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Design Analysis Cover Sheet

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1. PURPOSE

The objective of this analysis is to explore the Advanced Uncanistered Fuel (AUCF) Design waste package (WP) resistance to a seismic input at different levels of degradation. This analysis will also be used to determine the minimum thicknesses of various WP components required to withstand a seismic input in the geologic repository. The purpose of this analysis is to document the models and methods used in the calculations. The results of this analysis are not intended to show direct compliance with any design requirements.

2. QUALITY ASSURANCE

The Quality Assurance (QA) program applies to this analysis. The work reported in this document is part of the preliminary design structural analysis that will eventually support the License Application Design phase. This activity, when appropriately confirmed, can affect the proper functioning of the Mined Geologic Disposal System (MGDS) waste package; the waste package has been identified as an MGDS Q-List item important to safety and waste isolation (pp. 5, 16, Ref. 5.1). The waste package is on the Q-List by direct inclusion by the Department of Energy (DOE); a QAP-2-3 evaluation has yet to be conducted. The work performed for this analysis is covered by a Waste Package Development (WPD) QAP-2-0 work control Activity Evaluation entitled "Perform Criticality, Thermal, Structural, and Shielding Analyses" (Ref. 5.2). The QAP-2-0 evaluation determined that such activities are subject to Quality Assurance Requirements and Description (QARD) (Ref. 5.3) controls. Applicable procedural controls are listed in the activity evaluation.

All design inputs which are identified in this document are for preliminary or conceptual design and, excluding codes and standards, shall be treated as unqualified data; these design inputs will require subsequent qualification (or superseding inputs) as the waste package design proceeds. This document will not directly support any construction, fabrication, or procurement activity and therefore is not required to be procedurally controlled as TBV (to be verified). In addition, the inputs associated with this analysis are not required to be procedurally controlled as TBV. However, use of any data from this analysis for input into documents supporting construction, fabrication, or procurement is required to be controlled as TBV in accordance with the appropriate procedures.

3. METHOD

A spectrum analysis finite-element solution of the seismic problem was introduced by making use of the commercially available ANSYS finite element code. After the finite-element model was constructed, a modal solution was obtained to determine the natural frequencies and mode shapes of the geometry. The results of the modal analysis were then used in a response-spectrum analysis. In the response spectrum analysis, the seismic loads were applied to the model to determine stresses, strains, and deflections.

4. DESIGN INPUTS

All design inputs are for conceptual or preliminary designs; these design inputs, excluding codes and standards, will require subsequent qualification (or superseding inputs) as the waste package design proceeds to the final design.

4.1 Design Parameters

4.1.1. Dimensions

A three-dimensional finite-element model of the 21 Pressurized Water Reactor (PWR) AUCF WP was developed using dimensions taken from sketches generated by WPD.

Outer Barrier, Outer Diameter = 1.6619 m (Attachment XXXIX-1)
Outer Barrier, Skirt Inner Diameter = 1.5419 m (Attachment XXXIX-1)
Outer Barrier, Inner Diameter = 1.4619 m (Attachment XXXIX-1)
Outer Barrier, Skirt Height = 0.225 m (Attachment XXXIX-1)
Outer Barrier Lid, Thickness = 0.110 m (Attachment XXXIX-2)
Inner Barrier, Outer Diameter = 1.4619 m (Attachment XXXIX-3)
Inner Barrier, Inner Diameter = 1.4219 m (Attachment XXXIX-3)
Inner Barrier Lid, Thickness = 0.025 m (Attachment XXXIX-4)
Inner Barrier Length = 4.635 m (Attachment XXXIX-3)
Package Length = 5.335 m (Attachment XXXIX-1)
Tube Thickness = 0.005 m (Attachment XXXIX-5)
Outer Tube Width = 0.2385 m (Attachment XXXIX-5)
Tube Length = 4.575 m (Attachment XXXIX-5)
Criticality Control Plate Thickness = 0.007 m (Attachments XXXIX-6, XXXIX-7, and XXXIX-8)
Corner Guide Thickness = 0.010 m (Attachment XXXIX-9)
Side Guide Thickness = 0.010 m (Attachments XXXIX-10 and XXXIX-11)

4.1.2. Materials

The materials used in the manufacture of the waste package components are taken from the sketches generated by WPD.

Outer Barrier: A 516 Grade 70 Carbon Steel (Ref. 5.4)
Outer Barrier Lids: A 516 Grade 70 Carbon Steel (Ref. 5.4)
Inner Barrier: Alloy 625 (Ref. 5.4)
Inner Barrier Lids: Alloy 625 (Ref. 5.4)
Tube: A 516 Grade 70 Carbon Steel (Ref. 5.4)
Criticality Control Plates: 316B6A Stainless Steel Boron (Ref. 5.4)
Corner Guide: A 516 Grade 70 Carbon Steel (Ref. 5.4)

Side Guide: A 516 Grade 70 Carbon Steel (Ref. 5.4)

4.1.3. Material Properties

The material properties listed in this section are based on the assumption that the temperature of all waste package components is ambient temperature, 20°C, see Assumption 4.3.1.

ASTM A 516 carbon steel (grade 70) (outer barrier material):
Density = 8131 kg/m^3 (Ref. 5.5, p. 670)
Poisson's ratio = 0.3 (Ref. 5.6, p. 374) (see Assumption 4.3.2)
Modulus of elasticity = 206 GPa (calculated from English Unit, 30*10^6 psi * 6895*10^{-9} GPa/psi) (Ref. 5.6, p. 374) (see Assumption 4.3.2)
Tensile Strength = 485 MPa (Ref. 5.7) (see Assumption 4.3.3)
Yield strength = 260 MPa (Ref. 5.7)
Elongation % in 2 in. = 21 (Ref. 5.7)
Design stress intensity = 23.3 ksi = 161 MPa (Ref. 5.11, Table 2A, p. 300)

Alloy 625 (inner barrier material):
Density = 8442 kg/m^3 (Ref. 5.8)
Poisson's ratio = 0.278 (Ref. 5.9, p.143)
Modulus of elasticity = 208 GPa (Ref. 5.9, p.143)
Tensile Strength = 758 MPa (Ref. 5.8)
Yield strength = 379 MPa (Ref. 5.8)
Elongation % in 2 in. = 30 (Ref. 5.8)
Design stress intensity = 36.6 ksi = 252 MPa (Ref. 5.11, Table 2B, p. 408)

316B6A (316L Stainless Steel properties assumed, see Assumption 4.3.4) (structural members of the basket assembly):
Density = 7953 kg/m^3 (Ref. 5.10)
Poisson's ratio = 0.298 (Ref. 5.9, p. 755) (Assumption 4.3.5)
Modulus of elasticity = 195 GPa (Ref. 5.11, Table TM-1)
Tensile Strength = 482 MPa (70 ksi) (Ref. 5.10)
Yield strength = 172 MPa (25 ksi) (Ref. 5.10)
Elongation % in 2 in. = 40 (Ref. 5.10)
Design stress intensity = 16.7 ksi = 115 MPa (Ref. 5.11, Table 2A, p. 340)

4.1.4. Spent Nuclear Fuel Load

One PWR fuel assembly: 1720 lbs (780 kg), Ref. 5.12.

4.1.5. Backfill Load Inputs

Rock (TSw2) density = 2297 kg/m^3 (Ref. 5.22)

Rock Porosity = 12.1%, (Ref. 5.15, Assumption Identifier TDSS 012)
Backfill Porosity = 25% minimum, (see Attachment XXXVII, p. 3-15 and Assumption 4.3.14)
Backfill thickness perpendicular to slope of backfill surface = 0.6 m (Attachment XXXVI, Assumption 4.3.12)
Slope of backfill surface = 30° (see Assumption 4.3.12)

4.1.6. Seismic Input

The seismic loads were applied as acceleration loads at supports. In the response-spectrum analysis, the seismic loads were applied to the model to determine stresses, strains and deflections. The input to the response spectrum is in the form of a table of acceleration versus frequency, thus making it a frequency-domain solution. The acceleration of the waste package in the y-direction is selected as the type of spectrum for the seismic analysis and a constant peak ground acceleration (PGA) of 0.66g is used for a frequency range from 0.1 Hz to 100 Hz (Ref. 5.13, Assumption 4.3.6). The first eight mode shapes and corresponding natural frequencies fall into the frequency range and are used in this analysis. The reason for selecting this frequency range is to characterize the waste package response by including a sufficient number of modes in the solution phase. Using a large number of modes provides a more accurate solution. It is verified from the mode combination files of each finite-element solution (Attachments XIV, XVIII, and XXII) that the first six modes of the WP have the largest scale factors for their contributions to the spectrum solution, so using eight modes is more than adequate. The subsequent modes of the WP have no significant effect in the solution.

4.1.7. Degradation Products Inputs

Atomic Weights:

Fe	55.85 grams/mole	(Ref. 5.25)
O	16.00 grams/mole	(Ref. 5.25)
H	1.01 grams/mole	(Ref. 5.25)

4.2 Criteria

The following criteria are directly applicable to the design subject; however, it is not the intent of these analyses to show direct compliance with the following requirements from the Engineered Barrier Design Requirements Document (EBDRD) (Ref. 5.14):

4.2.1 "Packages for SNF and HLW shall be designed so that the in situ chemical, physical, and nuclear properties of the waste package and its interactions with the emplacement environment do not compromise the function of the waste packages or the performance of the underground facility or the geologic setting."

[EBDRD 3.7.1.A]

With regard to Requirement 3.7.1.A, the analyses performed in support of this document

examine the physical properties of the WP and its ability to function properly in the emplacement environment under seismic loads as it degrades. This requirement is addressed throughout the document.

4.2.2 "The design of waste packages shall include, but not be limited to, consideration of the following factors: solubility, oxidation/reduction reactions, corrosion, hydriding, gas generation, thermal effects, mechanical strength, mechanical stress, radiolysis, radiation damage, radionuclide retardation, leaching, fire and explosion hazards, thermal loads, and synergistic interactions."

[EBDRD 3.7.1.B]

Requirement 3.7.1.B items addressed in this design analysis are considerations of corrosion, mechanical strength, and mechanical stress. The purpose of this document is to report the results of structural analyses while taking into account the effects of corrosion. These issues are addressed throughout the document.

4.2.3 "The waste package shall contribute to limiting the dispersal of radioactive waste materials in the event of accidents or other dynamic effects."

[EBDRD 3.7.1.H]

The dynamic effects of the seismic loading on the WP are analyzed and addressed throughout this document.

4.2.4 "Seismic loads (TBD) shall not decrease the postclosure performance of the waste form."

[EBDRD 3.7.1.1.G]

The seismic analysis of the WP is performed in this document in order to determine the performance of the WP subjected to seismic loads. This requirement is addressed throughout the document.

4.2.5 "The container shall contain the radioactive waste materials during all normal handling and emplacement operations and, in the event of accidents or other dynamic effects, contribute to limiting dispersal of the waste. The container shall also have the mechanical integrity to sustain routine handling and transportation loads (TBD)."

[EBDRD 3.7.1.2.A]

The requirement 3.7.1.2.A items which are addressed are that the waste package shall contribute to limiting dispersal of waste in the event of accidents or dynamic effects. These requirements are addressed throughout the document.

4.2.6 "The container shall contribute (TBD) to controlling the release of radionuclides during the period of isolation."

[EBDRD 3.7.1.2.C]

The WP barriers analyses performed in this document aid in determining the degree to which the container will contribute to controlling the release of radionuclides during the period of isolation. This requirement is addressed throughout the document.

4.2.7 "The container shall be designed so that neither its in situ chemical, physical and nuclear properties, nor its interactions with the waste form and the emplacement environment, compromise the function of the waste package or the performance of the natural barriers or engineered barriers."

[EBDRD 3.7.1.2.G]

With regard to Requirement 3.7.1.2.G, the analyses performed in support of this document examine the physical properties of the WP and its ability to function properly in the emplacement environment as it degrades. This requirement is addressed throughout the document.

4.2.8 "The internal structure of the waste package shall be configured to accommodate the spent fuel waste form, provide mechanical stability of the waste form, and facilitate loading of the waste form into the waste package."

[EBDRD 3.7.1.3.B]

The internal structure is analyzed in this analysis to determine how much structural integrity it will provide to the waste as the basket components degrade. This requirement is addressed throughout the document.

The notation "TBD" in EBDRD requirements 3.7.1.1.G, 3.7.1.2.A, and 3.7.1.2.C will not be carried to the conclusions of this analysis based on the rationale that the conclusions derived by this analysis are for conceptual or preliminary design that will not be used as input into documents supporting construction, fabrication, or procurement.

4.3 Assumptions

In the course of developing this document, several assumptions were made regarding the seismic analysis of the waste package. These assumptions along with the assumptions contained in the Controlled Design Assumptions (CDA) Document (Ref. 5.15) (TBV-221-DD) are identified below. Documents which use data from this document as input must carry this TBV forward if they are developed in support of construction, fabrication, or procurement.

A review of the CDA identified the following assumptions (Ref. 5.15):

Assumption Identifier: Key 011 **Subject:** Horizontal In-Drift Emplacement

Waste packages will be emplaced in-drift in a horizontal mode.

Assumption Identifier: Key 046 **Subject:** Backfill in Emplacement Drifts

Current design assumes no backfill in emplacement drifts. Options for backfill will be considered based on ongoing and future backfill studies.

Assumption Identifier: EBDRD 3.7.1.1.G **Subject:** Post Closure Seismic Loads on Waste Package

Waste package seismic design for postclosure (through the substantially complete containment phase) performance shall be compatible with Design Basis Earthquake for surface and subsurface repository. Potential Repository peak accelerations for design are currently estimated at 0.75 g for surface and 0.4 g for subsurface.

Assumption Identifier: EBDRD 3.7.1.2.C **Subject:** Controlled Release During Period of Isolation

The container shall contribute to controlling the release rate of radionuclides during the period of isolation.

Assumption Identifier: TDSS 012

Porosity of intact rock - TSw2: 0.121

All of the following assumptions are for conceptual or preliminary designs; all of these assumptions will require qualification/confirmation as the waste package design proceeds.

4.3.1 Levels of degradation have not been related to the time at which they will occur, therefore, the temperatures of waste package components at various levels of degradation cannot be specified. For this reason, room temperature (20°C) material properties are used in these analyses. The impact of using room temperature material properties is small because while allowable stresses would decrease with increasing temperature, stress results would also decrease due to the decrease in the elastic modulus. Therefore, for this initial set of calculations, use of room temperature properties is adequate. This Assumption is used in Section 4.1.3.

4.3.2 The elastic modulus of cast carbon steel is assumed for A 516 carbon steel. Since the physical properties of wrought steel are generally similar to those of cast carbon steel, the elastic modulus and Poisson's ratio of cast carbon steel can be used for A 516 carbon steel (Ref. 5.6). This assumption is used in Section 4.1.3.

4.3.3 The lower limit of the given ultimate tensile strength range (Ref. 5.7) is used in this analysis. This is a conservative assumption and used in Section 4.1.3.

4.3.4 Material properties of 316L stainless steel are assumed to apply for 316B6A stainless steel-boron. 316L stainless steel is the closest material for which properties are available. The use of 316L stainless steel properties in place of 316B6A properties is also based on the observation that for the material properties which are used in the finite-element analysis, 304B6A properties are essentially the same as those for 304L stainless steel (Refs. 5.11 and 5.24). This assumption is used in Section 4.1.3.

4.3.5 Because Poisson's ratio for 316L stainless steel was unavailable, and because of the similarities between 316L stainless steel and 316 stainless steel, Poisson's ratio for 316 stainless steel is assumed to apply for 316L stainless steel and therefore for 316B6A. This assumption is used in Section 4.1.3.

4.3.6 The seismic design values for peak ground acceleration are given in Table 2 on page 13 of the document "Seismic Design Inputs for the Exploratory Studies Facility at Yucca Mountain" (Ref. 5.13). The ground motion reduction factors as a function of depth for ESF Design are also provided in Table 3 on page 17 of the same document. Instead of using the reduction factors for changing depth, the subsurface peak ground acceleration is conservatively assumed to be 0.66*g*. The frequency range of seismic input is also selected from a recommended design spectrum from 0.1 Hz to 100 Hz in Figure C-18 on page C-26. It should be noted that the PGA value of 0.66*g* is higher than the 0.4*g* PGA currently specified as the design basis earthquake for the WP in CDA Assumption EBDRD 3.7.1.1.G, which was based on an earlier recommendation for ESF design (Ref. 5.15). This assumption is used in Section 4.1.6.

4.3.7 The WP is symmetric about a plane that runs along the longitudinal axis. Assuming that one end of the WP with the gap between the inner barrier lid and the basket assembly also exists at the other end, the WP is also symmetric along the lateral axis. This is a conservative assumption and used in Section 7.2.

4.3.8 The outer barrier is assumed to be degraded completely prior to any pitting on the inner barrier. Degradation of the basket assembly does not begin until there is full penetration of the inner barrier material due to degradation. This can be assumed to occur at some intermediate level of degradation of the inner barrier because degradation does not necessarily occur as general thinning. Degradation of the basket assembly is treated as if the carbon steel tubes and an equivalent thickness of the guides will degrade prior to the beginning of degradation of the stainless steel-boron plates. Therefore, no structural credit is taken for the tubes although their masses are incorporated into the SS-B plates providing a conservative approach for analysis. This assumption is used in Section 7.2.

4.3.9 The weight of the degradation products is assumed to be the same as the weight of the original materials. The maximum stress is obtained at a location between the inner barrier, inner lid, and upper side guide (see Figure I-10). The magnitude of stress in this region, where the failure is observed in the guides, is an order of magnitude higher than

the rest of the WP. An increase in the basket load does not cause an increase in the stress magnitudes in this region since upper parts of the WP do not see loads due to weights on the basket assembly. In fact, the results of a separate ANSYS run showed that the stress magnitudes are lower when degradation product masses are included in the finite-element solution (see Section 8). Thus, this assumption does not have a significant effect in the results. This assumption is used in Section 7.2.

4.3.10 One of the assumptions in the finite-element model is that the material properties and displacement solution to the problem are linear. Because of the complex nature of spectrum analysis, the ANSYS code allows only linear solutions to this type of analysis. Therefore, an elastic solution is obtained and allowable material stresses are based on the failure criteria given in Section 7.1. This assumption is used in Section 7.2.

4.3.11 There is no structural damping in the materials used for this simulation. Attenuation of stress waves is not of interest because the failure criteria are based solely on the comparison of maximum stress with the allowable stress. However, absence of structural damping also provides conservative results to the FEA since the peak stress magnitudes will be larger. This assumption is used in Section 7.2.

4.3.12 Concept sketches indicate that the backfill surface will peak above the axis of the waste package and slope off to the sides. The perpendicular distance from the surface of the WP to the surface of the backfill is assumed from the sketch to be 0.6 m. The slope of the surface is assumed to be 30° (Attachment XXXVI). This assumption is used in Section 7.4.

4.3.13 The distance from the WP surface to the peak is calculated as 0.82 m in Section 7.4. This thickness of backfill is assumed to cover the entire waste package. Since the amount of backfill is actually less than this value, this assumption is conservative and it is used in Section 7.4.

4.3.14 The porosity of backfill is assumed to be 25%. This is based on the minimum value for the range given in Attachment XXXVII for porosities obtained in large scale tests. This assumption is used in Section 7.4.

4.3.15 Based on the velocity histories of Little Skull Mountain aftershock and a Rock Valley earthquake recorded at Midway Valley, the time duration for a typical seismic activity near the Yucca Mountain Site is assumed to be 50 sec. (Ref. 5.13, p. B-22). This assumption is used in Section 7.6.

4.3.16 The ANSYS finite-element solution to seismic problems involves a linear spectrum analysis. Thus, the secondary stresses caused by temperature differences are not considered in this analysis. This assumption is used in Section 7.6.

4.3.17 Two unyielding waste package supports were assumed to be positioned symmetrically from the longitudinal center of the waste package leaving an unsupported span equal to approximately half the length of the basket assembly. The use of two supports is assumed because the use of more supports would require precise leveling to avoid point loads on the WP. The support spacing is assumed because keeping the supports in from the ends reduces the unsupported span and because it will make emplacement easier by reducing the required precision. Symmetry is assumed so that a quarter symmetry model may be used. Because the WP supports have not yet been designed, structural information about them is unavailable, therefore, they have been conservatively assumed to be perfectly rigid. This assumption is used in Section 7.2.

Based on the rationale that the conclusions derived by this analysis are for conceptual or preliminary design that will not be used as input into documents supporting construction, fabrication, or procurement, TBV-221-DD which is carried by Ref. 5.15 (Assumption 4.3.6) will not be carried to the conclusions of this analysis.

4.4 Codes and Standards

The use of codes and standards for the design of the waste package is restricted to being a source for material properties, specifically for A 516 Carbon Steel, Alloy 625, and 316L Stainless Steel (American Society for Testing and Materials (ASTM)), and for providing the criteria for the failure analysis of containment barriers (ASME Boiler and Pressure Vessel Code). The specific codes and standards used, along with identification of all other sources used regarding material properties, are listed in Section 5.

5. REFERENCES

5.1 *Q-List*, YMP/90-55Q, REV 3, Yucca Mountain Site Characterization Project.

5.2 *Perform Criticality, Thermal, Structural, and Shielding Analyses*, Document Identifier (DI) Number: BB0000000-01717-2200-00025 REV 02, Civilian Radioactive Waste Management System (CRWMS) Management and Operating Contractor (M&O).

5.3 *Quality Assurance Requirements and Description*, DOE/RW-0333P, Rev 5, U.S. Department of Energy (DOE) Office of Civilian Radioactive Waste Management (OCRWM).

5.4 *Material of 21 PWR AUCF Waste Container*, H. Wang, Interoffice Correspondence, LV.WP.HW.03/96.059, March 13, 1996, CRWMS, M&O.

5.5 *Introduction to Heat Transfer*, F.P. Incropera and D.P. Dewitt, John Wiley and Sons Publisher, New York, NY, 1985.

5.6 *Metals Handbook Tenth Edition, Volume 1, Properties and Selection: Irons, Steels, and High-Performance Alloys*, American Society for Metals, Metals Park, OH, 1990.

5.7 *Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate-and Lower-Temperature Service*, ASTM Designation: A 516 / A 516M - 90, American Society for Testing and Materials.

5.8 *Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) Plate, Sheet, and Strip*, ASTM Designation: B 443 - 93, American Society for Testing and Materials.

5.9 *Metals Handbook Ninth Edition, Volume 3, Properties and Selection: Stainless Steels, Tool Materials and Special-Purpose Metals*, American Society for Metals, Metals Park, OH, 1980.

5.10 *Structural Alloys Handbook*, Vol. 2, 1992 Edition, John M. Holt, Harold Mindlin, and C.Y. Ho, Cindas / Purdue University, 1992.

5.11 *1992 ASME Boiler and Pressure Vessel Code*, Section II, American Society of Mechanical Engineers, 1992.

5.12 *Multi-Purpose Canister Issue Evaluation,* Concurrence by MPC Implementation Team, Issue No. MPC-011, July 20, 1993, CRWMS/M&O.

5.13 *Seismic Design Inputs for the Exploratory Studies Facility at Yucca Mountain,* Technical Report, Document No. BAB000000-01717-5705-00001 REV 02, CRWMS/M&O.

5.14 *Engineered Barrier Design Requirements Document*, YMP/CM-0024 Rev. 0, ICN 1, Yucca Mountain Site Characterization Project.

5.15 *Controlled Design Assumptions Document*, DI#: B00000000-01717-4600-00032 REV 02, CRWMS M&O. (TBV-221-DD)

5.16 *Software Qualification Report for ANSYS Version 5.1HP* (CSCI: 30003 V5.1HP), DI Number: 30003-2006 REV 01, CRWMS M&O.

5.17 *Life Cycle Plan for ANSYS Version 5.1HP* (CSCI: 30003 V5.1HP), DI Number: 30003-2007 REV 01, CRWMS M&O.

5.18 *1992 ASME Boiler and Pressure Vessel Code*, Section III, Division 1, Subsection NG, American Society of Mechanical Engineers, 1992.

5.19 *1992 ASME Boiler and Pressure Vessel Code*, Section III, Division 1, Subsection NB, American Society of Mechanical Engineers, 1992.

5.20 *Mechanical Engineering Design*, First Metric Edition, J. E. Shigley, McGraw-Hill Book Company, New York, NY, 1986.

5.21 *ANSYS User's Manual for Revision 5.1, Volume III, Elements*, DN-R300:51-3 Upd0 2nd Revision, Swanson Analysis Systems Inc., September 30, 1994.

5.22 *Reference Information Base*, YMP/93-02 Rev. 3, Chapter 1, Section 1.1322 Item a, 1.1325 Item a, Yucca Mountain Site Characterization Project.

5.23 *1992 ASME Boiler and Pressure Vessel Code*, Section III, Division 1, Appendix I, American Society of Mechanical Engineers, 1992.

5.24 *1992 ASME Boiler and Pressure Vessel Code*, Code Case N-510, American Society of Mechanical Engineers, 1992.

5.25 *Nuclides and Isotopes*, Fourteenth Edition, General Electric Company, Nuclear Energy Operations, San Jose, CA, 1989.

5.26 *1992 ASME Boiler and Pressure Vessel Code*, Section III, Division 1, Appendix F, American Society of Mechanical Engineers, 1992.

6. USE OF COMPUTER SOFTWARE

The FEA computer code used for this analysis is ANSYS version (V) 5.1 which is identified with the Computer Software Configuration Item (CSCI) 30003 V5.1HP and was obtained from Software Configuration Management in accordance with appropriate procedures. ANSYS is a commercially available finite-element analysis code and is appropriate for structural analysis of waste packages as performed in this analysis. The analyses using the ANSYS software were executed on a Hewlett-Packard 9000 Series 735 workstation. The software qualification of the ANSYS software, including problems of the type analyzed in this report, is summarized in the Software Qualification Report for ANSYS Version 5.1HP (Ref. 5.16). The ANSYS evaluations performed for this design are fully within the range of the validation performed for the ANSYS V5.1 code. Access to and use of the code for the analysis is granted and performed in accordance with the Life Cycle Plan for ANSYS Version 5.1HP (Ref. 5.17) and the QAP-SI series procedures.

The input/output files, figures, and results for all computer analyses performed in this report are presented in Attachments I through XXXV, XXXVIII, and XL through XLVII.

7. DESIGN ANALYSIS

7.1 Failure Criteria

The criteria for the failure analysis of containment barriers are obtained from the ASME Boiler and Pressure Vessel Code. S_u and S_m are defined as the ultimate tensile strength and design stress intensity values of the materials, respectively. The failure criteria for the elastic analysis are described in the ASME Boiler and Pressure Vessel Code as follows (Ref. 5.26, Article F-1331.1 and Ref. 5.19, Article NB-3225):

The general primary membrane stress intensity shall not exceed the lesser of 2.4 S_m and 0.7S_u, and the primary membrane plus primary bending stress intensity (P_b) shall not exceed 150% of the limit for general primary membrane stress intensity, P_m. Therefore,

Maximum Membrane Stress < 0.7 S_u or 2.4 S_m
Maximum Membrane + Bending Stress < 1.05 S_u or 3.6 S_m

will be satisfied for all materials in the WP.

S_m values for selected materials are given in the ASME Code, Section II, Tables 2A and 2B, Ref. 5.11. For the analyses performed, the temperature used is room temperature (20°C) (Assumption 4.3.1). Therefore, the limits are as follows:

Table 7-1. Design Stresses (Room Temperature)

Material	S_m	Page of Ref. 5.11
A 516 Grade 70	23.3 ksi (161 MPa)	Table 2A, p. 300
Alloy 625	36.6 ksi (252 MPa)	Table 2B, p. 408
316B6A (316L)	16.7 ksi (115 MPa)	Table 2A, p. 340

Table 7-2 is provided below in order to summarize the failure criteria obtained from the ASME Boiler and Pressure Vessel Code.

Table 7-2. Calculated Allowable Stress Limits ($S_{allowable}$) (Room Temperature)

Material	S_m	S_u	$2.4S_m$	$0.7S_u$	Limit for P_m	Limit for P_m+P_b
A 516 Grade 70	161	485	386	340	340	510
Alloy 625	252	758	605	531	531	797
316B6A (316L)	115	482	276	337	276	414

* All units are in MPa

The margin of safety for the stress magnitudes is defined as follows (Ref. 5.20, p. 11):
margin of safety = $(S_{allowable} / \sigma) - 1$
where σ is the maximum stress on the containment barriers.

7.2 Advanced Uncanistered Fuel Waste Package Finite-Element Model Description

The ANSYS 5.1 finite-element analysis code is used for the seismic analysis of the WP under various degrees of material degradation. The models developed for this analysis are one-quarter and one-half symmetry three-dimensional finite-element models.

The analysis incorporates the waste package outer barrier and lids, inner barrier and lids, basket tubes, criticality control plates, side guides, and corner guides. Material specifications of each WP component are defined by their individual property tables. The component materials are as stipulated in Section 4.1.2.

The waste package model is a three-dimensional solid constructed of brick elements (SOLID45 elements, Ref. 5.21). The waste package is assumed to be resting on two pedestal supports. The supports are placed inside of the lids, leaving a span approximately half of the length of the outer barrier, excluding the skirts (Assumption 4.3.17). The solutions were run with backfill.

The WP is symmetric about a plane that runs along the longitudinal axis. Assuming that one end of the WP with the gap between the inner barrier lid and the basket assembly also exists at the other end (Assumption 4.3.7), the WP is also symmetric along the lateral axis. Therefore, a one-quarter WP model can be developed using the symmetry boundary conditions (Figure I-1 in Attachment I). Taking advantage of the symmetry reduces the model size, allowing more detail in the part that is modeled. However, even with the symmetric model, the element mesh must remain somewhat coarse in order to reduce solution times and output file sizes. Therefore, some other simplifications have been made to the model.

- For the present WP conceptual designs, the outer and inner barriers are fabricated as one piece (the inner barrier clad to the outer barrier). Thus, there is no need for contact

elements between the inner and outer barriers. It is best to avoid the use of contact elements wherever possible to prevent convergence problems and to reduce the model size and run times. While the inner and outer barriers are treated as contiguous, there is an element border between the inner and outer barrier and the appropriate material properties are used for each barrier, see Sections 4.1.2 and 4.1.3.

- The basket components are modeled as a solid piece and also rigidly connected to the inner barrier. Since nonlinear contact elements cannot be used in a spectrum analysis, this simplification is necessary for the finite-element solution.

- The backfill load is included in the model by increasing the density of the outermost barrier for that particular solution (outer barrier when present, inner barrier for cases where the outer barrier has completely degraded). Since the additional backfill load is included in the mass of the containment barriers, this analysis is conservative compared to an analysis performed without the backfill load.

The pressure of SNF assemblies cannot be incorporatred into the modal or response spectrum analyses in terms of external pressure since the natural frequency and mode shapes are not dependent on external forces applied to the system. Therefore, the spent fuel assembly mass is added into the basket assembly components for each seismic finite-element solution.

The seismic loads were applied as acceleration loads at the emplacement supports. After the model was constructed, a modal solution was obtained to find the natural frequencies and mode shapes of the geometry. The results of the modal analysis were then used in a response-spectrum analysis. In the response-spectrum analysis, the seismic loads were applied to the model to determine stresses, strains and deflections. The input to the response spectrum is in the form of a table of acceleration versus frequency, thus making it a frequency-domain solution. A single-point response-spectrum is used, meaning that all supports of the model will experience the same ground movement. Displacement constraints at the emplacement support locations serve as the points of excitation in the vertical y-direction.

A large amplitude horizontal component of the seismic input would cause the WP to move on the emplacement supports along the axis of the WP. Similarly, a lateral movement on the horizontal plane would cause the WP to rotate with respect to the point of contact with the emplacement support and, therefore, would not result in a significant change in the stress distribution over the WP. The vertical displacement of the pedestals, however, causes bending and local deformation in the WP. Therefore, the vertical component of the acceleration is selected to be the only seismic input used in the finite-element analysis.

The outer barrier is assumed to be degraded completely prior to any pitting on the inner barrier. Degradation of the basket assembly does not begin until there is full penetration of the inner barrier material due to degradation. This can be assumed to occur at some intermediate level of degradation of the inner barrier because degradation does not necessarily occur as general

thinning. Degradation of the basket assembly is, therefore, treated as if the carbon steel tubes and an equivalent thickness of the guides will degrade prior to the beginning of degradation of the stainless steel-boron plates (Assumption 4.3.8). Therefore, no structural credit is taken for the tubes although their masses are incorporated into the SS-B plates providing a conservative approach for analysis.

The weight of the degradation products is assumed to be the same as the weight of the original materials (Assumption 4.3.9).

One of the assumptions in the finite-element model is that the material properties and displacement solution to the problem are linear (Assumption 4.3.10). Because of the complex nature of spectrum analysis, the ANSYS code allows only linear solution to this type of analysis. Therefore, an elastic solution is obtained and allowable material stresses are based on the failure criteria given in Section 7.1.

There is no damping specified in this finite-element analysis solution. Therefore, the results are conservative since the stress magnitudes will be larger due to the absence of damping in the waste package structure (Assumption 4.3.11).

The response spectrum includes the first eight mode shapes and corresponding natural frequencies. The mode shapes were selected to characterize the waste package response by including a sufficient number of modes in the solution phase. Eight modes are more than enough to provide an accurate solution, see Section 4.1.6.

The response spectrum curve is defined by the frequency range versus spectral value on the horizontal and vertical axes, respectively. The acceleration of the waste package in the y-direction is selected as the type of spectrum for the seismic analysis. Seismic loading with a peak ground acceleration of 0.66*g* in the vertical direction is used for the seismic acceleration input to the finite-element model (see Section 4.1.6).

The output from the finite-element solution consists of the participation factor table and the mode combination file. The participation factor is a combination of the normalized eigenvector, mass matrix, and a vector describing the excitation direction. The participation factor table lists the participation factors, mode coefficients, and the mass distribution for each mode. The mode coefficients are used to multiply the mode shapes to obtain the maximum response of each mode.

The final sequence of the solution process involves the combination of the maximum modal responses as specified by the mode combination file of ANSYS to calculate the overall response of the structure. The overall response consists of the overall displacements, stresses, strains, and reaction forces.

7.3 Calculation of the Mass Increase Due to Corrosion

Carbon steel contains primarily Iron, Fe. Iron corrodes to form a variety of oxides. The oxide which cause the greatest mass increase is $Fe(OH)_2$. The atomic weights of these elements are:

Fe	55.85 grams/mole	(see Section 4.1.7)
O	16.00 grams/mole	(see Section 4.1.7)
H	1.01 grams/mole	(see Section 4.1.7)

The molecular mass of $Fe(OH)_2$ is therefore:

$55.85 + 2\ (16.00 + 1.01) = 89.87$ grams/mole

The ratio of the molecular mass of $Fe(OH)_2$ to Fe is:

$89.87/55.85 = 1.61$

Thus, to account for the mass increase due to corrosion of iron, the mass of the corroded material must be multiplied by 1.61. This ratio is used in part of the calculations given in Sections 7.4 and 7.5.

7.4 Calculations to Adjust Barrier Densities to Include Backfill Mass

In order to determine the backfill mass above the waste packages, some assumptions have to be made. The first assumption is the depth of the backfill above the package. Concept sketches included as Attachment XXXVI indicate that the backfill surface will peak above the axis of the waste package and slope off to the sides. The perpendicular distance from the surface of the WP to the surface of the backfill is assumed from the sketch to be 0.6 m. The slope of the surface is assumed to be 30° (Attachment XXXVI, Assumption 4.3.12). The WP radius is 0.83095 m. Therefore, the minimum distance from the axis of the WP to the backfill surface is:

$$0.83095 + 0.60 = 1.43 \text{ m}$$

The distance to the peak is:

$$1.43/\cos(30°) = 1.65 \text{ m}$$

Thus, the distance from the WP surface to the peak is:

$$1.65 - 0.83095 = 0.82 \text{ m}$$

This thickness of backfill is assumed to cover the entire waste package (Assumption 4.3.13). The horizontal area over which this thickness applies depends on the level of degradation. For

no degradation of the barriers, the area is equal to the total waste package length times the outer barrier diameter. As the waste package corrodes, the area shrinks. The density of the backfill has been approximated based on rock density data, rock porosity data, and backfill porosity data.

The saturated density of TSw2 rock is 2297 kg/m^3, see Section 4.1.5.
Rock Porosity = 12.1%, (see Section 4.1.5)
Backfill Porosity = 25% minimum (see Section 4.1.5, Assumption 4.3.14)

The percentage of backfill that is solid rock is calculated as follows:

(1-0.25) / (1-0.121) = 0.85 or 85%

Backfill Density: (2297)(0.85) = 1952.45 kg/m^3

The following table contains the values to calculate the backfill mass at various levels of degradation using the following equations:

Volume = Depth x Length x Diameter
Mass = Volume x Density

The length of the WP can be found by subtracting the corrosion depth at each end from the length of the waste package. The corrosion depth at each end is determined by multiplying the percentage of corrosion by the original thickness of the outer barrier. Between 25% and 50% outer barrier corrosion, the skirts corrode completely and are subtracted from the length. At 100% outer barrier corrosion, the WP length is equal to the inner barrier length.

Table 7-3. Calculation of Backfill Masses Based on Level of Degradation

Level of Degradation	Depth of Backfill (m)	Length of WP (m)	Diameter of WP (m)	Volume (m^3)	Density (kg/m^3)	Backfill Mass (kg)
OB-0, IB-0	0.82	5.335	1.6619	7.27	1952.45	14,195
OB-100, IB-75	0.82	4.605	1.4319	5.41	1952.45	10,557
OB-100, IB-90	0.82	4.599	1.4259	5.38	1952.45	10,504

The original mass of the section to which the backfill mass is added is calculated below. The following variables and values are used in the following equations:

Table 7-4. Parameters Used in Backfill Mass Calculations

Variable	Value	Representation	Source
OBOR	0.83095 m	Outer barrier outer radius	Section 4.1.1
OBIR	0.73095 m	Outer barrier inner radius /Inner barrier outer radius	Section 4.1.1
OBSR	0.77095 m	Outer barrier skirt radius	Section 4.1.1
IBIR	0.71095 m	Inner barrier inner radius	Section 4.1.1
Angle	80.44 deg.	Encompassing angle of section to which backfill mass is added.	See calculation below
LENBOD	4.885 m	Length of WP excluding skirts	Section 4.1.1
LENTOT	4.635 m	Length of inner barrier	Section 4.1.1
$DENS_{ob}$	8131 kg/m^3	Density of outer barrier material	Section 4.1.1
$DENS_{ib}$	8442 kg/m^3	Density of inner barrier material	Section 4.1.1

Angle Calculation:

The encompassing angle is the angle between vertical and the contact point between the inner side of the B-guide and the inner barrier nearest to horizontal from the center of the waste package. This angle can be determined by finding the coordinates of the contact point. The coordinates are found by summing the component widths and thicknesses which are taken from Section 4.1.1.

x: 2.5(Tube Outer Width) + 2 (Criticality Control Plate Thickness) + (A-Guide Thickness) + (B-Guide Width) = 2.5(0.2385) + 2(0.007) + (0.010) + (0.0809)
= 0.701 m

Y: 0.5(Tube Outer Width) + 0.5(Criticality Control Plate Thickness) - 0.5(B-Guide Thickness) = 0.5(0.2385) + 0.5(0.007) - 0.5(0.010)
= 0.118 m

Ang = 90 - arctan(0.118/0.701) = 80.44 deg.

A_1 = Section Area of Skirt (The section is that contained by the Angle)
A_2 = Section Area of Outer Barrier excluding the Skirt
V_1 = Section Volume of A_1
V_2 = Section Volume of A_2

The adjusted density for the upper section (which is the portion of the barrier to which backfill mass will be added) of the outer barrier is calculated by adding the section mass with the backfill mass and outer barrier mass (one half for half symmetry is considered in the calculations, however, the same densities are used in the quarter model) and dividing the sum by the section volume.

Degradation Level: 0% Outer Barrier, 0% Inner Barrier

$A_1 = \pi(OBOR^2 - OBSR^2)(Angle/360)$
$A_1 = \pi(0.83095^2 - 0.77095^2)(80.44/360) = 0.06747\ m^2$

$V_1 = A_1 \times LENTOT = 0.06747 * 5.335 = 0.360\ m^3$

$A_2 = \pi(OBSR^2 - OBIR^2)(Angle/360)$
$A_2 = \pi(0.77095^2 - 0.73095^2)(80.44/360) = 0.04217\ m^2$

$V_2 = A_2 \times LENBOD = 0.04217 * 4.885 = 0.206\ m^3$

Section Volume = $V_1 + V_2 = 0.566\ m^3$

Section Mass = Section Volume x $DENS_{ob}$ = 4602 kg
Outer barrier mass = 4602 kg
Backfill mass = 14,195 kg
Adjusted Density = (OB mass + Backfill mass/2) / Section volume
Adjusted Density = (4602 + 14,195/2)/0.566 = 20,670 kg/m^3 (Attachment XXVIII, p. 3)

Level of Degradation: 100% Outer Barrier, 75% Inner Barrier

OB Section Area = $\pi(OBOR^2 - OBIR^2)(Angle/360)$
= $\pi(0.83095^2 - 0.73095^2)(80.44/360) = 0.10964\ m^2$

OB Section Volume = 0.10964 * (LENTOT-(2*0.015)) = 0.5049 m^3
OB Section Mass = Section Volume x $DENS_{ob}$ = (0.5049)(8131) = 4105 kg

IB Section Area = $\pi(OBIR^2 - IBIR^2)(Angle/360)$
IB Section Area = 0.02024 m^2
IB Section Volume = (0.02024)(4.635-(2*0.015)) = 0.09321 m^3
IB Section Mass = (0.09321)(8442) = 787 kg

Corroded IB Section Area = $\pi(0.71595^2 - 0.71095^2)(80.44/360)$ = 0.00501 m^2
Corroded IB Section Volume = (0.00501)(4.635-(2*0.015)) = 0.02307 m^3

IB Section Mass = 787 kg
OB Section Mass = 4105 kg
Backfill Mass = 10,557 kg
Adjusted Density = (787 + 4105 + 10,557/2)/0.02307 = 440,854 kg/m^3 (440,860 used)
(Attachment XI, p. 4)

Level of Degradation: 100% Outer Barrier, 90% Inner Barrier

OB Section Area = 0.10964 m^2 (constant)
OB Section Volume = (0.10964)(4.635 - (2*0.018)) = 0.5042 m^3
OB Section Mass = (0.5042)(8131) = 4100 kg

Scaled mass value for increase in the mass due to corrosion = 1.61 * 4100 = 6601 kg (see Section 7.3)

IB Section Area = 0.02024 m^2 (constant)
IB Section Volume = (0.02024)(4.635-(2*0.018)) = 0.09308 m^3
IB Section Mass = (0.09308)(8442) = 786 kg

Scaled mass value for increase in the mass due to corrosion = 786 + 8442 * 0.61 * (0.09308 - 0.00920) = 1218 kg

Corroded IB Section Area = $\pi((0.73095-0.018)^2 - 0.71095^2)(80.44/360)$ = 0.00200 m^2
Corroded IB Section Volume = (0.00200)(4.635-(2*0.018)) = 0.00920 m^3

Adjusted Density = (786 + 4100 + 10,504/2)/0.00920 = 1,101,957 kg/m^3 (1,101,960 used)
(Attachments XV, p. 4 and XIX, p. 4)

Adjusted density value for increase in the mass due to corrosion = (1218 + 6601 + 10504/2) / 0.00920 = 1,420,761 kg/m^3 (1,420,770 used)

7.5 Calculations to Adjust Basket Assembly Component Densities to Include SNF Assembly Load

Mass of one tube = $((0.2385)^2 - (0.2285)^2)*4.575*8131 = 173.72$ kg
Mass of one SNF assembly = (1720 lb)*(0.4536 kg/lb) = 780.19 kg

For the half symmetry finite-element model with original waste package dimensions, weight of the SNF assemblies is added to the weight of the basket assembly tubes by the following calculations:

Actual density of the tubes = 8131 kg/m^3 (Section 4.1.3)
Corresponding ANSYS calculated mass = 1824.11 kg (Attachment XXXVIII, p. 140)

Total mass of the tubes and SNF assemblies = (1824.11 + 780.19*21/2) = 10,016.105 kg

Adjusted density of SS-B plates = 8131 * 10016.105 / 1824.11 = 44646.96 kg/m^3 (Attachment XXVIII, p. 3)

For the quarter symmetry model of 100% degradation in the outer barrier, 75% in the inner barrier, 100% in the tubes, 50% in guides, and 0% in SS-B plates, the following adjustment is made in the mass of SS-B plates:

Total mass of the tube and SNF assembly to be added in the SS-B plates =
(173.72 + 780.19)*21 / 4 = 5008.03 kg

Actual density of SS-B plates = 7953 kg/m^3 (Section 4.1.3)
Corresponding ANSYS calculated mass = 491.306 kg (Attachment XXIII, p. 103)

Adjusted density of SS-B plates = 7953 * ((5008.03 + 491.306) / 491.306) = 89020.33 kg/m^3

The third case run with the 90% inner barrier degradation includes the same adjusted density value (Attachment XV, p. 3). However, the fourth finite-element solution includes 50% thickness of the SS-B plates, therefore, the density is doubled in order to account for the change in the total volume of plates (Attachment XIX, p. 3).

The second ANSYS run for 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation with increased mass due to corrosion products is performed by using following calculations:

Total mass of the tube and SNF assembly to be added in the SS-B plates = (173.72 * 1.61 + 780.19)*21 / 4 = 5564.4 kg
Adjusted density of SS-B plates = 7953 * (5564.4 + 491.306/2 + (491.306/2) * 0.61)) / 491.306 = ~~100,452.2 kg/m^3~~ (Attachment XLIII, p. 3) 96,475.71 kg/m^3 see note at the bottom of the page * Z.C. 06/14/96
Adjusted density of guides = 16262/2 + (16262/2) * 1.61 = 21221.91 kg/m^3 (Attachment XLIII, p. 3)

7.6 Calculations for the Fatigue Analysis of the WP

Due to the cyclic nature of the problem, a fatigue analysis is also performed to determine if the WP can withstand specified cyclic loads obtained from the seismic analysis. The allowable alternating stress is obtained from the ASME Code as follows:

Upper end of the frequency range used in analysis = 100 Hz (Attachment XV, p. 17)
Assumed time duration for the seismic input = 50 sec. (see Assumption 4.3.15)
Thus, number of cycles = 100*50 = 5000 cycles per seismic event

Using this number of cycles, from ASME Code, Fig. I-9.2.1 (Ref. 5.23), the allowable alternating stress for the Alloy 625 and 316B6A Stainless Steel Boron is determined as 75 ksi (517 MPa). The alternating stress allowable for A 516 Carbon Steel, however, is determined using Figure I-9.1 of the same Section of the ASME Code as 50 ksi (345 MPa).

The analysis for cyclic operation is described in articles NG-3222.4 (Ref. 5.18) and NB-3222.4 (Ref. 5.19) in such a way that one-half of the peak stress determined from the FEA is to be compared to the alternating stress allowables in order to determine the failure in the system due to cyclic loading. Table 7-5 summarizes these stress magnitudes and allowables. A comparison of these values shows that the load fluctuation is insignificant. In addition to this, the conditions stipulated in the same article related to the temperature difference effects are not evaluated in this document (see Assumption 4.3.16). Therefore, no analysis for cyclic service is required, and the peak stress limit discussed above has been satisfied by compliance with the applicable requirements of this ASME subsection.

* The result of this calculation is revised to 96,475.71 kg/m^3. The ANSYS run was performed to determine the effect of an increase in the mass of the waste package due to degradation products. A comparison of the stresses between the results of the finite-element models with and without increased mass showed that an increase in the mass results in lower stress magnitudes. The bounding results of the analyses are obtained from the analyses without the increased mass and are given in the results of the design analysis (see Section 8 and Assumption 4.3.9). Since 100,452.2 kg/m^3 is larger than 96,475.71 kg/m^3, the same conclusion can be made conservatively. Therefore, this change does not have any impact in the results of the design analysis.
Z.C. 06/14/96

Table 7-5. Stress Peaks and Allowables for Fatigue Analysis

WP Components	Percent Degradation	Peak Stress / 2 (MPa) (Attachment-page #)	Alternating Stress Allowables (MPa)
Outer Barrier	100%	N/A	N/A
Inner Barrier	90%	325 (V-1)	517
Tubes	100%	N/A	N/A
Guides	50%	175 (VI-1)	345
SS-B Plates	0%	11 (VII-1)	517

8. CONCLUSIONS

As identified in Sections 2.0 and 4.0, this analysis is based on unqualified/unconfirmed input data, and use of any data from this analysis for input into documents supporting construction, fabrication, or procurement is required to be controlled as TBV in accordance with the appropriate procedures.

The stress path for each finite-element model is defined including the node at which the stress intensity is maximum. This procedure is applied to the outer barrier, inner barrier, tubes, guides, and the criticality control plates; related postprocessing files are included in the Attachments. The resulting membrane and membrane plus bending stress magnitudes are presented in Table 8-1 for four different degradation levels in the WP with references to the Attachments.

The first eight mode shapes and corresponding natural frequencies of the WP are presented in Figures I-2 through I-9. It is verified from the mode combination files of each case run (Attachments XIV, XVIII, and XXII) that the first six modes of the WP generally have the largest scale factors for their contributions to the spectrum solution. Therefore, the subsequent modes of the WP have no significant effect in the solution.

The failure criteria were explained in Section 7.1. Thus, the maximum stresses from the ANSYS solution are compared to the stress allowables in order to determine the critical WP dimensions for different levels of degradation. Table 8-1 shows the maximum values of the membrane stress, membrane plus bending stress, and allowable stress magnitudes.

Input parameter calculations of a separate ANSYS run were given in Sections 7.3, 7.4, and 7.5. This analysis was performed to determine the effect of an increase in the mass of the WP due to degradation products. The fourth level of degradation given in Table 8-1 was used to obtain the maximum effect of degradation product mass on the results. A comparison of the stresses between the results of the finite-element models with and without increased mass showed that an increase in the mass results in lower stress magnitudes. As it is observed from Attachments XL, XLI, and XLII, the stress magnitudes are lower compared to the stresses obtained from Table 8-1, fourth column.

A comparison of allowable stresses with the maximum stresses shows that there is no failure in the material for the first three degradation levels of the outer barrier, inner barrier, tubes, and the criticality control plates. However, the fourth level of degradation by 50% thinning of the SS-B plates results in the failure of the side guide (see Table 8-1, fourth column). For the same degradation level, the margin of safety for the inner barrier is determined to be 34% in terms of the allowable membrane stress. It is concluded from the results in Table 8-1 that the failure of the side guide takes place before any failure is observed in the inner barrier. Therefore, allowable percent degradation levels of various WP components are obtained from the third degradation level which are presented in the same table.

The first column of the Table 8-1 gives the results of the FEA with no degradation in the WP. The reason for observing such small magnitudes of stresses in the WP is because of the full thicknesses of the inner and outer barriers and the resulting fact that none of the natural frequencies of this structure is in the frequency range that is critical for the WP (see Attachment XXVIII, p. 145). Therefore, these negligible stresses and very high margin of safety values are presented in this table for no degradation of the WP.

The third column of degradation level of Table 8-1 has been used to analyze the effects of seismic input and the location of maximum stress in the WP can be observed from Figure I-10. It is concluded from the same figure that the maximum spectrum response of the WP is obtained at a location between the inner barrier, inner lid, and upper side guide.

Attachment and page numbers of all stress magnitudes are provided in parentheses in Table 8-1. The margin of safety values were calculated according to the relation given in Section 7-1 and provided in the same table.

It is concluded from the seismic structural analysis of the WP that a WP with a degradation level of 100% in the outer barrier, 90% in the inner barrier, 100% in the tubes, 50% in the guides, and 0% in the SS-B plates (which have not begun to degrade significantly at this level) will not fail in any component when subjected to a seismic load of 0.66*g* peak ground acceleration. The results of fatigue analysis also show that there is no failure in the WP for a seismic input for a time duration of 50 seconds per seismic event (see Section 7.6). This is the maximum degradation level analyzed for which there was no failure in any WP component.

Table 8-1. Seismic Analysis Results

Barrier Analysis at Different Degradation Levels	Percent Degradation (General Thinning of Outer Barrier, Pitting of Inner Barrier). It is assumed that the outer barrier degrades completely prior to any pitting on the inner barrier. The numbers next to the stresses represent: (Attachment #-page #).			
Outer Barrier Degradation	0%	100%	100%	100%
Inner Barrier Degradation	0%	75%	90%	90%
Tube Degradation	0%	100%	100%	100%
Guide Degradation	0%	50%	50%	50%
SS-B Plate Degradation	0%	0%	0%	50%
Membrane Stress in Outer Barrier	3 (XXIV-1)	N/A	N/A	N/A
Membrane Stress Allowable in Outer Barrier Margin of Safety	340 112.33	N/A	N/A	N/A
Membrane Plus Bending Stress in Outer Barrier	5 (XXIV-1)	N/A	N/A	N/A
Membrane Plus Bending Stress Allowable in Outer Barrier Margin of Safety	510 101.00	N/A	N/A	N/A
Membrane Stress in Inner Barrier	3 (XV-1)	72 (II-1)	295 (V-1)	395 (VIII-1)
Membrane Stress Allowable in Inner Barrier Margin of safety	531 176.00	531 6.38	531 0.80	531 0.34
Membrane Plus Bending Stress in Inner Barrier	4 (XXV-1)	82 (II-1)	321 (V-1)	435 (VIII-1)
Membrane Plus Bending Stress Allowable in Inner Barrier Margin of safety	797 198.25	797 8.72	797 1.48	797 0.83
Membrane Stress in Guides	5 (XXVI-1)	68 (III-1)	293 (VI-1)	369 (IX-1)
Membrane Stress Allowable in Guides Margin of Safety	340 67.00	340 4.00	340 0.16	340 fails
Membrane Plus Bending Stress in Guides	6 (XXVI-1)	70 (III-1)	300 (VI-1)	376 (IX-1)
Membrane Plus Bending Stress Allowable in Guides Margin of safety	510 84.00	510 6.29	510 0.70	510 0.36
Membrane Stress in SS-B Plates	3 (XXVII-1)	15 (IV-1)	20 (VII-1)	46 (X-1)
Membrane Stress Allowable in SS-B Plates Margin of Safety	276 91.00	276 17.40	276 12.80	276 5.00
Membrane Plus Bending Stress in SS-B Plates	3 (XXVII-1)	16 (IV-1)	21 (VII-1)	48 (X-1)
Membrane Plus Bending Stress Allowable in SS-B Plates Margin of safety	414 137.00	414 24.88	414 18.71	414 7.63

*All stress magnitudes are in MPa

9. ATTACHMENTS

The following Attachments are provided in this section :

Attachment I (10 pages): Figures obtained from ANSYS V5.1.

Attachment II (1 page): Linearized stresses in the inner barrier with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: ibstress: Apr 10 1996

Attachment III (1 page): Linearized stresses in guides with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: bktstres: Apr 10 1996

Attachment IV (1 page): Linearized stresses in SS-B plates with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: pltstres: Apr 10 1996

Attachment V (1 page): Linearized stresses in the inner barrier with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: ibstress: Apr 11 1996

Attachment VI (1 page): Linearized stresses in guides with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: bktstres: Apr 11 1996

Attachment VII (1 page): Linearized stresses in SS-B plates with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: pltstres: Apr 11 1996

Attachment VIII (1 page): Linearized stresses in the inner barrier with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: ibstress: Apr 10 1996

Attachment IX (1 page): Linearized stresses in guides with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: bktstres: Apr 10 1996

Attachment X (1 page): Linearized stresses in SS-B plates with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: pltstres: Apr 10 1996

Attachment XI (108 pages): Input/output files for the finite-element analysis of the WP with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: seism3.old.out: Apr 09 1996

Attachment XII (6 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: postf3.old.out: Apr 10 1996

Attachment XIII (8 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: postlin3.old.out: Apr 10 1996

Attachment XIV (1 page): Mode combination file for the finite-element analysis of the WP with 100% outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: seism3.mcom: Apr 09 1996

Attachment XV (111 pages): Input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: seism2.old.out: Apr 11 1996

Attachment XVI (6 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: postf2.old.out: Apr 11 1996

Attachment XVII (8 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: postlin2.old.out: Apr 11 1996

Attachment XVIII (1 page): Mode combination file for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: seism2.mcom: Apr 11 1996

Attachment XIX (112 pages): Input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: seism4.old.out: Apr 10 1996

Attachment XX (6 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: postf4.old.out: Apr 10 1996

Attachment XXI (8 pages): Postprocessing input/output files for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: postlin4.old.out: Apr 10 1996

Attachment XXII (1 page): Mode combination file for the finite-element analysis of the WP with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation: seism4.mcom: Apr 10 1996

Attachment XXIII (110 pages): Input/output files for the mass adjustment of the finite-element analysis with 100% outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation: adjust.old1.out: Apr 11 1996

Attachment XXIV (1 page): Linearized stresses in the outer barrier using the model of no degradation: obstress: Apr 20 1996

Attachment XXV (1 page): Linearized stresses in the inner barrier using the model of no degradation: ibstress: Apr 20 1996

Attachment XXVI (1 page): Linearized stresses in the guides using the model of no degradation: bktstres: Apr 20 1996

Attachment XXVII (1 page): Linearized stresses in the SS-B plates using the model of no degradation: pltstres: Apr 20 1996

Attachment XXVIII (149 pages): Input/output files for the finite-element analysis of the waste package with no degradation: seism5.old1.out: Apr 20 1996

Attachment XXIX (6 pages): Postprocessing input/output files for the finite-element analysis of the WP with no degradation: postf5.old1.out: Apr 20 1996

Attachment XXX (8 pages): Postprocessing input/output files for the finite-element analysis of the WP with no degradation: postlin5.old1.out: Apr 20 1996

Attachment XXXI (1 page): Mode combination file for the finite-element analysis of the WP with no degradation: seism5.mcom: Apr 20 1996

Attachment XXXII (3 pages): Output file to obtain the maximum stress intensity locations in the WP components (no degradation): seism4.res: Apr 20 1996

Attachment XXXIII (3 pages): Output file to obtain the maximum stress intensity locations in the WP components (100%outer barrier, 75% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation): seism3.res: Apr 10 1996

Attachment XXXIV (3 pages): Output file to obtain the maximum stress intensity locations in the WP components (100%outer barrier, 90% inner barrier, 100% tube, 50% guide, and 0% SS-B plate degradation): seism2.res: Apr 11 1996

Attachment XXXV (3 pages): Output file to obtain the maximum stress intensity locations in the WP components (100%outer barrier, 90% inner barrier, 100% tube, 50% guide, and 50% SS-B plate degradation): seism4.res: Apr 10 1996

Attachment XXXVI (1 page): Backfill profile of a typical waste emplacement drift

Attachment XXXVII (2 pages): Bench-scale experimental determination of the thermal diffusivity of crushed tuff. Excerpts from draft of SAND 94-2320.

Attachment XXXVIII (143 pages): ANSYS calculated mass of the tubes corresponding to actual density for the model with no degradation: seism5.old2.out: Jun 01 1996

The sketches for the waste package are provided in the below Attachment:

XXXIX: Sketches (11 pages)

XXXIX-1: Waste Package Tube Design (21-PWR) Outer Barrier Preliminary Sketch.

XXXIX-2: Waste Package Tube Design (21-PWR) Outer Barrier Lid Preliminary Sketch

XXXIX-3: Waste Package Tube Design (21-PWR) Inner Barrier Preliminary Sketch

XXXIX-4: Waste Package Tube Design (21-PWR) Inner Barrier Lid Preliminary Sketch

XXXIX-5: Waste Package Tube Design (21-PWR) Tube Preliminary Sketch

XXXIX-6: Waste Package Tube Design (21-PWR) A-Plate Preliminary Sketch

XXXIX-7: Waste Package Tube Design (21-PWR) B-Plate Preliminary Sketch

XXXIX-8: Waste Package Tube Design (21-PWR) C-Plate Preliminary Sketch

XXXIX-9: Waste Package Tube Design (21-PWR) Corner Guide Preliminary Sketch

XXXIX-10: Waste Package Tube Design (21-PWR) A-Guide Preliminary Sketch

XXXIX-11: Waste Package Tube Design (21-PWR) B-Guide Preliminary Sketch

Attachment XL (1 page): Linearized stresses in the inner barrier using the model of no degradation: ibstress2: Jun 09 1996

Attachment XLI (1 page): Linearized stresses in the guides using the model of no degradation: bktstres2: Jun 09 1996

Attachment XLII (1 page): Linearized stresses in the SS-B plates using the model of no degradation: pltstres2: Jun 09 1996

Attachment XLIII (112 pages): Input/output files for the finite-element analysis of the waste package with no degradation: seism4.old2.out: Jun 09 1996

Attachment XLIV (6 pages): Postprocessing input/output files for the finite-element analysis of the WP with no degradation: postf4.old2.out: Jun 09 1996

Attachment XLV (8 pages): Postprocessing input/output files for the finite-element analysis of the WP with no degradation: postlin4.old2.out: Jun 09 1996

Attachment XLVI (1 page): Mode combination file for the finite-element analysis of the WP with no degradation: seism4.mcom2: Jun 09 1996

Attachment XLVII (3 pages): Output file to obtain the maximum stress intensity locations in the WP components (no degradation): seism4.res2: Jun 09 1996

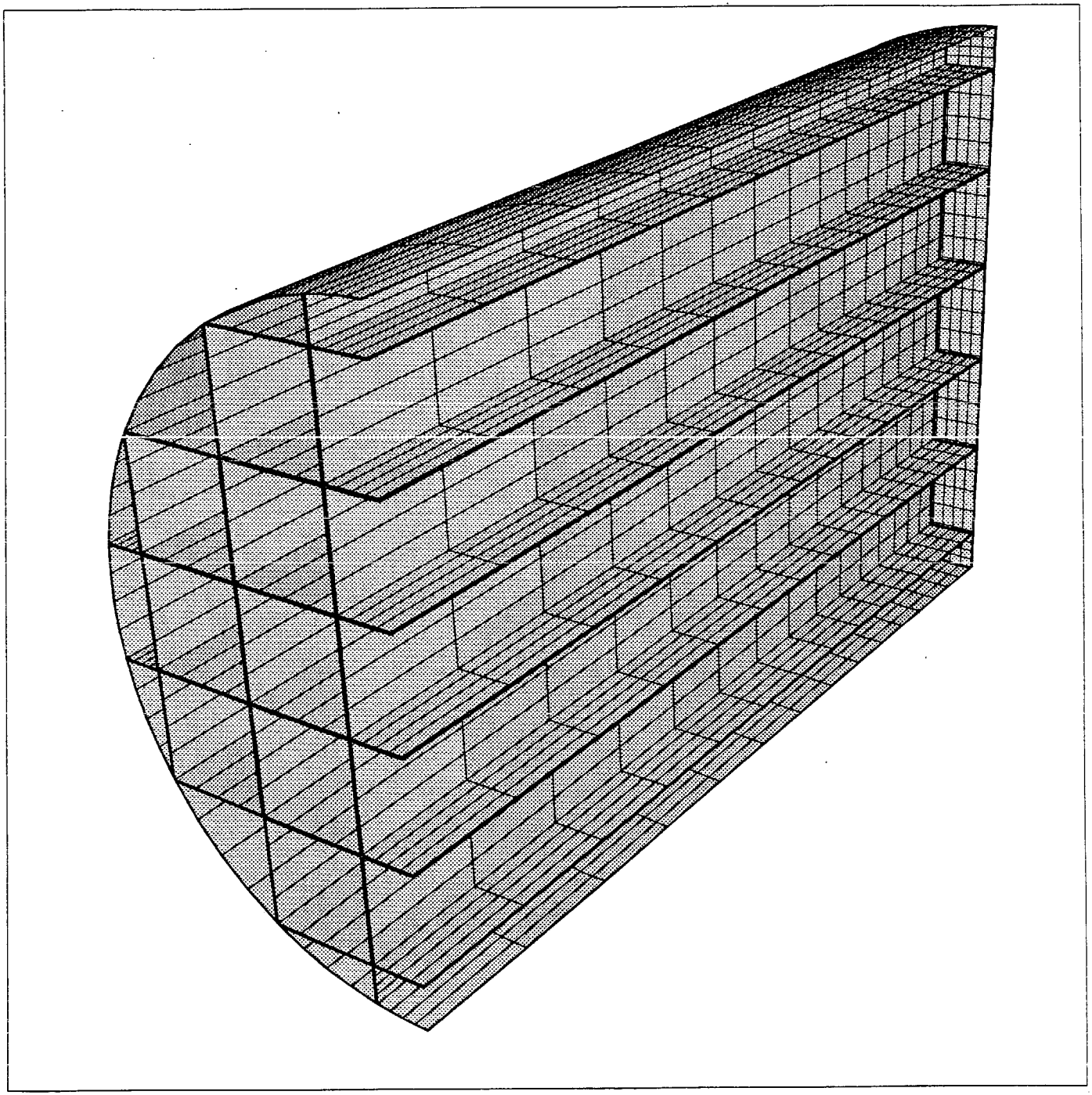

Figure I-1. Two-plane symmetry finite-element model of the WP (with degradation)

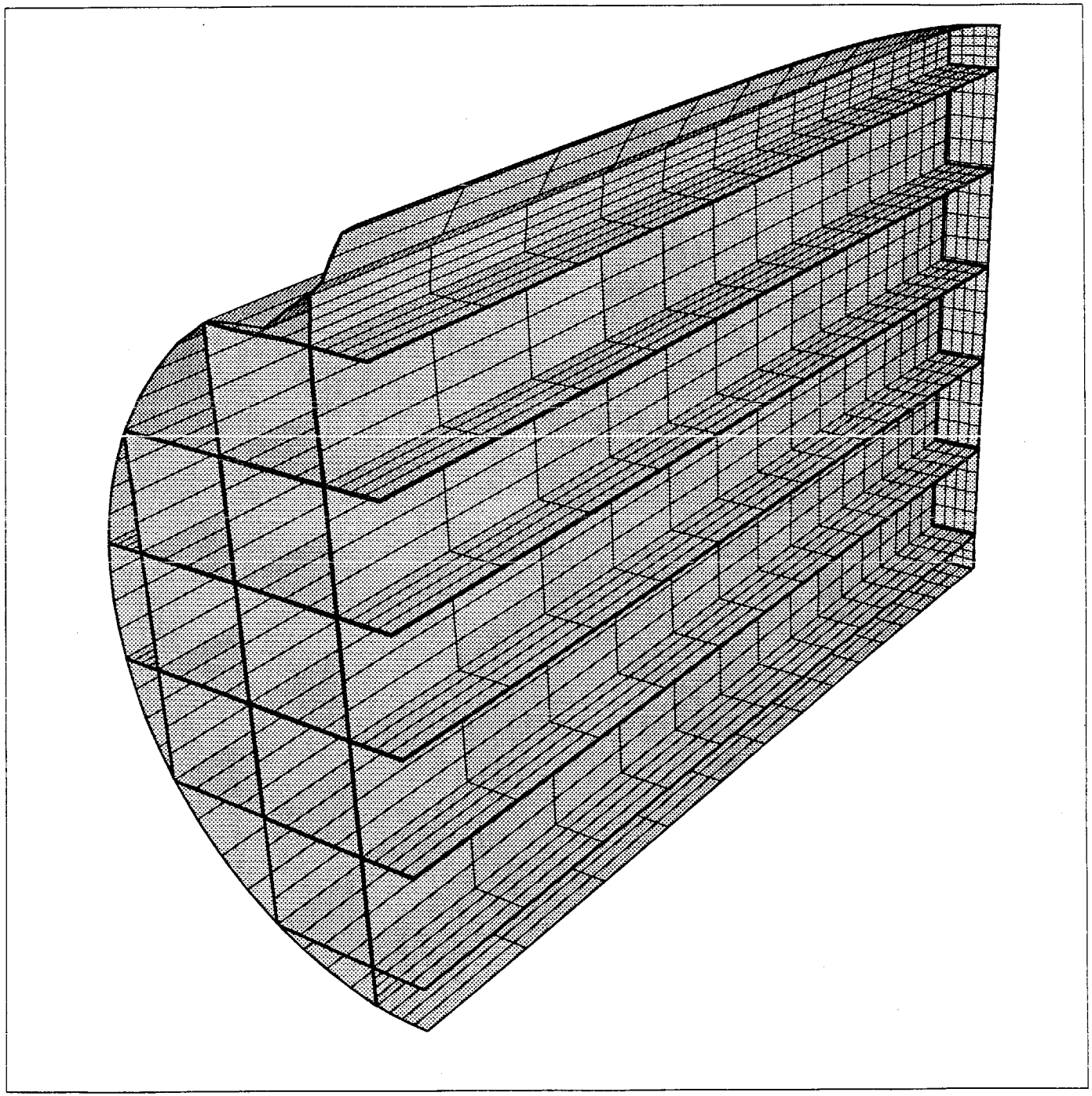

Figure I-2. First natural frequency and mode shape of a degraded WP

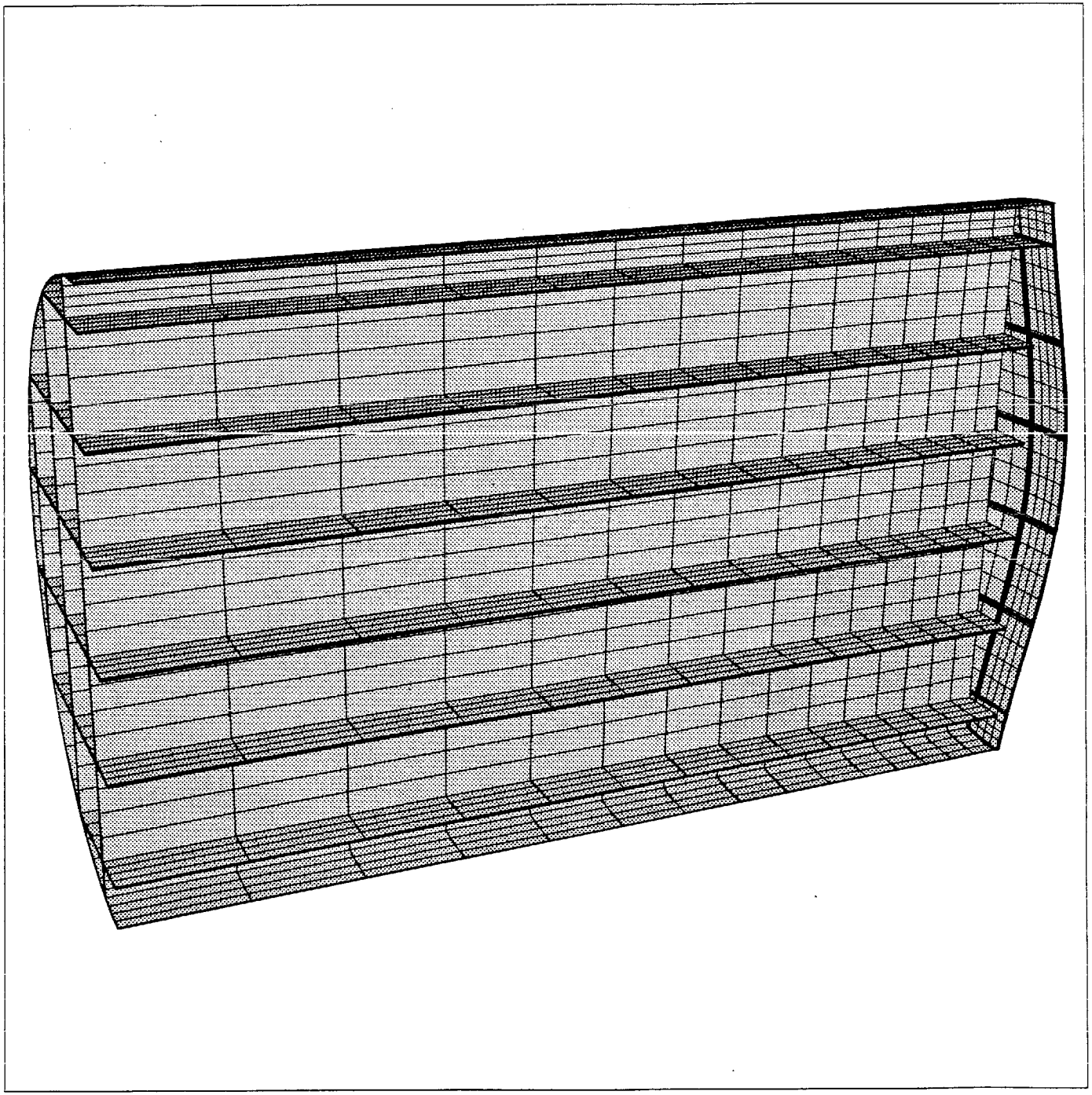

Figure I-3. Second natural frequency and mode shape of a degraded WP

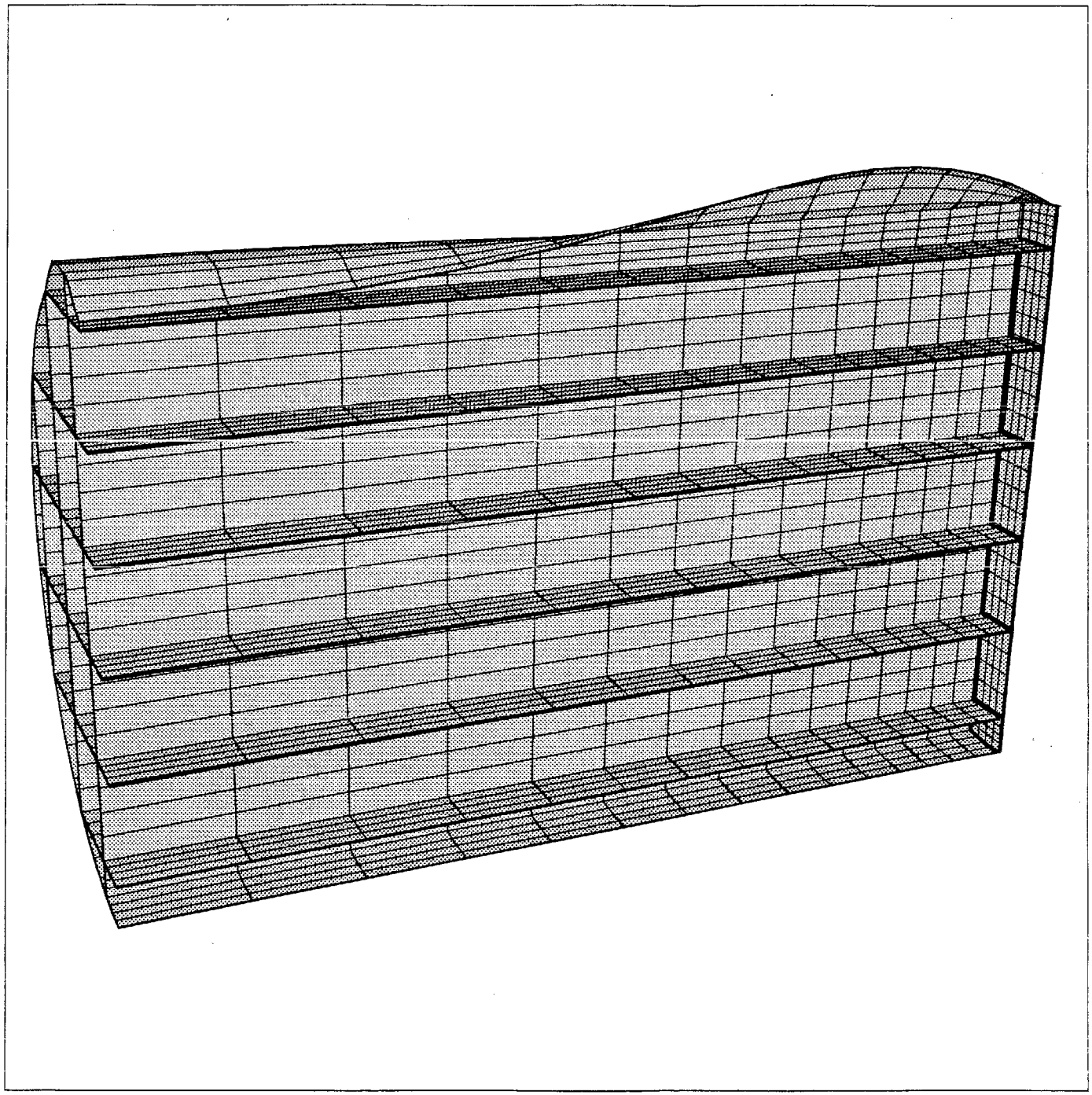

Figure I-4. Third natural frequency and mode shape of a degraded WP

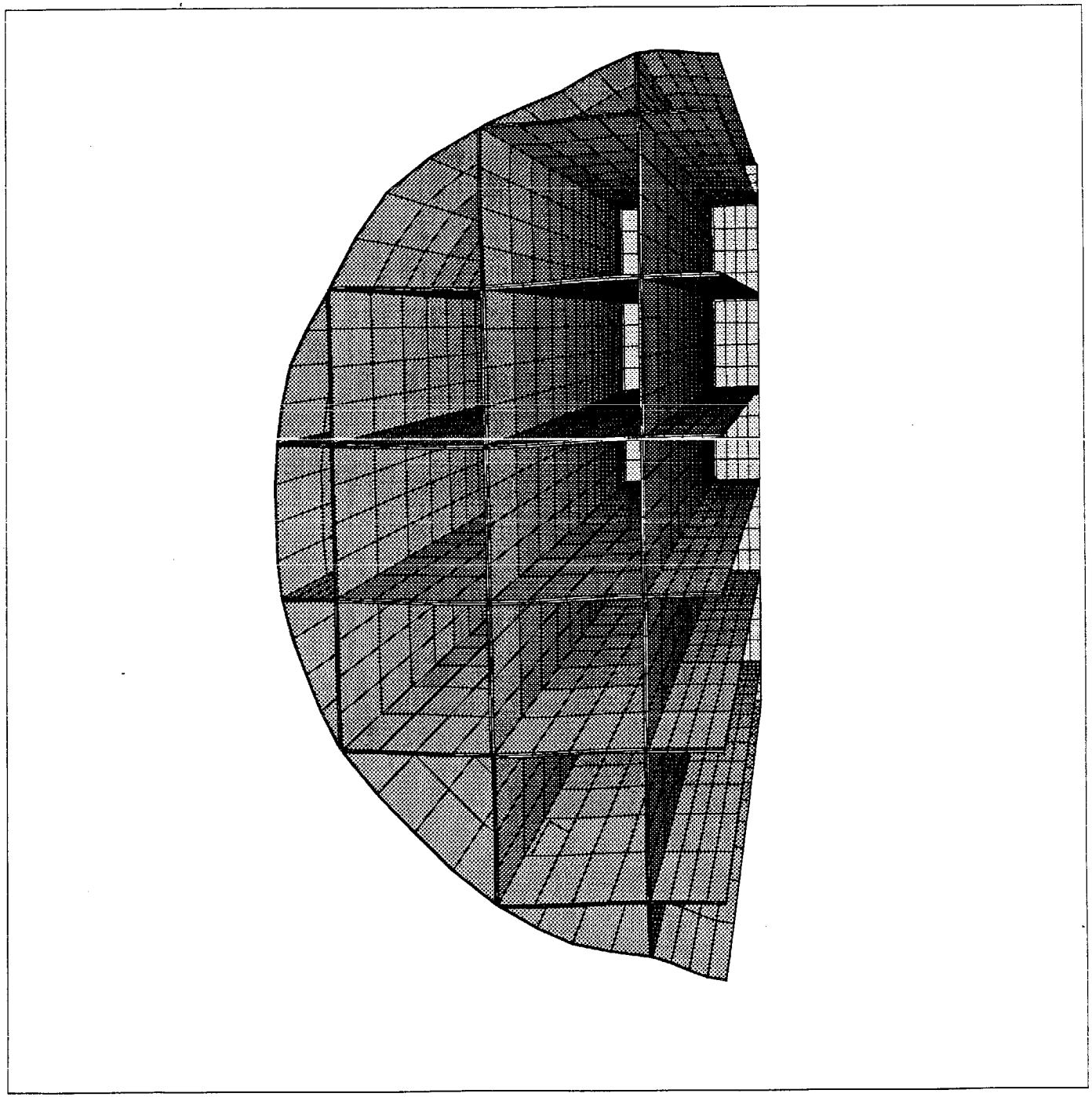

Figure I-5. Fourth natural frequency and mode shape of a degraded WP

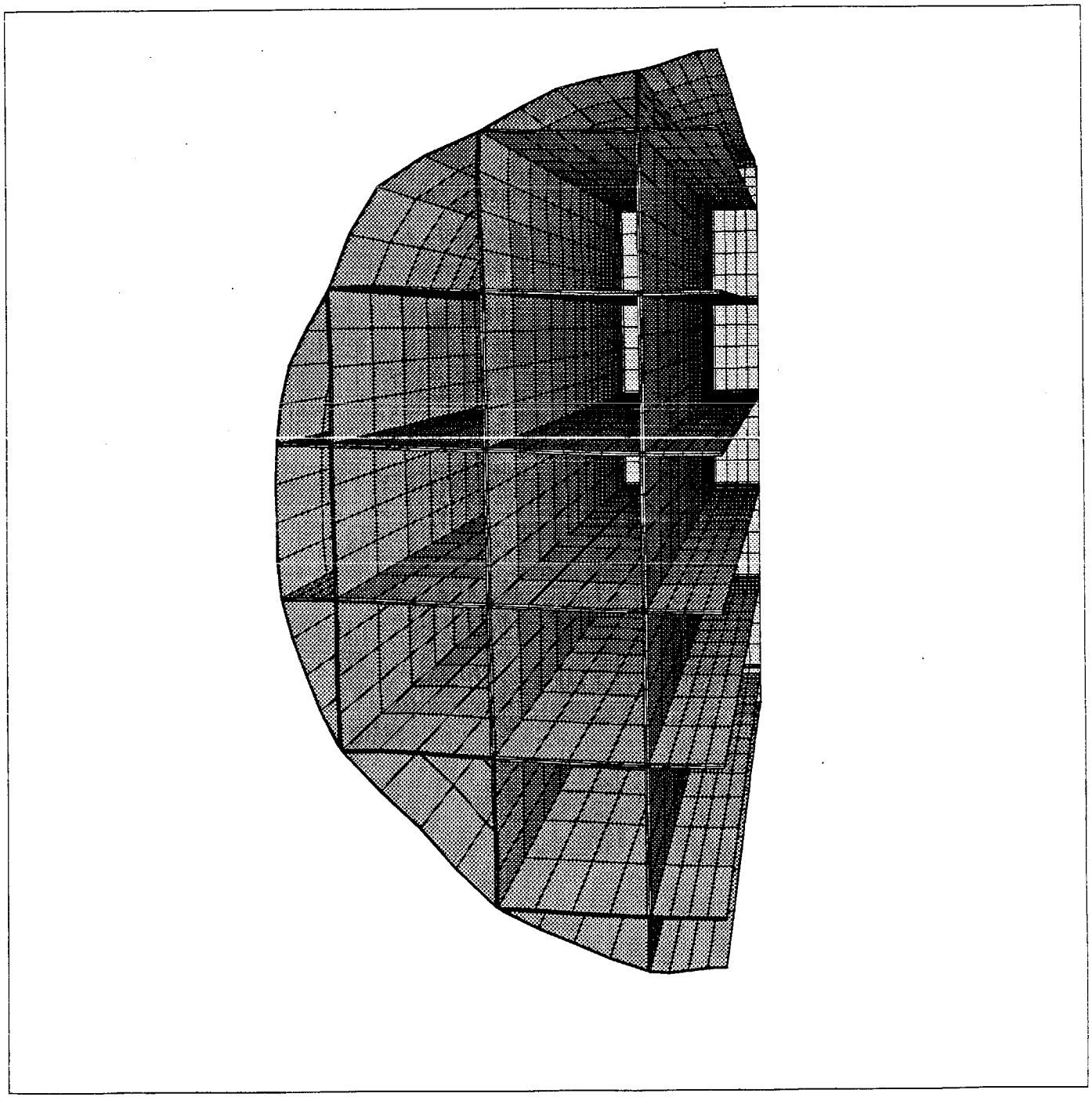

Figure I-6. Fifth natural frequency and mode shape of a degraded WP

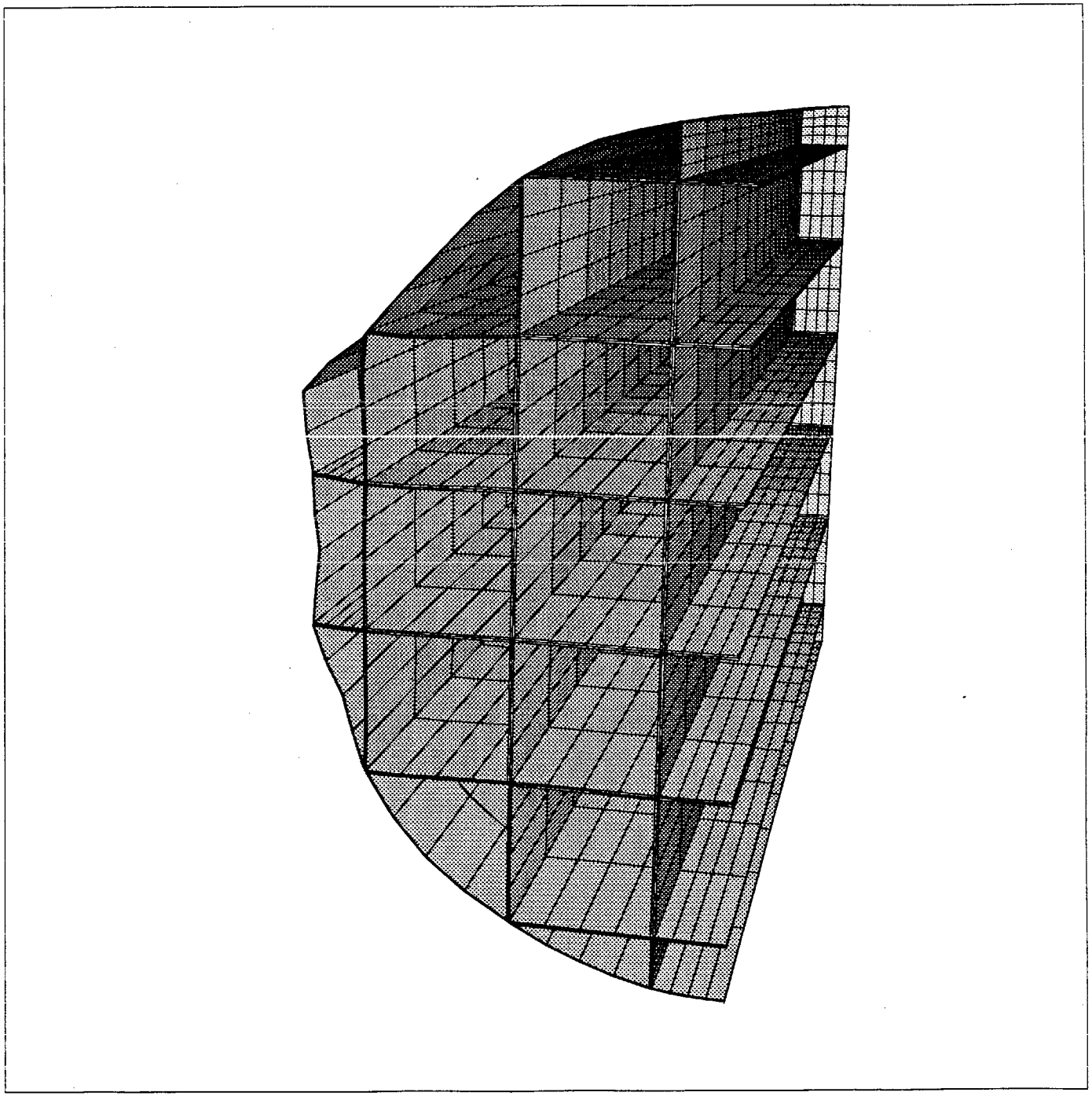

Figure I-7. Sixth natural frequency and mode shape of a degraded WP

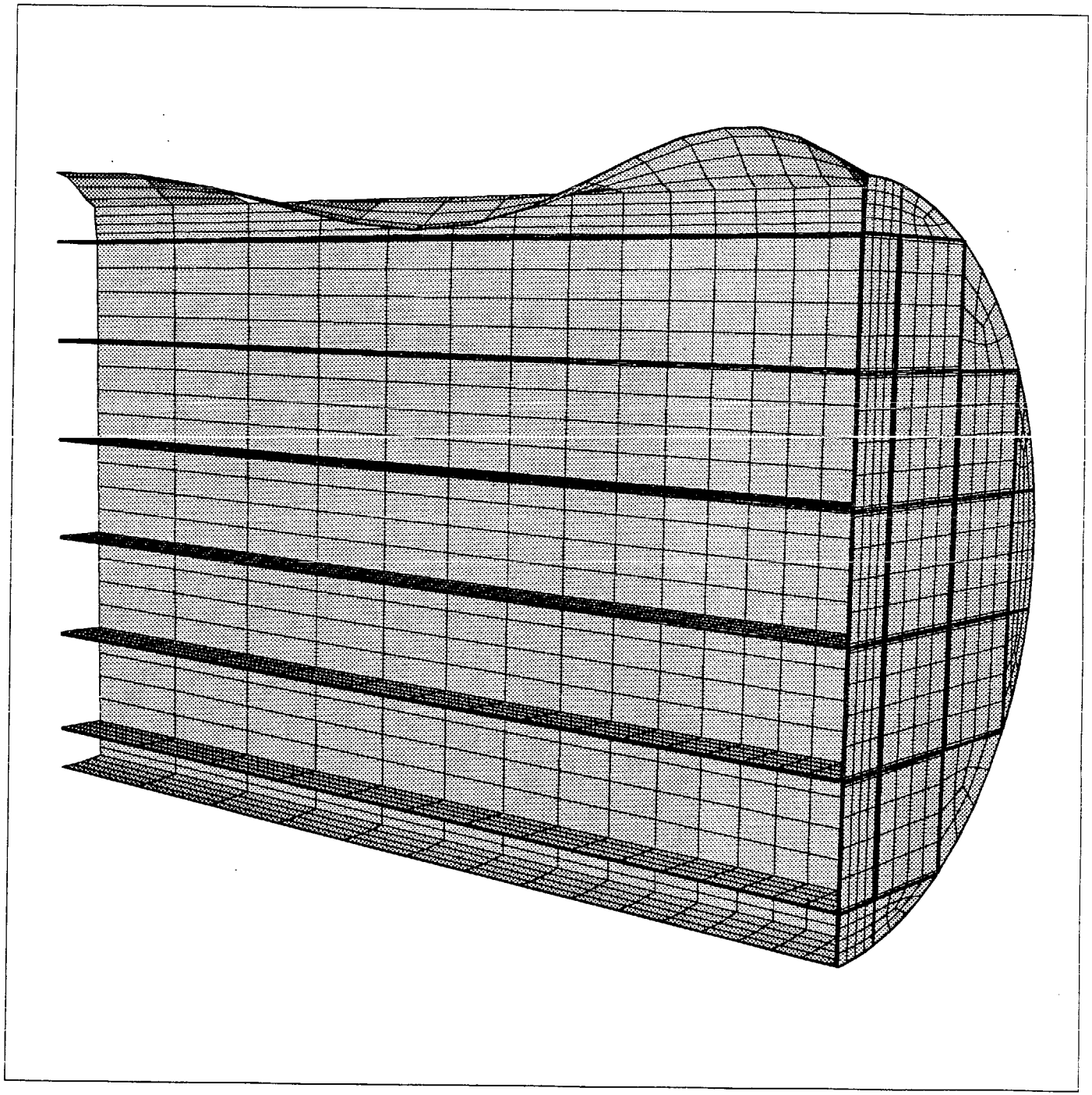

Figure I-8. Seventh natural frequency and mode shape of a degraded WP

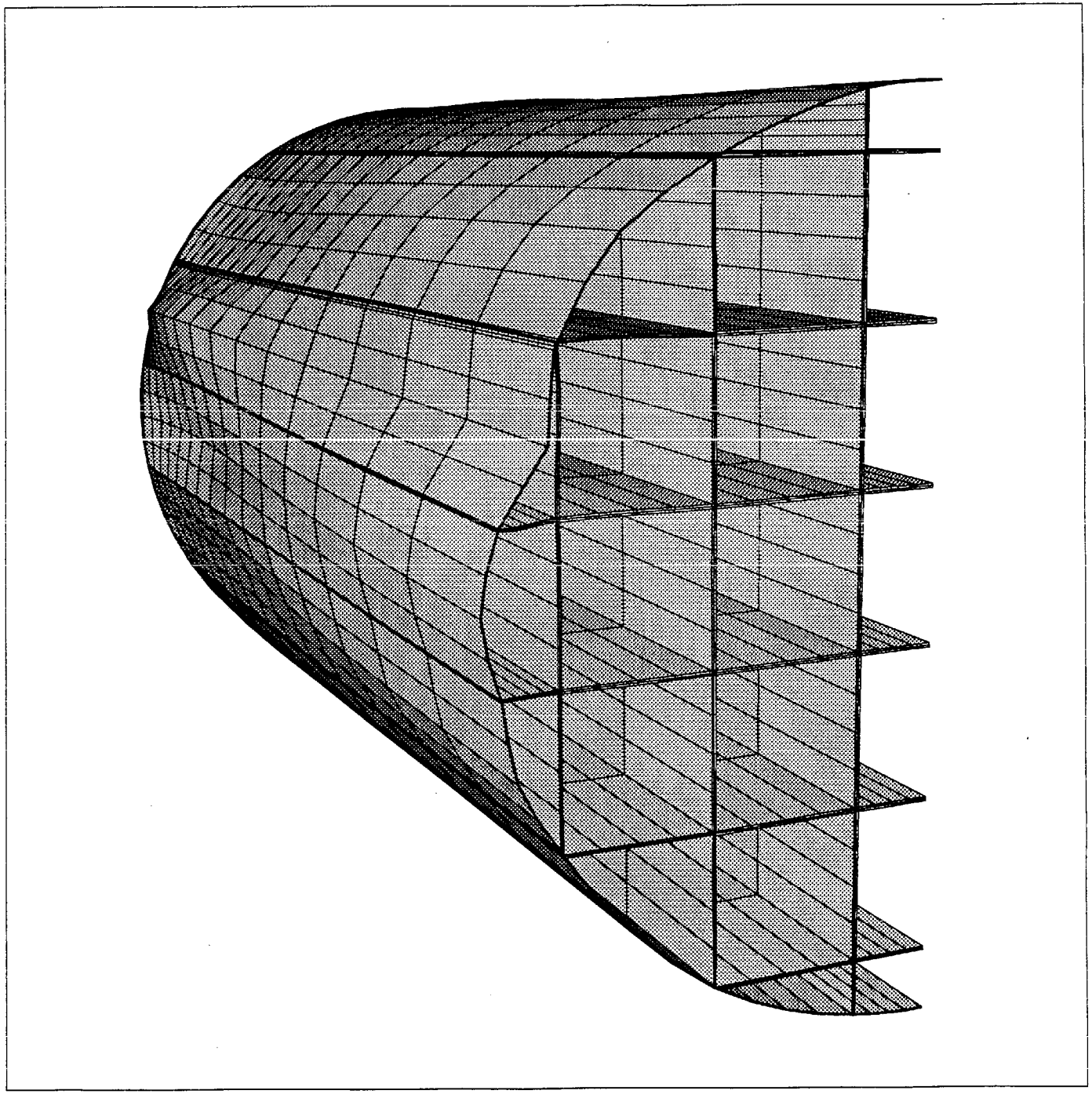

Figure I-9. Eighth natural frequency and mode shape of a degraded WP

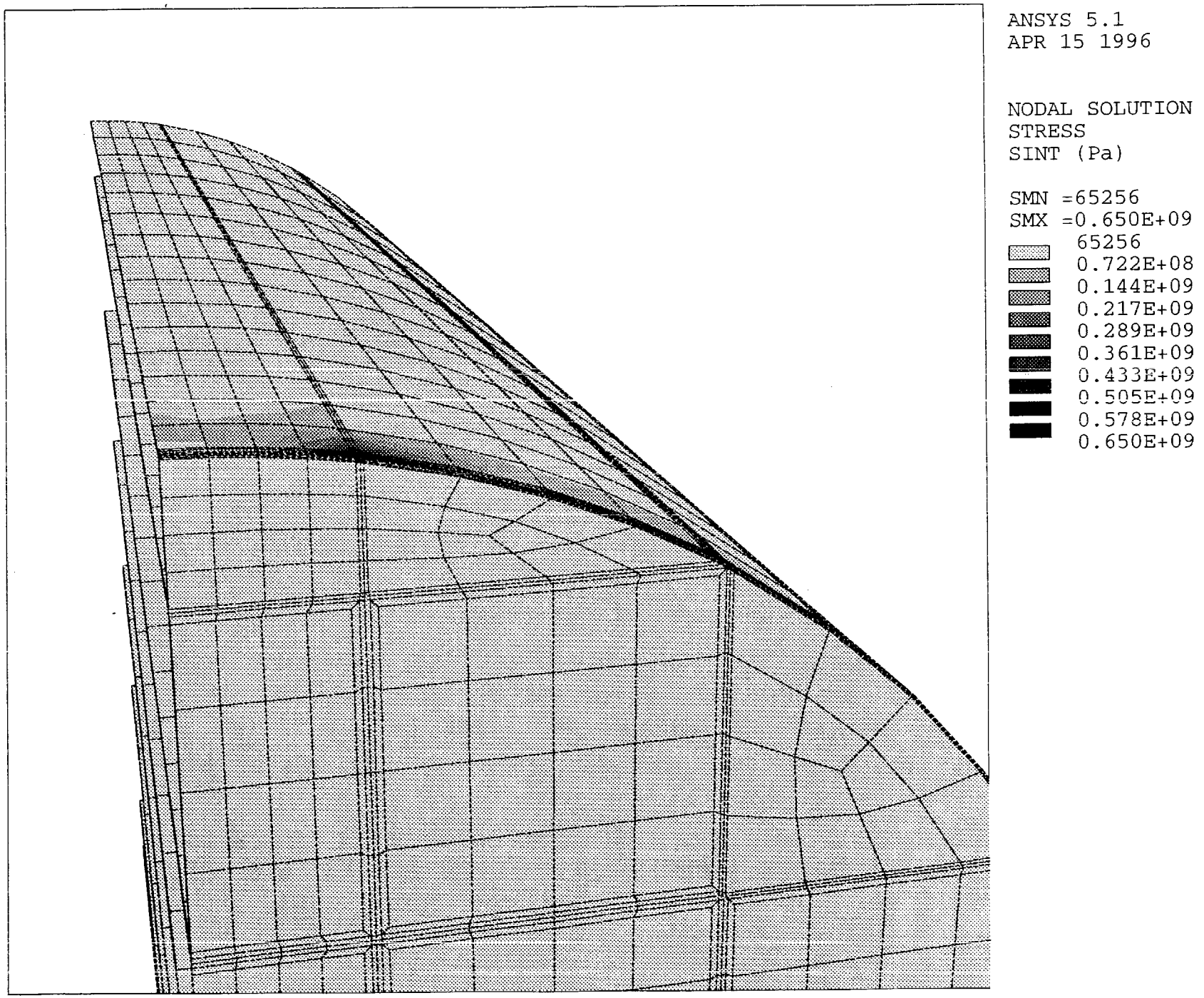

Figure I-10. Maximum stress intensity location in the WP

Inner Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:36:46 APR 10, 1996 CP= 100.860
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 12757 OUTSIDE NODE = 12761

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.3021E+08	0.1858E+08	0.4972E+08	0.6980E+07	0.3158E+08	0.5170E+07
S1	S2	S3	SINT	SEQV	
0.7096E+08	0.2894E+08	-0.1393E+07	0.7235E+08	0.6293E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1137E+08	0.2686E+07	0.1816E+08	-0.3375E+07	0.2097E+07	-0.7077E+06
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1137E+08	-0.2686E+07	-0.1816E+08	0.3375E+07	-0.2097E+07	0.7077E+06
	S1	S2	S3	SINT	SEQV	
I	0.1849E+08	0.3133E+07	-0.1214E+08	0.3062E+08	0.2652E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1214E+08	-0.3133E+07	-0.1849E+08	0.3062E+08	0.2652E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1885E+08	0.2126E+08	0.6788E+08	0.3605E+07	0.3367E+08	0.4463E+07
C	0.3021E+08	0.1858E+08	0.4972E+08	0.6980E+07	0.3158E+08	0.5170E+07
O	0.4158E+08	0.1589E+08	0.3155E+08	0.1036E+08	0.2948E+08	0.5878E+07
	S1	S2	S3	SINT	SEQV	
I	0.8600E+08	0.1846E+08	0.3534E+07	0.8246E+08	0.7611E+08	
C	0.7096E+08	0.2894E+08	-0.1393E+07	0.7235E+08	0.6293E+08	
O	0.6065E+08	0.3561E+08	-0.7237E+07	0.6788E+08	0.5946E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1585E+08	0.4915E+05	0.4006E+08	0.2511E+07	0.1145E+06	0.8064E+06
C	-0.1586E+08	-0.4799E+05	-0.4006E+08	-0.2513E+07	-0.1136E+06	-0.8067E+06
O	0.1586E+08	0.4682E+05	0.4005E+08	0.2514E+07	0.1127E+06	0.8070E+06
	S1	S2	S3	SINT	SEQV	
I	0.4009E+08	0.1621E+08	-0.3403E+06	0.4043E+08	0.3521E+08	
C	0.3418E+06	-0.1622E+08	-0.4008E+08	0.4042E+08	0.3520E+08	
O	0.4008E+08	0.1622E+08	-0.3433E+06	0.4042E+08	0.3519E+08	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.3470E+08	0.2131E+08	0.1079E+09	0.6116E+07	0.3379E+08	0.5269E+07
C	0.1436E+08	0.1853E+08	0.9661E+07	0.4467E+07	0.3146E+08	0.4364E+07
O	0.5744E+08	0.1594E+08	0.7160E+08	0.1287E+08	0.2959E+08	0.6685E+07
	S1	S2	S3	SINT	SEQV	TEMP
I	0.1201E+09	0.3479E+08	0.9036E+07	0.1111E+09	0.1007E+09	0.0000E+00
C	0.4706E+08	0.1317E+08	-0.1768E+08	0.6474E+08	0.5609E+08	
O	0.8858E+08	0.5479E+08	0.1600E+07	0.8698E+08	0.7595E+08	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:36:47 APR 10, 1996 CP= 101.960
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21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 4388 OUTSIDE NODE = 4310

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

	SX	SY	SZ	SXY	SYZ	SXZ
	0.4724E+07	0.6369E+08	0.1747E+07	0.2824E+07	0.1408E+08	0.1786E+07
	S1	S2	S3	SINT	SEQV	
	0.6689E+08	0.4781E+07	-0.1519E+07	0.6841E+08	0.6549E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1616E+06	0.7331E+06	-0.1922E+06	-0.6529E+06	0.1216E+06	0.7657E+06
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1616E+06	-0.7331E+06	0.1922E+06	0.6529E+06	-0.1216E+06	-0.7657E+06
	S1	S2	S3	SINT	SEQV	
I	0.1251E+07	0.4120E+06	-0.9600E+06	0.2211E+07	0.1933E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.9600E+06	-0.4120E+06	-0.1251E+07	0.2211E+07	0.1933E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4885E+07	0.6442E+08	0.1555E+07	0.2171E+07	0.1420E+08	0.2552E+07
C	0.4724E+07	0.6369E+08	0.1747E+07	0.2824E+07	0.1408E+08	0.1786E+07
O	0.4562E+07	0.6295E+08	0.1940E+07	0.3477E+07	0.1396E+08	0.1020E+07
	S1	S2	S3	SINT	SEQV	
I	0.6759E+08	0.5375E+07	-0.2106E+07	0.6970E+08	0.6627E+08	
C	0.6689E+08	0.4781E+07	-0.1519E+07	0.6841E+08	0.6549E+08	
O	0.6621E+08	0.4362E+07	-0.1114E+07	0.6732E+08	0.6476E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.2080E+06	0.1297E+07	0.1077E+07	0.3344E+05	0.6627E+05	-1218.
C	0.2081E+06	-0.1297E+07	-0.1077E+07	-0.3372E+05	-0.6621E+05	1550.
O	-0.2081E+06	0.1296E+07	0.1077E+07	0.3400E+05	0.6616E+05	-1883.
	S1	S2	S3	SINT	SEQV	
I	0.1316E+07	0.1059E+07	-0.2087E+06	0.1525E+07	0.1414E+07	
C	0.2088E+06	-0.1059E+07	-0.1316E+07	0.1525E+07	0.1414E+07	
O	0.1315E+07	0.1059E+07	-0.2089E+06	0.1524E+07	0.1414E+07	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4677E+07	0.6572E+08	0.2632E+07	0.2204E+07	0.1427E+08	0.2551E+07
C	0.4932E+07	0.6239E+08	0.6705E+06	0.2790E+07	0.1401E+08	0.1788E+07
O	0.4354E+07	0.6425E+08	0.3017E+07	0.3511E+07	0.1402E+08	0.1019E+07
	S1	S2	S3	SINT	SEQV	TEMP
I	0.6891E+08	0.5282E+07	-0.1162E+07	0.7007E+08	0.6708E+08	0.0000E+00
C	0.6558E+08	0.4955E+07	-0.2545E+07	0.6813E+08	0.6470E+08	
O	0.6752E+08	0.4158E+07	-0.5688E+05	0.6758E+08	0.6557E+08	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:36:49 APR 10, 1996 CP= 103.080
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21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 940 OUTSIDE NODE = 1064

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.5519E+06	0.1464E+08	0.1233E+07	0.6384E+06	0.2117E+07	0.2774E+06
S1	S2	S3	SINT	SEQV	
0.1500E+08	0.9750E+06	0.4518E+06	0.1455E+08	0.1429E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.6795E+05	0.1701E+07	0.5551E+06	-0.2949E+06	0.2707E+05	0.1712E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.6795E+05	-0.1701E+07	-0.5551E+06	0.2949E+06	-0.2707E+05	-0.1712E+05
	S1	S2	S3	SINT	SEQV	
I	0.1749E+07	0.5552E+06	-0.1165E+06	0.1866E+07	0.1637E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1165E+06	-0.5552E+06	-0.1749E+07	0.1866E+07	0.1637E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4839E+06	0.1634E+08	0.1788E+07	0.3435E+06	0.2144E+07	0.2945E+06
C	0.5519E+06	0.1464E+08	0.1233E+07	0.6384E+06	0.2117E+07	0.2774E+06
O	0.6198E+06	0.1294E+08	0.6777E+06	0.9333E+06	0.2090E+07	0.2603E+06
	S1	S2	S3	SINT	SEQV	
I	0.1666E+08	0.1534E+07	0.4194E+06	0.1624E+08	0.1571E+08	
C	0.1500E+08	0.9750E+06	0.4518E+06	0.1455E+08	0.1429E+08	
O	0.1336E+08	0.5888E+06	0.2893E+06	0.1307E+08	0.1292E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-4485.	0.8379E+05	0.6287E+05	-457.3	-2115.	-125.9
C	4455.	-0.8305E+05	-0.6263E+05	329.2	2127.	133.3
O	-4426.	0.8231E+05	0.6239E+05	-201.2	-2139.	-140.8
	S1	S2	S3	SINT	SEQV	
I	0.8400E+05	0.6266E+05	-4487.	0.8849E+05	0.7999E+05	
C	4457.	-0.6241E+05	-0.8327E+05	0.8773E+05	0.7938E+05	
O	0.8254E+05	0.6217E+05	-4427.	0.8697E+05	0.7878E+05	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4794E+06	0.1642E+08	0.1851E+07	0.3431E+06	0.2142E+07	0.2944E+06
C	0.5563E+06	0.1456E+08	0.1170E+07	0.6387E+06	0.2120E+07	0.2776E+06
O	0.6154E+06	0.1302E+08	0.7401E+06	0.9331E+06	0.2088E+07	0.2602E+06
	S1	S2	S3	SINT	SEQV	TEMP
I	0.1674E+08	0.1595E+07	0.4182E+06	0.1632E+08	0.1577E+08	0.0000E+00
C	0.1492E+08	0.9211E+06	0.4461E+06	0.1447E+08	0.1424E+08	
O	0.1344E+08	0.5968E+06	0.3410E+06	0.1310E+08	0.1297E+08	0.0000E+00

Inner Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX (8:28:03 APR 11, 1996 CP= 102.480
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 12757 OUTSIDE NODE = 12761

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.1526E+09	0.1527E+09	0.3974E+09	0.2899E+08	0.6161E+08	0.2445E+08
S1	S2	S3	SINT	SEQV	
0.4156E+09	0.1666E+09	0.1205E+09	0.2951E+09	0.2750E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1092E+08	0.2164E+07	0.4410E+08	-0.9446E+07	-0.2672E+07	0.3837E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1092E+08	-0.2164E+07	-0.4410E+08	0.9446E+07	0.2672E+07	-0.3837E+07
	S1	S2	S3	SINT	SEQV	
I	0.4489E+08	0.1617E+08	-0.3870E+07	0.4876E+08	0.4245E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.3870E+07	-0.1617E+08	-0.4489E+08	0.4876E+08	0.4245E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1635E+09	0.1548E+09	0.4415E+09	0.1955E+08	0.5894E+08	0.2829E+08
C	0.1526E+09	0.1527E+09	0.3974E+09	0.2899E+08	0.6161E+08	0.2445E+08
O	0.1417E+09	0.1505E+09	0.3533E+09	0.3844E+08	0.6428E+08	0.2061E+08
	S1	S2	S3	SINT	SEQV	
I	0.4566E+09	0.1677E+09	0.1356E+09	0.3209E+09	0.3062E+09	
C	0.4156E+09	0.1666E+09	0.1205E+09	0.2951E+09	0.2750E+09	
O	0.3760E+09	0.1658E+09	0.1037E+09	0.2723E+09	0.2472E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.9027E+08	0.5299E+07	0.3486E+09	0.8295E+07	-0.6147E+06	0.1190E+08
C	-0.9027E+08	-0.5298E+07	-0.3486E+09	-0.8299E+07	0.6135E+06	-0.1190E+08
O	0.9026E+08	0.5297E+07	0.3486E+09	0.8303E+07	-0.6124E+06	0.1190E+08
	S1	S2	S3	SINT	SEQV	
I	0.3491E+09	0.9054E+08	0.4488E+07	0.3447E+09	0.3107E+09	
C	-0.4486E+07	-0.9053E+08	-0.3491E+09	0.3446E+09	0.3107E+09	
O	0.3491E+09	0.9053E+08	0.4484E+07	0.3446E+09	0.3107E+09	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2538E+09	0.1601E+09	0.7901E+09	0.2784E+08	0.5832E+08	0.4019E+08
C	0.6233E+08	0.1474E+09	0.4884E+08	0.2069E+08	0.6222E+08	0.1255E+08
O	0.2319E+09	0.1558E+09	0.7019E+09	0.4674E+08	0.6367E+08	0.3251E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.7988E+09	0.2561E+09	0.1491E+09	0.6497E+09	0.6033E+09	0.0000E+00
C	0.1823E+09	0.5763E+08	0.1861E+08	0.1637E+09	0.1481E+09	
O	0.7122E+09	0.2473E+09	0.1301E+09	0.5820E+09	0.5332E+09	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX C8:28:04 APR 11, 1996 CP= 103.610
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 6133 OUTSIDE NODE = 6069

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.1177E+09	0.1097E+09	0.3406E+09	0.2378E+08	0.8156E+08	0.1669E+08
S1	S2	S3	SINT	SEQV	
0.3686E+09	0.1233E+09	0.7604E+08	0.2926E+09	0.2720E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1220E+07	-0.3987E+07	0.7955E+06	-0.6547E+07	0.7130E+07	0.7826E+06
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1220E+07	0.3987E+07	-0.7955E+06	0.6547E+07	-0.7130E+07	-0.7826E+06
	S1	S2	S3	SINT	SEQV	
I	0.7450E+07	0.4240E+06	-0.1229E+08	0.1974E+08	0.1733E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1229E+08	-0.4240E+06	-0.7450E+07	0.1974E+08	0.1733E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1165E+09	0.1058E+09	0.3414E+09	0.1723E+08	0.8869E+08	0.1748E+08
C	0.1177E+09	0.1097E+09	0.3406E+09	0.2378E+08	0.8156E+08	0.1669E+08
O	0.1189E+09	0.1137E+09	0.3398E+09	0.3033E+08	0.7443E+08	0.1591E+08
	S1	S2	S3	SINT	SEQV	
I	0.3729E+09	0.1174E+09	0.7329E+08	0.2996E+09	0.2802E+09	
C	0.3686E+09	0.1233E+09	0.7604E+08	0.2926E+09	0.2720E+09	
O	0.3644E+09	0.1314E+09	0.7656E+08	0.2879E+09	0.2647E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1372E+07	0.8983E+06	0.9830E+07	0.4697E+07	0.3247E+08	0.5745E+07
C	-0.1373E+07	-0.9000E+06	-0.9830E+07	-0.4700E+07	-0.3247E+08	-0.5745E+07
O	0.1373E+07	0.9018E+06	0.9829E+07	0.4703E+07	0.3247E+08	0.5745E+07
	S1	S2	S3	SINT	SEQV	
I	0.3958E+08	-0.6568E+05	-0.2742E+08	0.6700E+08	0.5835E+08	
C	0.2741E+08	0.6590E+05	-0.3958E+08	0.6699E+08	0.5834E+08	
O	0.3958E+08	-0.6613E+05	-0.2741E+08	0.6699E+08	0.5834E+08	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1178E+09	0.1066E+09	0.3512E+09	0.2193E+08	0.1212E+09	0.2322E+08
C	0.1163E+09	0.1088E+09	0.3307E+09	0.1908E+08	0.4909E+08	0.1095E+08
O	0.1203E+09	0.1146E+09	0.3496E+09	0.3503E+08	0.1069E+09	0.2166E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.4042E+09	0.1169E+09	0.5463E+08	0.3495E+09	0.3229E+09	0.0000E+00
C	0.3421E+09	0.1253E+09	0.8849E+08	0.2536E+09	0.2373E+09	
O	0.3949E+09	0.1276E+09	0.6203E+08	0.3329E+09	0.3054E+09	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 08:28:05 APR 11, 1996 CP= 104.720
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 3813 OUTSIDE NODE = 3877

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.4585E+07	0.1862E+08	0.1104E+07	0.3691E+07	0.3095E+07	0.8288E+06
S1	**S2**	**S3**	**SINT**	**SEQV**	
0.2007E+08	0.3675E+07	0.5621E+06	0.1951E+08	0.1815E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1894E+07	-0.1601E+07	0.3000E+05	-0.5528E+06	0.9027E+06	-0.1753E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1894E+07	0.1601E+07	-0.3000E+05	0.5528E+06	-0.9027E+06	0.1753E+05
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.4567E+06	-0.1464E+07	-0.2458E+07	0.2915E+07	0.2566E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.2458E+07	0.1464E+07	-0.4567E+06	0.2915E+07	0.2566E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2691E+07	0.1702E+08	0.1134E+07	0.3138E+07	0.3997E+07	0.8112E+06
C	0.4585E+07	0.1862E+08	0.1104E+07	0.3691E+07	0.3095E+07	0.8288E+06
O	0.6480E+07	0.2022E+08	0.1074E+07	0.4243E+07	0.2192E+07	0.8463E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.1863E+08	0.2034E+07	0.1829E+06	0.1844E+08	0.1759E+08	
C	0.2007E+08	0.3675E+07	0.5621E+06	0.1951E+08	0.1815E+08	
O	0.2169E+08	0.5285E+07	0.7985E+06	0.2089E+08	0.1905E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1368E+07	-0.3130E+07	0.4373E+06	9846.	-0.1621E+06	0.1030E+06
C	-0.1369E+07	0.3129E+07	-0.4373E+06	-0.1009E+05	0.1625E+06	-0.1030E+06
O	0.1370E+07	-0.3129E+07	0.4373E+06	0.1033E+05	-0.1628E+06	0.1030E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.1379E+07	0.4334E+06	-0.3137E+07	0.4517E+07	0.4126E+07	
C	0.3137E+07	-0.4335E+06	-0.1380E+07	0.4517E+07	0.4126E+07	
O	0.1381E+07	0.4335E+06	-0.3136E+07	0.4517E+07	0.4126E+07	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4059E+07	0.1389E+08	0.1572E+07	0.3148E+07	0.3835E+07	0.9142E+06
C	0.3216E+07	0.2175E+08	0.6670E+06	0.3681E+07	0.3257E+07	0.7258E+06
O	0.7849E+07	0.1709E+08	0.1512E+07	0.4254E+07	0.2029E+07	0.9493E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	**TEMP**
I	0.1589E+08	0.3151E+07	0.4749E+06	0.1542E+08	0.1427E+08	0.0000E+00
C	0.2295E+08	0.2516E+07	0.1635E+06	0.2279E+08	0.2171E+08	
O	0.1904E+08	0.6194E+07	0.1222E+07	0.1781E+08	0.1592E+08	0.0000E+00

Inner Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 19:39:17 APR 10, 1996 CP= 110.460
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 8632 OUTSIDE NODE = 8626

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.2017E+09	0.2057E+09	0.5358E+09	0.3370E+08	0.8480E+08	0.3282E+08
S1	S2	S3	SINT	SEQV	
0.5608E+09	0.2168E+09	0.1656E+09	0.3952E+09	0.3722E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1475E+08	0.3150E+07	0.6111E+08	-0.8897E+07	-0.4109E+07	0.5683E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1475E+08	-0.3150E+07	-0.6111E+08	0.8897E+07	0.4109E+07	-0.5683E+07
	S1	S2	S3	SINT	SEQV	
I	0.6225E+08	0.1844E+08	-0.1685E+07	0.6394E+08	0.5663E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1685E+07	-0.1844E+08	-0.6225E+08	0.6394E+08	0.5663E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2164E+09	0.2088E+09	0.5969E+09	0.2480E+08	0.8069E+08	0.3851E+08
C	0.2017E+09	0.2057E+09	0.5358E+09	0.3370E+08	0.8480E+08	0.3282E+08
O	0.1869E+09	0.2025E+09	0.4747E+09	0.4259E+08	0.8891E+08	0.2714E+08
	S1	S2	S3	SINT	SEQV	
I	0.6176E+09	0.2216E+09	0.1831E+09	0.4345E+09	0.4166E+09	
C	0.5608E+09	0.2168E+09	0.1656E+09	0.3952E+09	0.3722E+09	
O	0.5058E+09	0.2122E+09	0.1462E+09	0.3596E+09	0.3316E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1260E+09	0.7258E+07	0.4701E+09	0.8588E+07	-0.6454E+06	0.1516E+08
C	-0.1260E+09	-0.7256E+07	-0.4701E+09	-0.8592E+07	0.6436E+06	-0.1516E+08
O	0.1260E+09	0.7255E+07	0.4701E+09	0.8596E+07	-0.6418E+06	0.1516E+08
	S1	S2	S3	SINT	SEQV	
I	0.4708E+09	0.1260E+09	0.6634E+07	0.4642E+09	0.4175E+09	
C	-0.6632E+07	-0.1260E+09	-0.4708E+09	0.4641E+09	0.4175E+09	
O	0.4707E+09	0.1260E+09	0.6630E+07	0.4641E+09	0.4174E+09	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.3425E+09	0.2161E+09	0.1067E+10	0.3339E+08	0.8004E+08	0.5367E+08
C	0.7566E+08	0.1984E+09	0.6572E+08	0.2510E+08	0.8544E+08	0.1766E+08
O	0.3130E+09	0.2098E+09	0.9448E+09	0.5119E+08	0.8826E+08	0.4230E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.1079E+10	0.3440E+09	0.2028E+09	0.8761E+09	0.8147E+09	0.0000E+00
C	0.2457E+09	0.7073E+08	0.2341E+08	0.2222E+09	0.2028E+09	
O	0.9588E+09	0.3259E+09	0.1828E+09	0.7760E+09	0.7153E+09	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 19:39:18 APR 10, 1996 CP= 111.630
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 4355 OUTSIDE NODE = 4293

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

	SX	SY	SZ	SXY	SYZ	SXZ
	0.1471E+09	0.1405E+09	0.4258E+09	0.2924E+08	0.1077E+09	0.2064E+08
	S1	S2	S3	SINT	SEQV	
	0.4646E+09	0.1535E+09	0.9536E+08	0.3692E+09	0.3438E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.2656E+07	-0.4826E+07	-0.1250E+07	-0.1005E+08	0.8785E+07	0.2535E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.2656E+07	0.4826E+07	0.1250E+07	0.1005E+08	-0.8785E+07	-0.2535E+07
	S1	S2	S3	SINT	SEQV	
I	0.8662E+07	0.6485E+06	-0.1804E+08	0.2670E+08	0.2373E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1804E+08	-0.6485E+06	-0.8662E+07	0.2670E+08	0.2373E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1445E+09	0.1357E+09	0.4246E+09	0.1920E+08	0.1165E+09	0.2318E+08
C	0.1471E+09	0.1405E+09	0.4258E+09	0.2924E+08	0.1077E+09	0.2064E+08
O	0.1498E+09	0.1454E+09	0.4271E+09	0.3929E+08	0.9896E+08	0.1811E+08
	S1	S2	S3	SINT	SEQV	
I	0.4682E+09	0.1441E+09	0.9240E+08	0.3758E+09	0.3528E+09	
C	0.4646E+09	0.1535E+09	0.9536E+08	0.3692E+09	0.3438E+09	
O	0.4611E+09	0.1664E+09	0.9466E+08	0.3664E+09	0.3363E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1179E+07	0.9758E+05	0.1084E+08	0.6634E+07	0.4377E+08	0.8418E+07
C	-0.1181E+07	-0.9968E+05	-0.1084E+08	-0.6639E+07	-0.4377E+08	-0.8417E+07
O	0.1182E+07	0.1018E+06	0.1084E+08	0.6643E+07	0.4377E+08	0.8416E+07
	S1	S2	S3	SINT	SEQV	
I	0.5183E+08	-0.1072E+07	-0.3864E+08	0.9047E+08	0.7873E+08	
C	0.3864E+08	0.1072E+07	-0.5183E+08	0.9047E+08	0.7872E+08	
O	0.5183E+08	-0.1072E+07	-0.3863E+08	0.9046E+08	0.7871E+08	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1456E+09	0.1358E+09	0.4354E+09	0.2583E+08	0.1603E+09	0.3160E+08
C	0.1459E+09	0.1404E+09	0.4150E+09	0.2261E+08	0.6397E+08	0.1223E+08
O	0.1509E+09	0.1455E+09	0.4379E+09	0.4593E+08	0.1427E+09	0.2652E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.5092E+09	0.1430E+09	0.6461E+08	0.4446E+09	0.4111E+09	0.0000E+00
C	0.4301E+09	0.1571E+09	0.1141E+09	0.3161E+09	0.2969E+09	
O	0.5011E+09	0.1602E+09	0.7300E+08	0.4281E+09	0.3918E+09	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 19:39:21 APR 10, 1996 CP= 112.720
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 3878 OUTSIDE NODE = 3830

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.4471E+07	0.4632E+08	0.3238E+07	0.3216E+07	0.7746E+07	0.2414E+06
S1	S2	S3	SINT	SEQV	
0.4791E+08	0.4275E+07	0.1847E+07	0.4606E+08	0.4490E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.3870E+06	0.2471E+07	0.7155E+06	0.6338E+06	-0.2948E+06	-0.6948E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.3870E+06	-0.2471E+07	-0.7155E+06	-0.6338E+06	0.2948E+06	0.6948E+05
	S1	S2	S3	SINT	SEQV	
I	0.2695E+07	0.6696E+06	0.2091E+06	0.2486E+07	0.2291E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	-0.2091E+06	-0.6696E+06	-0.2695E+07	0.2486E+07	0.2291E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4858E+07	0.4880E+08	0.3954E+07	0.3850E+07	0.7451E+07	0.1720E+06
C	0.4471E+07	0.4632E+08	0.3238E+07	0.3216E+07	0.7746E+07	0.2414E+06
O	0.4084E+07	0.4385E+08	0.2523E+07	0.2582E+07	0.8041E+07	0.3109E+06
	S1	S2	S3	SINT	SEQV	
I	0.5032E+08	0.4640E+07	0.2644E+07	0.4768E+08	0.4671E+08	
C	0.4791E+08	0.4275E+07	0.1847E+07	0.4606E+08	0.4490E+08	
O	0.4553E+08	0.3932E+07	0.1004E+07	0.4452E+08	0.4313E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4062E+05	0.9307E+05	0.9657E+05	97.52	-0.1900E+05	-3593.
C	-0.4046E+05	-0.9199E+05	-0.9626E+05	177.7	0.1887E+05	3563.
O	0.4029E+05	0.9092E+05	0.9595E+05	-452.9	-0.1874E+05	-3533.
	S1	S2	S3	SINT	SEQV	
I	0.1140E+06	0.7590E+05	0.4037E+05	0.7363E+05	0.6378E+05	
C	-0.4019E+05	-0.7532E+05	-0.1132E+06	0.7302E+05	0.6325E+05	
O	0.1124E+06	0.7473E+05	0.4001E+05	0.7242E+05	0.6273E+05	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4899E+07	0.4889E+08	0.4050E+07	0.3850E+07	0.7432E+07	0.1684E+06
C	0.4431E+07	0.4623E+08	0.3142E+07	0.3216E+07	0.7765E+07	0.2450E+06
O	0.4125E+07	0.4394E+08	0.2619E+07	0.2582E+07	0.8022E+07	0.3074E+06
	S1	S2	S3	SINT	SEQV	TEMP
I	0.5041E+08	0.4685E+07	0.2742E+07	0.4767E+08	0.4673E+08	0.0000E+00
C	0.4783E+08	0.4233E+07	0.1746E+07	0.4608E+08	0.4489E+08	
O	0.4561E+08	0.3973E+07	0.1106E+07	0.4450E+08	0.4314E+08	0.0000E+00

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*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = seism3
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.160   TIME= 15:52:46
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism3    15:52:46  APR 09, 1996 CP=      0.160

    1  /com,*********************************************************************
    2  /com,*********************************************************************
    3  /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4  /com,*****  Degree of Degradation in Outer Barrier: 100%                   *****
    5  /com,*****  Degree of Degradation in Inner Barrier:  75%                   *****
    6  /com,*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
    7  /com,*****                                             Guides 50%          *****
    8  /com,*****                                             SS-B Plates 0%      *****
    9  /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
   10  /com,*****  Quarter Symmetry Model                                         *****
   11  /com,*********************************************************************
   12  /com,*********************************************************************
   13  /com,*********************************************************************
   14  /config,nvpag,512
   15  /units,si
   16  /prep7
   17  /title, 21 PWR Tube Seismic Analysis With Backfill
   18  /vcon,,0
   19  /com, Define Parameters
   20  ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   21  obir=0.71595            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   22  obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   23  obor=0.78095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   24  ts1=.007                ! SS-B Plate Thickness
   25  ts2=.005                ! CS Tube Thickness
   26  ts3=.005                ! Corner Guide Thickness
   27  ts4=.005                ! End Guide Thickness
   28  egih=0.0855             ! End Guide Fin Inner Height(0.0809+0.005-2.5*tan10)
   29  pie=3.1415926           ! Pi
   30  ang1=30*pie/180         ! Angle on end of end guide
   31  ang2=80*pie/180         ! Angle on end of end guide fin
   32  ang3=58*pie/180         ! Angle on end of corner guide
   33  tw=0.2285               ! Tube Inner Side Width
   34  pos1=tw/2               ! Dimension to Keypoint Position 1
   35  pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   36  pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   37  pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   38  pos5=pos4+tw            ! Dimension to Keypoint Position 5
   39  pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   40  pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   41  pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   42  pos9=pos8+tw            ! Dimension to Keypoint Position 9
   43  pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   44  pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   45  posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   46  posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   47  poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   48  posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   49  posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   50  poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
```

```
  51 poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
  52 bkht=4.575/2                ! Basket Height (Half Height)
  53 ibht=bkht+0.01               ! inner barrier cavity height
  54 !bgh=ibht-bkht              ! Basket Gap Height
  55 iblt=0.01                  ! inner lid height
  56 elev1=ibht+iblt            ! Elevation of Top of Inner Barrier
  57 ltlgh=0.030                ! Lid to Lid Gap Height
  58 elev2=elev1+ltlgh          ! Elevation of Bottom of Upper Outer Barrier Lid
  59 oblt=0.06                  ! outer lid height
  60 elev3=elev2+oblt           ! Elevation of Top of Upper Outer Barrier Lid
  61 stht=0.225                 ! skirt height
  62 elev4=elev3+stht           ! Elevation of Top of Waste Package
  63 elev5=-(iblt+oblt)         ! Elevation of Bottom of Lower Outer Barrier Lid
  64 elev6=elev5-stht           ! Elevation of Bottom of Waste Package
  65 /com, Line Divisions
  66 shd=1              ! Skirt Height Divisions
  67 obld=1             ! Outer Barrier Lid Divisions
  68 gd=2               ! Gap Divisions
  69 ibld=2             ! Inner Barrier Lid Divisions
  70 bd=15              ! Basket Divisions
  71 htwd=4             ! Half Tube Width Divisions
  72 twd=4              ! Tube Width Divisions
  73 thd=4              ! Tube Height Divisions
  74 egfd=4             ! End Guide Fin Divisions
  75 ptd=2              ! Plate Thickness Divisions
  76 ttd=1              ! Tube Thickness Divisions
  77 a1d=4              ! Arc 1 Divisions
  78 a2d=4              ! Arc 2 Divisions
  79 a3d=4              ! Arc 3 Divisions
  80 a4d=4              ! Arc 4 Divisions
  81 a5d=4              ! Arc 5 Divisions
  82 a6d=4              ! Arc 6 Divisions
  83 a7d=4              ! Arc 7 Divisions
  84 a8d=4              ! Arc 8 Divisions
  85 a9d=4              ! Arc 9 Divisions
  86 ibtd=2             ! Inner Barrier Thickness Divisions
  87 obitd=2            ! Outer Barrier Inner Thickness Divisions
  88 std=2              ! Skirt Thickness Divisions
  89 /com, Define Element Properties
  90 et,1,solid45       ! Carbon Steel Tube
  91 et,2,solid45       ! Stainless Steel - Boron Plate
  92 et,3,solid45       ! Carbon Steel End Guide
  93 et,4,solid45       ! Carbon Steel Corner Guide
  94 et,5,solid45       ! Alloy 625 Inner Barrier
  95 et,6,solid45       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
  96 !et,6,solid45      ! A 516 Carbon Steel Outer Barrier
  97 !et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
  98 /com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
  99 /com, Room Temperature Properties of Materials
 100 mp,ex,1,206e9       ! A516 Carbon Steel Tube
 101 mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
 102 mp,ex,3,206e9       ! A516 Carbon Steel End Guide
 103 mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
 104 mp,ex,5,208e9       ! Alloy 625 Inner Barrier
 105 mp,ex,6,208e9       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
 106 !mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
 107 !mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
 108 mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
 109 mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
 110 mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
 111 mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
 112 mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
 113 mp,nuxy,6,0.278     ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
 114 !mp,nuxy,6,0.3       ! A516 Carbon Steel Outer Barrier
 115 !mp,nuxy,7,0.3       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
 116 mp,dens,1,8131      ! A516 Carbon Steel Tube
 117 mp,dens,2,89020.33  ! 316B6A Stainless Steel - Boron Plate (Adjusted to include tube and SNF masses)
 118 mp,dens,3,16262     ! A516 Carbon Steel End Guide
 119 mp,dens,4,16262     ! A516 Carbon Steel Corner Guide
 120 mp,dens,5,8442      ! Alloy 625 Inner Barrier
```

```
121 mp,dens,6,440860     ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
122 !mp,dens,6,8131      ! A516 Carbon Steel Outer Barrier
123 !mp,mu,7,0.57        ! Coefficient of Friction (Steel on Steel Assumed)
124 !tb,biso,1
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
126 !tb,biso,2
127 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
128 !tb,biso,3
129 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
130 !tb,biso,4
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
132 !tb,biso,5
133 !tbdata,,379e6,1.271e9  ! Alloy 625
134 !tb,biso,6
135 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
136 !tb,biso,7
137 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
138 /com
139 /com, Define keypoints in the basket assembly
140 csys,0
141 k,1,0,0
142 k,2,pos1,0
143 k,3,pos2,0
144 k,4,pos3,0
145 k,5,pos4,0
146 k,6,pos5,0
147 k,7,pos6,0
148 k,8,pos7,0
149 k,9,pos8,0
150 k,10,pos9,0
151 k,11,pos10,0
152 k,12,pos11,0
153 k,13,pos1,pos1
154 k,14,pos4,pos1
155 k,15,pos5,pos1
156 k,16,pos8,pos1
157 k,17,pos9,pos1
158 k,18,pos2,pos2
159 k,19,pos3,pos2
160 k,20,pos6,pos2
161 k,21,pos7,pos2
162 k,22,pos10,pos2
163 k,23,pos11,posen
164 !k,24,posei,posen
165 csys,1
166 k,24,ibir,(180/pie)*atan(posen/posei)
167 csys,0
168 k,25,pos3,pos3
169 k,26,pos6,pos3
170 k,27,pos7,pos3
171 k,28,pos10,pos3
172 k,29,pos11,posef
173 !k,30,poseo,posef
174 csys,1
175 k,30,ibir,(180/pie)*atan(posef/poseo)
176 csys,0
177 k,31,pos4,pos4
178 k,32,pos5,pos4
179 k,33,pos8,pos4
180 k,34,pos9,pos4
181 k,35,pos5,pos5
182 k,36,pos8,pos5
183 k,37,pos9,pos5
184 !k,38,pos11,poseg
185 csys,1
186 k,38,ibir,(180/pie)*atan(poseg/pos11)
187 csys,0
188 k,39,pos6,pos6
189 k,40,pos7,pos6
190 !k,41,pos10,pos6
```

```
csys,1
k,41,ibir,(180/pie)*atan(pos6/pos10)
csys,0
k,42,posg,posg
!k,43,poscg,posg
csys,1
k,43,ibir,(180/pie)*atan(posg/poscg)
k,44,ibir,0
k,45,ibir,45
k,46,obir,0
k,47,obir,(180/pie)*atan(posen/posei)
k,48,obir,(180/pie)*atan(posef/poseo)
k,49,obir,(180/pie)*atan(poseg/pos11)
k,50,obir,(180/pie)*atan(pos6/pos10)
k,51,obir,(180/pie)*atan(posg/poscg)
k,52,obir,45
k,53,obsr,0
k,54,obsr,(180/pie)*atan(posen/posei)
k,55,obsr,(180/pie)*atan(posef/poseo)
k,56,obsr,(180/pie)*atan(poseg/pos11)
k,57,obsr,(180/pie)*atan(pos6/pos10)
k,58,obsr,(180/pie)*atan(posg/poscg)
k,59,obsr,45
k,60,obor,0
k,61,obor,(180/pie)*atan(posen/posei)
k,62,obor,(180/pie)*atan(posef/poseo)
k,63,obor,(180/pie)*atan(poseg/pos11)
k,64,obor,(180/pie)*atan(pos6/pos10)
k,65,obor,(180/pie)*atan(posg/poscg)
k,66,obor,45
local,11,0,0,0,0,45,0,0,
ksymm,y,all,,,0,0,0
nummrg,kp
csys,0
ksymm,y,all,,,0,0,0
nummrg,kp
kdel,2,12,1
k,1001,0,0,bkht
l,1,1001              ! Line 1 for VDRAG of Basket
lesize,all,,,bd,.2,0
k,2001,0,0,ibht
l,1001,2001           ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
lesize,all,,,gd,1,0
k,3001,0,0,elev1
l,2001,3001           ! Line 3 for VDRAG of Inner Barrier Upper Lid
lesize,all,,,ibld,1,0
k,4001,0,0,elev2
l,3001,4001           ! Line 4 for VDRAG of Lid to Lid Gap
lesize,all,,,gd,1,0
k,5001,0,0,elev3
l,4001,5001           ! Line 5 for VDRAG of Outer Barrier Upper Lid
lesize,all,,,obld,1,0
k,6001,0,0,elev4
l,5001,6001           ! Line 6 for VDRAG of Upper Skirt
lesize,all,,,shd,1,0
k,7001,0,0,-iblt
l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
lesize,all,,,ibld,1,0
k,8001,0,0,elev5
l,7001,8001           ! Line 8 for VDRAG of OB Lower Lid
lesize,all,,,obld,1,0
k,9001,0,0,elev6
l,8001,9001           ! Line 9 for VDRAG of Lower Skirt
lesize,all,,,shd,1,0
/com, line set 1 Tube Width for Half Tubes on Symmetry Plane
L,      197,     206  ! Line 10
L,      196,     205
L,      195,     201
L,      194,     200
L,      193,     204
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 261  L,      192,      203
 262  L,      191,      199
 263  L,      190,      198
 264  L,      189,      202
 265  L,      188,      138
 266  L,      187,      133  ! 20
 267  L,       68,       13
 268  L,       69,       18
 269  L,       70,       85
 270  L,       71,       80
 271  L,       72,       81
 272  L,       73,       86
 273  L,       74,       87
 274  L,       75,       82
 275  L,       76,       83
 276  L,       77,       88  ! 30
 277  L,       78,       89
 278  lesize,all,,,htwd,1,0
 279  /com, line set 2 Tube Widths
 280  L,      211,      218
 281  L,      210,      220
 282  L,      215,      217
 283  L,      214,      216
 284  L,      209,      219
 285  L,      208,      159
 286  L,      213,      155
 287  L,      151,      152
 288  L,      145,      146  ! 40
 289  L,      139,      140
 290  L,      134,      135
 291  L,       14,       15
 292  L,       19,       20
 293  L,       25,       26
 294  L,       31,       32
 295  L,       98,       35
 296  L,       92,       39
 297  L,       93,      106
 298  L,       99,      102  ! 50
 299  L,      100,      103
 300  L,       94,      107
 301  L,       95,      104
 302  lesize,all,,,twd,1,0
 303  /com, line set 3 Tube Widths on End Column
 304  L,      162,      163
 305  L,      160,      161
 306  L,      156,      157
 307  L,      153,      154
 308  L,      147,      148
 309  L,      141,      142
 310  L,      136,      137  ! 60
 311  L,       16,       17
 312  L,       21,       22
 313  L,       27,       28
 314  L,       33,       34
 315  L,       36,       37
 316  L,       40,       41
 317  L,       42,       43
 318  lesize,all,,,twd,1,0
 319  /com, line set 4 Tube Heights
 320  L,      201,      200
 321  L,      205,      204
 322  L,      210,      209  ! 70
 323  L,      215,      214
 324  L,      217,      216
 325  L,      220,      219
 326  L,      221,      162
 327  L,      199,      198
 328  L,      203,      202
 329  L,      208,      145
 330  L,      213,      151
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 331  L,      155,      152
 332  L,      159,      146  ! 80
 333  L,      160,      147
 334  L,      156,      153
 335  L,      157,      154
 336  L,      161,      148
 337  L,      133,       13
 338  L,      138,       18
 339  L,      139,       19
 340  L,      134,       14
 341  L,      135,       15
 342  L,      140,       20  ! 90
 343  L,      141,       21
 344  L,      136,       16
 345  L,      137,       17
 346  L,      142,       22
 347  L,      143,       23
 348  L,       80,       81
 349  L,       85,       86
 350  L,       25,       92
 351  L,       31,       98
 352  L,       32,       35  ! 100
 353  L,       26,       39
 354  L,       27,       40
 355  L,       33,       36
 356  L,       34,       37
 357  L,       28,       41
 358  L,       29,       38
 359  L,       82,       83
 360  L,       87,       88
 361  L,       93,       94
 362  L,       99,      100  ! 110
 363  L,      102,      103
 364  L,      106,      107
 365  L,       42,      109
 366  L,      158,      149
 367  lesize,all,,,thd,1,0
 368  /com, line set 5 End Guide Fins
 369  L,      207,      206
 370  L,      212,      211
 371  L,      150,      149
 372  L,      144,      143
 373  L,       24,       23
 374  L,       30,       29  ! 120
 375  L,       96,       95
 376  L,       90,       89
 377  lesize,all,,,egfd,1,0
 378  /com, line set 6 SS-B Plate Thickress
 379  L,      197,      196
 380  L,      206,      205
 381  L,      211,      210
 382  L,      207,      212
 383  L,      206,      211
 384  L,      205,      210
 385  L,      218,      220
 386  L,      220,      221  ! 130
 387  L,      193,      192
 388  L,      204,      203
 389  L,      209,      208
 390  L,      204,      209
 391  L,      203,      208
 392  L,      219,      159
 393  L,      162,      160
 394  L,      163,      161
 395  L,      161,      158
 396  L,      219,      162  ! 140
 397  L,      159,      160
 398  L,      189,      188
 399  L,      202,      138
 400  L,      145,      139
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401  L,     202,     145
402  L,     138,     139
403  L,     146,     140
404  L,     147,     141
405  L,     146,     147
406  L,     140,     141  ! 150
407  L,     148,     142
408  L,     149,     143
409  L,     148,     149
410  L,     142,     143
411  L,     150,     144
412  L,      69,      70
413  L,      18,      85
414  L,      19,      25
415  L,      18,      19
416  L,      85,      25  ! 160
417  L,      20,      26
418  L,      21,      27
419  L,      20,      21
420  L,      26,      27
421  L,      22,      28
422  L,      22,      23
423  L,      28,      29
424  L,      23,      29
425  L,      24,      30
426  L,      73,      74  ! 170
427  L,      86,      87
428  L,      92,      93
429  L,      86,      92
430  L,      87,      93
431  L,      39,     106
432  L,      40,      42
433  L,      39,      40
434  L,     106,      42
435  L,      38,      41
436  L,      41,      43  ! 180
437  L,      77,      78
438  L,      88,      89
439  L,      94,      95
440  L,      88,      94
441  L,      89,      95
442  L,      90,      96
443  L,     109,     107
444  L,     107,     104
445  L,     224,     225
446  L,     230,     231  ! 190
447  L,     236,     237
448  L,     226,     227
449  L,     227,     228
450  L,     232,     233
451  L,     233,     234
452  L,     238,     239
453  L,     239,     240
454  L,     171,     170
455  L,     170,     169
456  L,     178,     177  ! 200
457  L,     177,     176
458  L,     185,     184
459  L,     184,     183
460  L,     168,     167
461  L,     175,     174
462  L,     182,     181
463  L,      47,      48
464  L,      54,      55
465  L,      61,      62
466  L,      49,      50  ! 210
467  L,      50,      51
468  L,      56,      57
469  L,      57,      58
470  L,      63,      64
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 471  L,      64,      65
 472  L,     117,     116
 473  L,     116,     115
 474  L,     124,     123
 475  L,     123,     122
 476  L,     131,     130  ! 220
 477  L,     130,     129
 478  L,     114,     113
 479  L,     121,     120
 480  L,     128,     127
 481  lesize,all,,,ptd,1,0
 482  /com, line set 7 tube thickness
 483  L,     196,     195
 484  L,     205,     201
 485  L,     204,     200
 486  L,     193,     194
 487  L,     210,     215
 488  L,     220,     217  ! 230
 489  L,     219,     216
 490  L,     209,     214
 491  L,     192,     191
 492  L,     203,     199
 493  L,     202,     198
 494  L,     189,     190
 495  L,     208,     213
 496  L,     159,     155
 497  L,     146,     152
 498  L,     145,     151  ! 240
 499  L,     160,     156
 500  L,     161,     157
 501  L,     148,     154
 502  L,     147,     153
 503  L,     188,     187
 504  L,     138,     133
 505  L,      18,      13
 506  L,      69,      68
 507  L,     139,     134
 508  L,     140,     135  ! 250
 509  L,      20,      15
 510  L,      19,      14
 511  L,     141,     136
 512  L,     142,     137
 513  L,      22,      17
 514  L,      21,      16
 515  L,      70,      71
 516  L,      85,      80
 517  L,      86,      81
 518  L,      73,      72  ! 260
 519  L,      25,      31
 520  L,      26,      32
 521  L,      39,      35
 522  L,      92,      98
 523  L,      27,      33
 524  L,      28,      34
 525  L,      41,      37
 526  L,      40,      36
 527  L,      74,      75
 528  L,      87,      82  ! 270
 529  L,      88,      83
 530  L,      77,      76
 531  L,      93,      99
 532  L,     106,     102
 533  L,     107,     103
 534  L,      94,     100
 535  lesize,all,,,ttd,1,0
 536  csys,1
 537  /com, line set 8, arc 1 bottom
 538  L,     222,     207
 539  L,     223,     224
 540  L,     229,     230
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L,     235,     236  ! 280
lesize,all,,,a1d,1,0
/com, line set 9, arc 2 side arcs
L,     212,     218
L,     225,     226
L,     231,     232
L,     237,     238
lesize,all,,,a2d,1,0
/com, line set 10, arc 3 side arcs
L,     221,     163
L,     228,     171
L,     234,     178
L,     240,     185
lesize,all,,,a3d,1,0
/com, line set 11, arc 4 side arcs
L,     158,     150
L,     169,     168  ! 290
L,     176,     175
L,     183,     182
lesize,all,,,a4d,1,0
/com, line set 12, arc 5 side arcs
L,     144,      24
L,     167,      47
L,     174,      54
L,     181,      61
lesize,all,,,a5d,1,0
/com, line set 13, arc 6 side arcs
L,      30,      38
L,      48,      49
L,      55,      56
L,      62,      63  ! 300
lesize,all,,,a6d,1,0
/com, line set 14, arc 7 side arcs
L,      43,     109
L,      51,     117
L,      58,     124
L,      65,     131
lesize,all,,,a7d,1,0
/com, line set 15, arc 8 side arcs
L,     104,      96
L,     115,     114
L,     122,     121
L,     129,     128
lesize,all,,,a8d,1,0
/com, line set 16, arc 9 top arcs
L,      90,     110
L,     113,     112  ! 310
L,     120,     119
L,     127,     126
lesize,all,,,a9d,1,0
csys,0
/com, line set 17 IB thickness
L,     222,     223
L,     207,     224
L,     212,     225
L,     218,     226
L,     220,     227
L,     221,     228
L,     163,     171
L,     161,     170  ! 320
L,     158,     169
L,     150,     168
L,     144,     167
L,      24,      47
L,      30,      48
L,      38,      49
L,      41,      50
L,      43,      51
L,     109,     117
L,     107,     116  ! 330
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611  L,      104,      115
612  L,       96,      114
613  L,       90,      113
614  L,      110,      112
615  lesize,all,,,ibtd,1,0
616  /com, line set 18 OB inner thickness
617  L,      223,      229
618  L,      224,      230
619  L,      225,      231
620  L,      226,      232
621  L,      227,      233
622  L,      228,      234  ! 340
623  L,      171,      178
624  L,      170,      177
625  L,      169,      176
626  L,      168,      175
627  L,      167,      174
628  L,       47,       54
629  L,       48,       55
630  L,       49,       56
631  L,       50,       57
632  L,       51,       58  ! 350
633  L,      117,      124
634  L,      116,      123
635  L,      115,      122
636  L,      114,      121
637  L,      113,      120
638  L,      112,      119
639  lesize,all,,,obitd,1,0
640  /com, line set 19 skirt thickness
641  L,      229,      235
642  L,      230,      236
643  L,      231,      237
644  L,      232,      238  ! 360
645  L,      233,      239
646  L,      234,      240
647  L,      178,      185
648  L,      177,      184
649  L,      176,      183
650  L,      175,      182
651  L,      174,      181
652  L,       54,       61
653  L,       55,       62
654  L,       56,       63  ! 370
655  L,       57,       64
656  L,       58,       65
657  L,      124,      131
658  L,      123,      130
659  L,      122,      129
660  L,      121,      128
661  L,      120,      127
662  L,      119,      126
663  lesize,all,,,std,1,0
664  /com, lines to fill in lids
665  /com, lines tube height
666  l,195,194             ! 379
667  l,191,190             ! 380
668  l,187,68              ! 381
669  l,71,72               ! 382
670  l,75,76               ! 383
671  lesize,all,,,thd,1,0
672  /com, end lines
673  l,222,197             ! 384
674  l,78,110              ! 385
675  lesize,all,,,egfd,1,0
676  /com, area set 1, tubes
677  a,195,196,205,201
678  a,200,201,205,204
679  a,193,194,200,204
680  a,191,192,203,199
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a,198,199,203,202
a,189,190,198,202
a,187,188,138,133
a,133,138,18,13
a,69,68,13,18
a,71,70,85,80
a,80,85,86,81
a,73,72,81,86
a,75,74,87,82
a,82,87,88,83
a,77,76,83,88
a,209,210,215,214
a,215,210,220,217
a,216,217,220,219
a,209,214,216,219
a,145,208,213,151
a,213,208,159,155
a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
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a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
a,159,219,162,160
a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
!a,223,229,230,224
!a,224,230,231,225
!a,225,231,232,226
!a,226,232,233,227
!a,227,233,234,228
!a,228,234,178,171
!a,171,178,177,170
!a,170,177,176,169
!a,169,176,175,168
!a,168,175,174,167
!a,167,174,54,47
!a,47,54,55,48
!a,48,55,56,49
!a,49,56,57,50
!a,50,57,58,51
!a,51,58,124,117
!a,117,124,123,116
!a,116,123,122,115
!a,115,122,121,114
!a,114,121,120,113
!a,113,120,119,112
!a,229,235,236,230
!a,236,237,231,230
!a,231,237,238,232
!a,238,239,233,232
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!a,239,240,234,233
!a,240,185,178,234
!a,185,184,177,178
!a,184,183,176,177
!a,176,183,182,175
!a,175,182,181,174
!a,174,181,61,54
!a,54,61,62,55
!a,55,62,63,56
!a,56,63,64,57
!a,57,64,65,58
!a,58,65,131,124
!a,124,131,130,123
!a,123,130,129,122
!a,122,129,128,121
!a,121,128,127,120
!a,120,127,126,119
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.01
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,0.01
nummrg,kp
/com, generate lines to fill in lid at top of WP
/com, lines tube height
L,414,421  ! 1121
L,422,429  ! 1124
L,430,437  ! 1125
L,438,445  ! 1131
L,446,453  ! 1138
lesize,all,,,thd,1,0
/com, end lines
L,370,518  ! 1141
L,539,413  ! 1151
lesize,all,,,egfd,1,0
al,832,1116,1120,1141
al,936,937,941,1121
al,946,947,951,1124
al,956,959,961,1125
al,966,969,971,1131
al,976,979,981,1138
al,932,1143,1147,1151
al,842,1122,1123
al,985,989,990,993
al,997,1001,1002,1005
al,1010,1013,1015,1018
al,1021,1025,1028,1029
al,1033,1037,1040,1041
al,922,1144,1148
al,857,1153,1156
al,1046,1049,1051,1054
al,1058,1061,1063,1066
al,1070,1073,1075,1078
al,907,1159,1163
al,872,1126,1130
al,882,1132,1133,1137
al,892,1139,1140
asel,s,loc,z,ibht+0.01
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
!asel,s,loc,z,elev1+0.015
!csys,1
!asel,r,loc,x,obir,obor
```

```
!csys,0
!vdrag,all,,,,,,4          ! Drag Lid to Lid Gap
!asel,s,loc,z,elev1+0.015
!asel,r,loc,z,elev1-0.015
!csys,1
!asel,r,loc,x,0,obir
!csys,0
!agen,2,all,,,,,ltlgh
!nummrg,kp
!asel,s,loc,z,elev2+0.015
!vdrag,all,,,,,,5          ! Drag Outer Barrier Upper Lid
!asel,s,loc,z,elev3
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,6          ! Drag Upper Skirt
/com, lines at bottom lid used to be here
!al,10,115,277,384
!al,12,13,68,379
!al,16,17,75,380
!al,20,21,85,381
!al,24,25,96,382
!al,28,29,107,383
!al,31,122,309,385
!al,32,116,281
!al,34,35,71,72
!al,38,39,78,79
!al,42,43,88,89
!al,46,47,99,100
!al,50,51,110,111
!al,53,121,305
!al,54,74,285
!al,56,57,82,83
!al,60,61,92,93
!al,64,65,103,104
!al,67,113,301
!al,114,117,289
!al,95,118,119,293
!al,106,120,297
!asel,s,loc,z,0
!vdrag,all,,,,,,7          ! Drag Inner Barrier Lower Lid
!csys,0
!asel,s,loc,z,-iblt
!vdrag,all,,,,,,8          ! Drag Outer Barrier Lower Lid
!asel,s,loc,z,elev5
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
!vsel,s,volu,,1,47
!type,1
!mat,1
!vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
```

```
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,0,elev1
csys,1
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
vsel,u,loc,x,ibir-0.02,obir
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,loc,x,obir,obor
vsel,r,loc,z,-iblt,elev1
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Upper Inner Barrier Adding Backfill Mass
vsel,inve
csys,1
vsel,u,loc,x,obir,obor
vsel,r,loc,z,0,elev1
vsel,u,volu,,1,92
csys,0
type,6
mat,6
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
!vsel,inve
!vsel,u,volu,,1,92
!csys,1
!vsel,u,loc,x,obir,obor
!vsel,a,loc,y,-90,5
!vsel,u,volu,,1,92
!vsel,u,type,,5
!type,6
!mat,6
!vmesh,all
/com, mesh upper outer barrier adding backfill mass
!vsel,inve
!vsel,u,type,,1,5
!type,7
!mat,7
!vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
nsel,s,loc,z,0
dsym,symm,z,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(7*bkht/bd),(10*bkht/bd)+0.02
nsel,r,loc,x,obir-0.001,obir+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini
```

```
 1031
 1032  /sol
 1033  expass,on
 1034  mxpand,8,,,yes
 1035  solve
 1036  fini
 1037
 1038  /sol
 1039  antype,spectr
 1040  spopt,sprs,,on
 1041  sed,,1
 1042  svtyp,2
 1043  freq,0.1,100
 1044  sv,,16.285,16.285
 1045  mcomb,srss,1e-8
 1046  outres,all,1
 1047  save
 1048  solve
 1049  fini
 1050  /exit
 1051  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ****************************************************************
   ANSYS STARTUP FILE  start.ans
   ****************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,
```

```
ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ********************************************************************
   END  start.ans
   ********************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ********************************************************************
**************************************************************************
**************************************************************************
*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
*****  Degree of Degradation in Outer Barrier: 100%                   *****
*****  Degree of Degradation in Inner Barrier:  75%                   *****
*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
*****                                             Guides 50%          *****
*****                                             SS-B Plates 0%      *****
*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
*****  Quarter Symmetry Model                                         *****
**************************************************************************
**************************************************************************
**************************************************************************


NUMBER OF DATA BASE PAGES IN MEMORY     (NVPAGE)=       512

SI UNITS SPECIFIED FOR INTERNAL
 LENGTH         (l)  = METER(M)
 MASS           (M)  = KILOGRAM(KG)
 TIME           (t)  = SECOND(SEC)
 TEMPERATURE    (T)  = KELVIN(K)
 TOFFSET             = 0.0 KELVIN
 CHARGE         (Q)  = COULOMB
 CURRENT        (i)  = AMPERE (COULOMBS/SEC)
 FORCE          (f)  = NEWTON(N) (KG-M/SEC2)
 PRESSURE            = PASCAL (NEWTON/M**2)
 ENERGY         (W)  = JOULE (N-M)
 POWER          (P)  = WATT (N-M/SEC)
 CAPACITANCE    (C)  = FARAD
 INDUCTANCE     (L)  = HENRY
 MAGNETIC FLUX       = WEBER
 RESISTANCE     (R)  = OHM
 ELECTRIC POTENTIAL = VOLT

INPUT UNITS ARE ALSO SET TO SI
```

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 15:52:46 APR 09, 1996 CP= 0.380
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

***** ANSYS ANALYSIS DEFINITION (PREP7) *****

TITLE=
21 PWR Tube Seismic Analysis With Backfill

VIEW CONE ANGLE FOR WINDOW 1 0.00
Define Parameters

PARAMETER IBIR = 0.7109500

PARAMETER OBIR = 0.7159500

PARAMETER OBSR = 0.7709500

PARAMETER OBOR = 0.7809500

PARAMETER TS1 = 0.7000000E-02

PARAMETER TS2 = 0.5000000E-02

PARAMETER TS3 = 0.5000000E-02

PARAMETER TS4 = 0.5000000E-02

PARAMETER EGIH = 0.8550000E-01

PARAMETER PIE = 3.141593

PARAMETER ANG1 = 0.5235988

PARAMETER ANG2 = 1.396263

PARAMETER ANG3 = 1.012291

PARAMETER TW = 0.2285000

PARAMETER POS1 = 0.1142500

PARAMETER POS2 = 0.1192500

PARAMETER POS3 = 0.1262500

PARAMETER POS4 = 0.1312500

PARAMETER POS5 = 0.3597500

PARAMETER POS6 = 0.3647500

PARAMETER POS7 = 0.3717500

PARAMETER POS8 = 0.3767500

PARAMETER POS9 = 0.6052500

PARAMETER POS10 = 0.6102500

PARAMETER POS11 = 0.6152500

PARAMETER POSG = 0.3697500

PARAMETER POSEI = 0.7007500

PARAMETER POSEO = 0.6998684

PARAMETER POSEN = 0.1202500

PARAMETER POSEF = 0.1252500

PARAMETER POSEG = 0.3560897

PARAMETER POSCG = 0.6071257

PARAMETER BKHT = 2.287500

PARAMETER IBHT = 2.297500

PARAMETER IBLT = 0.1000000E-01

PARAMETER ELEV1 = 2.307500

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 2.337500

PARAMETER OBLT = 0.6000000E-01

PARAMETER ELEV3 = 2.397500

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 2.622500

PARAMETER ELEV5 = -0.7000000E-01

PARAMETER ELEV6 = -0.2950000

Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 2.000000

PARAMETER IBLD = 2.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 2.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

PARAMETER A3D = 4.000000

PARAMETER A4D = 4.000000

PARAMETER A5D = 4.000000

PARAMETER A6D = 4.000000

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PARAMETER A7D      =     4.000000

PARAMETER A8D      =     4.000000

PARAMETER A9D      =     4.000000

PARAMETER IBTD     =     2.000000

PARAMETER OBITD    =     2.000000

PARAMETER STD      =     2.000000
 Define Element Properties

ELEMENT TYPE    1 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    2 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    3 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    4 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    5 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    6 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL
 ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
 Room Temperature Properties of Materials

MATERIAL    1          EX   =   0.2060000E+12

MATERIAL    2          EX   =   0.1950000E+12

MATERIAL    3          EX   =   0.2060000E+12

MATERIAL    4          EX   =   0.2060000E+12

MATERIAL    5          EX   =   0.2080000E+12

MATERIAL    6          EX   =   0.2080000E+12

MATERIAL    1          NUXY =   0.3000000

MATERIAL    2          NUXY =   0.2980000

MATERIAL    3          NUXY =   0.3000000
```

```
MATERIAL    4          NUXY =   0.3000000
MATERIAL    5          NUXY =   0.2780000
MATERIAL    6          NUXY =   0.2780000
MATERIAL    1          DENS =    8131.000
MATERIAL    2          DENS =    89020.33
MATERIAL    3          DENS =    16262.00
MATERIAL    4          DENS =    16262.00
MATERIAL    5          DENS =    8442.000
MATERIAL    6          DENS =    440860.0
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1  X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2  X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3  X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4  X,Y,Z=  0.126250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5  X,Y,Z=  0.131250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6  X,Y,Z=  0.359750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7  X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8  X,Y,Z=  0.371750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9  X,Y,Z=  0.376750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10  X,Y,Z=  0.605250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11  X,Y,Z=  0.610250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12  X,Y,Z=  0.615250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13  X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14  X,Y,Z=  0.131250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15  X,Y,Z=  0.359750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16  X,Y,Z=  0.376750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17  X,Y,Z=  0.605250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18  X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19  X,Y,Z=  0.126250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20  X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     21  X,Y,Z=  0.371750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     22  X,Y,Z=  0.610250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     23  X,Y,Z=  0.615250      0.120250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

```
KEYPOINT     24  X,Y,Z=  0.710950       9.73722       0.000000E+00  IN CSYS=  1
                      0.700708      0.120243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     25  X,Y,Z=  0.126250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     26  X,Y,Z=  0.364750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     27  X,Y,Z=  0.371750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     28  X,Y,Z=  0.610250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     29  X,Y,Z=  0.615250      0.125250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     30  X,Y,Z=  0.710950       10.1464       0.000000E+00  IN CSYS=  1
                      0.699831      0.125243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     31  X,Y,Z=  0.131250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     32  X,Y,Z=  0.359750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     33  X,Y,Z=  0.376750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     34  X,Y,Z=  0.605250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     35  X,Y,Z=  0.359750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     36  X,Y,Z=  0.376750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     37  X,Y,Z=  0.605250      0.359750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     38  X,Y,Z=  0.710950       30.0611       0.000000E+00  IN CSYS=  1
                      0.615321      0.356131      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     39  X,Y,Z=  0.364750      0.364750      0.000000E+00  IN CSYS=  0
KEYPOINT     40  X,Y,Z=  0.371750      0.364750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     41  X,Y,Z=  0.710950       30.8670       0.000000E+00  IN CSYS=  1
                      0.610251      0.364751      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     42  X,Y,Z=  0.369750      0.369750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     43  X,Y,Z=  0.710950       31.3421       0.000000E+00  IN CSYS=  1
                      0.607206      0.369799      0.000000E+00  IN CSYS=  0
KEYPOINT     44  X,Y,Z=  0.710950      0.000000E+00  0.000000E+00  IN CSYS=  1
                      0.710950      0.000000E+00  0.000000E+00  IN CSYS=  0
```

KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0

KEYPOINT 46 X,Y,Z= 0.715950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.715950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 47 X,Y,Z= 0.715950 9.73722 0.000000E+00 IN CSYS= 1
0.705636 0.121088 0.000000E+00 IN CSYS= 0

KEYPOINT 48 X,Y,Z= 0.715950 10.1464 0.000000E+00 IN CSYS= 1
0.704753 0.126124 0.000000E+00 IN CSYS= 0

KEYPOINT 49 X,Y,Z= 0.715950 30.0611 0.000000E+00 IN CSYS= 1
0.619649 0.358636 0.000000E+00 IN CSYS= 0

KEYPOINT 50 X,Y,Z= 0.715950 30.8670 0.000000E+00 IN CSYS= 1
0.614543 0.367316 0.000000E+00 IN CSYS= 0

KEYPOINT 51 X,Y,Z= 0.715950 31.3421 0.000000E+00 IN CSYS= 1
0.611476 0.372400 0.000000E+00 IN CSYS= 0

KEYPOINT 52 X,Y,Z= 0.715950 45.0000 0.000000E+00 IN CSYS= 1
0.506253 0.506253 0.000000E+00 IN CSYS= 0

KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 54 X,Y,Z= 0.770950 9.73722 0.000000E+00 IN CSYS= 1
0.759844 0.130391 0.000000E+00 IN CSYS= 0

KEYPOINT 55 X,Y,Z= 0.770950 10.1464 0.000000E+00 IN CSYS= 1
0.758893 0.135813 0.000000E+00 IN CSYS= 0

KEYPOINT 56 X,Y,Z= 0.770950 30.0611 0.000000E+00 IN CSYS= 1
0.667251 0.386186 0.000000E+00 IN CSYS= 0

KEYPOINT 57 X,Y,Z= 0.770950 30.8670 0.000000E+00 IN CSYS= 1
0.661753 0.395534 0.000000E+00 IN CSYS= 0

KEYPOINT 58 X,Y,Z= 0.770950 31.3421 0.000000E+00 IN CSYS= 1
0.658450 0.401008 0.000000E+00 IN CSYS= 0

KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0

KEYPOINT 60 X,Y,Z= 0.780950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.780950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 61 X,Y,Z= 0.780950 9.73722 0.000000E+00 IN CSYS= 1
0.769699 0.132082 0.000000E+00 IN CSYS= 0

KEYPOINT 62 X,Y,Z= 0.780950 10.1464 0.000000E+00 IN CSYS= 1

```
                    0.768737      0.137575      0.000000E+00  IN CSYS=  0

KEYPOINT     63   X,Y,Z=  0.780950       30.0611       0.000000E+00  IN CSYS=  1

                    0.675906      0.391196      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.780950       30.8670       0.000000E+00  IN CSYS=  1

                    0.670337      0.400664      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.780950       31.3421       0.000000E+00  IN CSYS=  1

                    0.666991      0.406209      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.780950       45.0000       0.000000E+00  IN CSYS=  1

                    0.552215      0.552215      0.000000E+00  IN CSYS=  0

COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
  XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
  ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
  ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT     13 USED FOR KEYPOINT(S)      79
KEYPOINT     18 USED FOR KEYPOINT(S)      84
KEYPOINT     25 USED FOR KEYPOINT(S)      91
KEYPOINT     31 USED FOR KEYPOINT(S)      97
KEYPOINT     35 USED FOR KEYPOINT(S)     101
KEYPOINT     39 USED FOR KEYPOINT(S)     105
KEYPOINT     42 USED FOR KEYPOINT(S)     108
KEYPOINT     45 USED FOR KEYPOINT(S)     111
KEYPOINT     52 USED FOR KEYPOINT(S)     118
KEYPOINT     59 USED FOR KEYPOINT(S)     125
KEYPOINT     66 USED FOR KEYPOINT(S)     132

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT      2 USED FOR KEYPOINT(S)      79
KEYPOINT      3 USED FOR KEYPOINT(S)      84
KEYPOINT      4 USED FOR KEYPOINT(S)      91
KEYPOINT      5 USED FOR KEYPOINT(S)      97
KEYPOINT      6 USED FOR KEYPOINT(S)     101
KEYPOINT      7 USED FOR KEYPOINT(S)     105
KEYPOINT      8 USED FOR KEYPOINT(S)     108
KEYPOINT      9 USED FOR KEYPOINT(S)     111
KEYPOINT     10 USED FOR KEYPOINT(S)     118
KEYPOINT     11 USED FOR KEYPOINT(S)     125
KEYPOINT     12 USED FOR KEYPOINT(S)     132
KEYPOINT     44 USED FOR KEYPOINT(S)     164
KEYPOINT     46 USED FOR KEYPOINT(S)     166
KEYPOINT     53 USED FOR KEYPOINT(S)     173
KEYPOINT     60 USED FOR KEYPOINT(S)     180

DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY     1

KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   2.28750      IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  1001
```

```
 LINE NO.=     1 KP1=      1  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   1001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =   15,  SPACING RATIO =   0.200

KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   2.29750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   1001  2001
 LINE NO.=     2  KP1=   1001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   2001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   2.30750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   2001  3001
 LINE NO.=     3  KP1=   2001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   3001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   2.33750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   3001  4001
 LINE NO.=     4  KP1=   3001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   4001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   2.39750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   4001  5001
 LINE NO.=     5  KP1=   4001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   5001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   2.62250      IN CSYS=  0

LINE CONNECTS KEYPOINTS   5001  6001
 LINE NO.=     6  KP1=   5001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=   6001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.100000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  7001
 LINE NO.=     7  KP1=      1  TAN1=    0.0000   0.0000   1.0000
                 KP2=   7001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.700000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000   0.0000   1.0000
                 KP2=   8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.295000      IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     72    81
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```
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     81  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      73    86
 LINE NO.=    26  KP1=     73  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     86  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      74    87
 LINE NO.=    27  KP1=     74  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     87  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      75    82
 LINE NO.=    28  KP1=     75  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     82  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      76    83
 LINE NO.=    29  KP1=     76  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     83  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      77    88
 LINE NO.=    30  KP1=     77  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     88  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      78    89
 LINE NO.=    31  KP1=     78  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     89  TAN2=    1.0000    0.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 2 Tube Widths

LINE CONNECTS KEYPOINTS     211   218
 LINE NO.=    32  KP1=    211  TAN1=   -1.0000    0.0003    0.0000
                  KP2=    218  TAN2=    1.0000   -0.0003    0.0000

LINE CONNECTS KEYPOINTS     210   220
 LINE NO.=    33  KP1=    210  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    220  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     215   217
 LINE NO.=    34  KP1=    215  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    217  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     214   216
 LINE NO.=    35  KP1=    214  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    216  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     209   219
 LINE NO.=    36  KP1=    209  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    219  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     208   159
 LINE NO.=    37  KP1=    208  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    159  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     213   155
 LINE NO.=    38  KP1=    213  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    155  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     151   152
 LINE NO.=    39  KP1=    151  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    152  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     145   146
 LINE NO.=    40  KP1=    145  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    146  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     139   140
 LINE NO.=    41  KP1=    139  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    140  TAN2=    1.0000    0.0000    0.0000
```

```
LINE CONNECTS KEYPOINTS    134   135
 LINE NO.=    42  KP1=    134  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    135  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     14    15
 LINE NO.=    43  KP1=     14  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     15  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     19    20
 LINE NO.=    44  KP1=     19  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     20  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     25    26
 LINE NO.=    45  KP1=     25  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     26  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     31    32
 LINE NO.=    46  KP1=     31  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     32  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     98    35
 LINE NO.=    47  KP1=     98  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     35  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     92    39
 LINE NO.=    48  KP1=     92  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     39  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     93   106
 LINE NO.=    49  KP1=     93  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    106  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     99   102
 LINE NO.=    50  KP1=     99  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    102  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    100   103
 LINE NO.=    51  KP1=    100  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    103  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     94   107
 LINE NO.=    52  KP1=     94  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    107  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     95   104
 LINE NO.=    53  KP1=     95  TAN1=   -1.0000   -0.0003    0.0000
                  KP2=    104  TAN2=    1.0000    0.0003    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 3 Tube Widths on End Column

LINE CONNECTS KEYPOINTS    162   163
 LINE NO.=    54  KP1=    162  TAN1=   -1.0000    0.0002    0.0000
                  KP2=    163  TAN2=    1.0000   -0.0002    0.0000

LINE CONNECTS KEYPOINTS    160   161
 LINE NO.=    55  KP1=    160  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    161  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    156   157
 LINE NO.=    56  KP1=    156  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    157  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    153   154
 LINE NO.=    57  KP1=    153  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    154  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    147   148
```

```
 LINE NO.=    58  KP1=    147  TAN1=   -'.0000   0.0000   0.0000
                  KP2=    148  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -'.0000   0.0000   0.0000
                  KP2=    142  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -'.0000   0.0000   0.0000
                  KP2=    137  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -'.0000   0.0000   0.0000
                  KP2=     17  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -'.0000   0.0000   0.0000
                  KP2=     22  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -'.0000   0.0000   0.0000
                  KP2=     28  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -'.0000   0.0000   0.0000
                  KP2=     34  TAN2=    '.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     37  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     41  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -1.0000  -0.0002   0.0000
                  KP2=     43  TAN2=    1.0000   0.0002   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    200  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    204  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    209  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    214  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    216  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=    220  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    219  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=    221  TAN1=    0.0002  -1.0000   0.0000
                  KP2=    162  TAN2=   -0.0002   1.0000   0.0000
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```
LINE CONNECTS KEYPOINTS    199   198
 LINE NO.=    75  KP1=    199  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    198  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=    76  KP1=    203  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    202  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=    77  KP1=    208  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    145  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=    78  KP1=    213  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    151  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=    79  KP1=    155  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    152  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=    80  KP1=    159  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    146  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=    81  KP1=    160  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    147  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=    82  KP1=    156  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    153  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=    83  KP1=    157  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    154  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=    84  KP1=    161  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    148  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=    85  KP1=    133  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     13  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=    86  KP1=    138  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     18  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=    87  KP1=    139  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     19  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=    88  KP1=    134  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     14  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=    89  KP1=    135  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     15  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
 LINE NO.=    90  KP1=    140  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     20  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    141    21
 LINE NO.=    91  KP1=    141  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     21  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    136    16
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```
 LINE NO.=    92 KP1=    136 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     16 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=    93 KP1=    137 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     17 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=    94 KP1=    142 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     22 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=    95 KP1=    143 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     23 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=    96 KP1=     80 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     81 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=    97 KP1=     85 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     86 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=    98 KP1=     25 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     92 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=    99 KP1=     31 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     98 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=   100 KP1=     32 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     35 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=   101 KP1=     26 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     39 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=   102 KP1=     27 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     40 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=   103 KP1=     33 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     36 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=   104 KP1=     34 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     37 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=   105 KP1=     28 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     41 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=   106 KP1=     29 TAN1=   -0.0003  -1.0000   0.0000
                 KP2=     38 TAN2=    0.0003   1.0000   0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=   107 KP1=     82 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     83 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=   108 KP1=     87 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     88 TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=   109 KP1=     93 TAN1=    0.0000  -1.0000   0.0000
                 KP2=     94 TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS     99   100
 LINE NO.=   110  KP1=      99  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     100  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=   111  KP1=     102  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     103  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=   112  KP1=     106  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     107  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=   113  KP1=      42  TAN1=    -0.0002  -1.0000   0.0000
                  KP2=     109  TAN2=     0.0002   1.0000   0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=   114  KP1=     158  TAN1=     0.0003  -1.0000   0.0000
                  KP2=     149  TAN2=    -0.0003   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=   115  KP1=     207  TAN1=    -0.0001  -1.0000   0.0000
                  KP2=     206  TAN2=     0.0001   1.0000   0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=   116  KP1=     212  TAN1=    -0.0001  -1.0000   0.0000
                  KP2=     211  TAN2=     0.0001   1.0000   0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=   117  KP1=     150  TAN1=     1.0000   0.0001   0.0000
                  KP2=     149  TAN2=    -1.0000  -0.0001   0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=   118  KP1=     144  TAN1=     1.0000   0.0001   0.0000
                  KP2=     143  TAN2=    -1.0000  -0.0001   0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=   119  KP1=      24  TAN1=     1.0000  -0.0001   0.0000
                  KP2=      23  TAN2=    -1.0000   0.0001   0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=   120  KP1=      30  TAN1=     1.0000  -0.0001   0.0000
                  KP2=      29  TAN2=    -1.0000   0.0001   0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=   121  KP1=      96  TAN1=    -0.0001   1.0000   0.0000
                  KP2=      95  TAN2=     0.0001  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=   122  KP1=      90  TAN1=    -0.0001   1.0000   0.0000
                  KP2=      89  TAN2=     0.0001  -1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
 LINE NO.=   123  KP1=     197  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     196  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    206   205
 LINE NO.=   124  KP1=     206  TAN1=     0.1961  -0.9806   0.0000
                  KP2=     205  TAN2=    -0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS    211   210
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 LINE NO.=   125  KP1=    211  TAN1=   -0.1961  -0.9806   0.0000
                  KP2=    210  TAN2=    0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS    207   212
 LINE NO.=   126  KP1=    207  TAN1=   -0.9850  -0.1726   0.0000
                  KP2=    212  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    206   211
 LINE NO.=   127  KP1=    206  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    211  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    205   210
 LINE NO.=   128  KP1=    205  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    210  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    218   220
 LINE NO.=   129  KP1=    218  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=    220  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    220   221
 LINE NO.=   130  KP1=    220  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    221  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    193   192
 LINE NO.=   131  KP1=    193  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    192  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   203
 LINE NO.=   132  KP1=    204  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    203  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    209   208
 LINE NO.=   133  KP1=    209  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    208  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   209
 LINE NO.=   134  KP1=    204  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    209  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    203   208
 LINE NO.=   135  KP1=    203  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    208  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    219   159
 LINE NO.=   136  KP1=    219  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    159  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    162   160
 LINE NO.=   137  KP1=    162  TAN1=   -0.3714  -0.9285   0.0000
                  KP2=    160  TAN2=    0.3714   0.9285   0.0000

LINE CONNECTS KEYPOINTS    163   161
 LINE NO.=   138  KP1=    163  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    161  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    161   158
 LINE NO.=   139  KP1=    161  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    158  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    219   162
 LINE NO.=   140  KP1=    219  TAN1=   -0.9285  -0.3714   0.0000
                  KP2=    162  TAN2=    0.9285   0.3714   0.0000

LINE CONNECTS KEYPOINTS    159   160
 LINE NO.=   141  KP1=    159  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    160  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   188
 LINE NO.=   142  KP1=    189  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    188  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS    202   138
 LINE NO.=   143  KP1=     202  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     138  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=     145  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     139  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=     202  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     145  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=     138  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     139  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=     146  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     140  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=     147  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     141  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=     146  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     147  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=     140  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     141  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=     148  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     142  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=     149  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     143  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=     148  TAN1=   -0.9806   -0.1961    0.0000
                  KP2=     149  TAN2=    0.9806    0.1961    0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=     142  TAN1=   -0.9806    0.1961    0.0000
                  KP2=     143  TAN2=    0.9806   -0.1961    0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=     150  TAN1=   -0.1726   -0.9850    0.0000
                  KP2=     144  TAN2=    0.1726    0.9850    0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=      69  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      70  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=      18  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      85  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     19    25
 LINE NO.=   158  KP1=      19  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      25  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=      18  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      19  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     85    25
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 LINE NO.=   160  KP1=     85  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     25  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     20    26
 LINE NO.=   161  KP1=     20  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     26  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     21    27
 LINE NO.=   162  KP1=     21  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     27  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     20    21
 LINE NO.=   163  KP1=     20  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     21  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     26    27
 LINE NO.=   164  KP1=     26  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     27  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     22    28
 LINE NO.=   165  KP1=     22  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     28  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     22    23
 LINE NO.=   166  KP1=     22  TAN1=   -0.9806   -0.1961    0.0000
                  KP2=     23  TAN2=    0.9806    0.1961    0.0000

LINE CONNECTS KEYPOINTS     28    29
 LINE NO.=   167  KP1=     28  TAN1=   -0.9806    0.1961    0.0000
                  KP2=     29  TAN2=    0.9806   -0.1961    0.0000

LINE CONNECTS KEYPOINTS     23    29
 LINE NO.=   168  KP1=     23  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     29  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     24    30
 LINE NO.=   169  KP1=     24  TAN1=    0.1726   -0.9850    0.0000
                  KP2=     30  TAN2=   -0.1726    0.9850    0.0000

LINE CONNECTS KEYPOINTS     73    74
 LINE NO.=   170  KP1=     73  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     74  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     86    87
 LINE NO.=   171  KP1=     86  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     87  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     92    93
 LINE NO.=   172  KP1=     92  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     93  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     86    92
 LINE NO.=   173  KP1=     86  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     92  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     87    93
 LINE NO.=   174  KP1=     87  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     93  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     39   106
 LINE NO.=   175  KP1=     39  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    106  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     40    42
 LINE NO.=   176  KP1=     40  TAN1=    0.3714   -0.9285    0.0000
                  KP2=     42  TAN2=   -0.3714    0.9285    0.0000

LINE CONNECTS KEYPOINTS     39    40
 LINE NO.=   177  KP1=     39  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     40  TAN2=    1.0000    0.0000    0.0000
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LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=   178  KP1=     106  TAN1=   -0.9285   0.3714   0.0000
                  KP2=      42  TAN2=    0.9285  -0.3714   0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=   179  KP1=      38  TAN1=    0.5070  -0.8619   0.0000
                  KP2=      41  TAN2=   -0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=   180  KP1=      41  TAN1=    0.5166  -0.8562   0.0000
                  KP2=      43  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=   181  KP1=      77  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      78  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=   182  KP1=      88  TAN1=   -0.1961  -0.9806   0.0000
                  KP2=      89  TAN2=    0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=   183  KP1=      94  TAN1=    0.1961  -0.9806   0.0000
                  KP2=      95  TAN2=   -0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=   184  KP1=      88  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      94  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=   185  KP1=      89  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      95  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=   186  KP1=      90  TAN1=   -0.9850   0.1726   0.0000
                  KP2=      96  TAN2=    0.9850  -0.1726   0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=   187  KP1=     109  TAN1=    0.8562  -0.5166   0.0000
                  KP2=     107  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=   188  KP1=     107  TAN1=    0.8619  -0.5070   0.0000
                  KP2=     104  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=   189  KP1=     224  TAN1=   -0.9850  -0.1726   0.0000
                  KP2=     225  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=   190  KP1=     230  TAN1=   -0.9850  -0.1726   0.0000
                  KP2=     231  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=   191  KP1=     236  TAN1=   -0.9850  -0.1726   0.0000
                  KP2=     237  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=   192  KP1=     226  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=     227  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    227   228
 LINE NO.=   193  KP1=     227  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=     228  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    232   233
 LINE NO.=   194  KP1=     232  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=     233  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    233   234
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LINE NO.=	195	KP1=	233	TAN1=	-0.8562 -0.5166	0.0000
		KP2=	234	TAN2=	0.8562 0.5166	0.0000
LINE CONNECTS KEYPOINTS			238	239		
LINE NO.=	196	KP1=	238	TAN1=	-0.8619 -0.5070	0.0000
		KP2=	239	TAN2=	0.8619 0.5070	0.0000
LINE CONNECTS KEYPOINTS			239	240		
LINE NO.=	197	KP1=	239	TAN1=	-0.8562 -0.5166	0.0000
		KP2=	240	TAN2=	0.8562 0.5166	0.0000
LINE CONNECTS KEYPOINTS			171	170		
LINE NO.=	198	KP1=	171	TAN1=	-0.5166 -0.8562	0.0000
		KP2=	170	TAN2=	0.5166 0.8562	0.0000
LINE CONNECTS KEYPOINTS			170	169		
LINE NO.=	199	KP1=	170	TAN1=	-0.5070 -0.8619	0.0000
		KP2=	169	TAN2=	0.5070 0.8619	0.0000
LINE CONNECTS KEYPOINTS			178	177		
LINE NO.=	200	KP1=	178	TAN1=	-0.5166 -0.8562	0.0000
		KP2=	177	TAN2=	0.5166 0.8562	0.0000
LINE CONNECTS KEYPOINTS			177	176		
LINE NO.=	201	KP1=	177	TAN1=	-0.5070 -0.8619	0.0000
		KP2=	176	TAN2=	0.5070 0.8619	0.0000
LINE CONNECTS KEYPOINTS			185	184		
LINE NO.=	202	KP1=	185	TAN1=	-0.5166 -0.8562	0.0000
		KP2=	184	TAN2=	0.5166 0.8562	0.0000
LINE CONNECTS KEYPOINTS			184	183		
LINE NO.=	203	KP1=	184	TAN1=	-0.5070 -0.8619	0.0000
		KP2=	183	TAN2=	0.5070 0.8619	0.0000
LINE CONNECTS KEYPOINTS			168	167		
LINE NO.=	204	KP1=	168	TAN1=	-0.1726 -0.9850	0.0000
		KP2=	167	TAN2=	0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			175	174		
LINE NO.=	205	KP1=	175	TAN1=	-0.1726 -0.9850	0.0000
		KP2=	174	TAN2=	0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			182	181		
LINE NO.=	206	KP1=	182	TAN1=	-0.1726 -0.9850	0.0000
		KP2=	181	TAN2=	0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			47	48		
LINE NO.=	207	KP1=	47	TAN1=	0.1726 -0.9850	0.0000
		KP2=	48	TAN2=	-0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			54	55		
LINE NO.=	208	KP1=	54	TAN1=	0.1726 -0.9850	0.0000
		KP2=	55	TAN2=	-0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			61	62		
LINE NO.=	209	KP1=	61	TAN1=	0.1726 -0.9850	0.0000
		KP2=	62	TAN2=	-0.1726 0.9850	0.0000
LINE CONNECTS KEYPOINTS			49	50		
LINE NO.=	210	KP1=	49	TAN1=	0.5070 -0.8619	0.0000
		KP2=	50	TAN2=	-0.5070 0.8619	0.0000
LINE CONNECTS KEYPOINTS			50	51		
LINE NO.=	211	KP1=	50	TAN1=	0.5166 -0.8562	0.0000
		KP2=	51	TAN2=	-0.5166 0.8562	0.0000
LINE CONNECTS KEYPOINTS			56	57		
LINE NO.=	212	KP1=	56	TAN1=	0.5070 -0.8619	0.0000
		KP2=	57	TAN2=	-0.5070 0.8619	0.0000

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LINE CONNECTS KEYPOINTS     57    58
 LINE NO.=   213  KP1=      57  TAN1=    0.5166  -0.8562   0.0000
                  KP2=      58  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS     63    64
 LINE NO.=   214  KP1=      63  TAN1=    0.5070  -0.8619   0.0000
                  KP2=      64  TAN2=   -0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS     64    65
 LINE NO.=   215  KP1=      64  TAN1=    0.5166  -0.8562   0.0000
                  KP2=      65  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    117   116
 LINE NO.=   216  KP1=     117  TAN1=    0.8562  -0.5166   0.0000
                  KP2=     116  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    116   115
 LINE NO.=   217  KP1=     116  TAN1=    0.8619  -0.5070   0.0000
                  KP2=     115  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    124   123
 LINE NO.=   218  KP1=     124  TAN1=    0.8562  -0.5166   0.0000
                  KP2=     123  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    123   122
 LINE NO.=   219  KP1=     123  TAN1=    0.8619  -0.5070   0.0000
                  KP2=     122  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    131   130
 LINE NO.=   220  KP1=     131  TAN1=    0.8562  -0.5166   0.0000
                  KP2=     130  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    130   129
 LINE NO.=   221  KP1=     130  TAN1=    0.8619  -0.5070   0.0000
                  KP2=     129  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    114   113
 LINE NO.=   222  KP1=     114  TAN1=    0.9850  -0.1726   0.0000
                  KP2=     113  TAN2=   -0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    121   120
 LINE NO.=   223  KP1=     121  TAN1=    0.9850  -0.1726   0.0000
                  KP2=     120  TAN2=   -0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    128   127
 LINE NO.=   224  KP1=     128  TAN1=    0.9850  -0.1726   0.0000
                  KP2=     127  TAN2=   -0.9850   0.1726   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
    TO  NDIV =    2,  SPACING RATIO =   1.000
 line set 7 tube thickness

LINE CONNECTS KEYPOINTS    196   195
 LINE NO.=   225  KP1=     196  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     195  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   201
 LINE NO.=   226  KP1=     205  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     201  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    204   200
 LINE NO.=   227  KP1=     204  TAN1=    0.7071   0.7071   0.0000
                  KP2=     200  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    193   194
 LINE NO.=   228  KP1=     193  TAN1=    0.0000   1.0000   0.0000
                  KP2=     194  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   215
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LINE NO.=	229	KP1=	210	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	215	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			220	217			
LINE NO.=	230	KP1=	220	TAN1=	0.7071	-0.7071	0.0000
		KP2=	217	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			219	216			
LINE NO.=	231	KP1=	219	TAN1=	0.7071	0.7071	0.0000
		KP2=	216	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			209	214			
LINE NO.=	232	KP1=	209	TAN1=	-0.7071	0.7071	0.0000
		KP2=	214	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			192	191			
LINE NO.=	233	KP1=	192	TAN1=	0.0000	-1.0000	0.0000
		KP2=	191	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			203	199			
LINE NO.=	234	KP1=	203	TAN1=	0.7071	-0.7071	0.0000
		KP2=	199	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			202	198			
LINE NO.=	235	KP1=	202	TAN1=	0.7071	0.7071	0.0000
		KP2=	198	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			189	190			
LINE NO.=	236	KP1=	189	TAN1=	0.0000	1.0000	0.0000
		KP2=	190	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			208	213			
LINE NO.=	237	KP1=	208	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	213	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			159	155			
LINE NO.=	238	KP1=	159	TAN1=	0.7071	-0.7071	0.0000
		KP2=	155	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			146	152			
LINE NO.=	239	KP1=	146	TAN1=	0.7071	0.7071	0.0000
		KP2=	152	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			145	151			
LINE NO.=	240	KP1=	145	TAN1=	-0.7071	0.7071	0.0000
		KP2=	151	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			160	156			
LINE NO.=	241	KP1=	160	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	156	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			161	157			
LINE NO.=	242	KP1=	161	TAN1=	0.7071	-0.7071	0.0000
		KP2=	157	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			148	154			
LINE NO.=	243	KP1=	148	TAN1=	0.7071	0.7071	0.0000
		KP2=	154	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			147	153			
LINE NO.=	244	KP1=	147	TAN1=	-0.7071	0.7071	0.0000
		KP2=	153	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			188	187			
LINE NO.=	245	KP1=	188	TAN1=	0.0000	-1.0000	0.0000
		KP2=	187	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			138	133			
LINE NO.=	246	KP1=	138	TAN1=	0.7071	-0.7071	0.0000
		KP2=	133	TAN2=	-0.7071	0.7071	0.0000

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 LINE CONNECTS KEYPOINTS      18     13
  LINE NO.=    247  KP1=      18  TAN1=    0.7071    0.7071    0.0000
                    KP2=      13  TAN2=   -0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      69     68
  LINE NO.=    248  KP1=      69  TAN1=    0.0000    1.0000    0.0000
                    KP2=      68  TAN2=    0.0000   -1.0000    0.0000

 LINE CONNECTS KEYPOINTS     139    134
  LINE NO.=    249  KP1=     139  TAN1=   -0.7071   -0.7071    0.0000
                    KP2=     134  TAN2=    0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS     140    135
  LINE NO.=    250  KP1=     140  TAN1=    0.7071   -0.7071    0.0000
                    KP2=     135  TAN2=   -0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS      20     15
  LINE NO.=    251  KP1=      20  TAN1=    0.7071    0.7071    0.0000
                    KP2=      15  TAN2=   -0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      19     14
  LINE NO.=    252  KP1=      19  TAN1=   -0.7071    0.7071    0.0000
                    KP2=      14  TAN2=    0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS     141    136
  LINE NO.=    253  KP1=     141  TAN1=   -0.7071   -0.7071    0.0000
                    KP2=     136  TAN2=    0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS     142    137
  LINE NO.=    254  KP1=     142  TAN1=    0.7071   -0.7071    0.0000
                    KP2=     137  TAN2=   -0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS      22     17
  LINE NO.=    255  KP1=      22  TAN1=    0.7071    0.7071    0.0000
                    KP2=      17  TAN2=   -0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      21     16
  LINE NO.=    256  KP1=      21  TAN1=   -0.7071    0.7071    0.0000
                    KP2=      16  TAN2=    0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      70     71
  LINE NO.=    257  KP1=      70  TAN1=    0.0000   -1.0000    0.0000
                    KP2=      71  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS      85     80
  LINE NO.=    258  KP1=      85  TAN1=    0.7071   -0.7071    0.0000
                    KP2=      80  TAN2=   -0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS      86     81
  LINE NO.=    259  KP1=      86  TAN1=    0.7071    0.7071    0.0000
                    KP2=      81  TAN2=   -0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      73     72
  LINE NO.=    260  KP1=      73  TAN1=    0.0000    1.0000    0.0000
                    KP2=      72  TAN2=    0.0000   -1.0000    0.0000

 LINE CONNECTS KEYPOINTS      25     31
  LINE NO.=    261  KP1=      25  TAN1=   -0.7071   -0.7071    0.0000
                    KP2=      31  TAN2=    0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS      26     32
  LINE NO.=    262  KP1=      26  TAN1=    0.7071   -0.7071    0.0000
                    KP2=      32  TAN2=   -0.7071    0.7071    0.0000

 LINE CONNECTS KEYPOINTS      39     35
  LINE NO.=    263  KP1=      39  TAN1=    0.7071    0.7071    0.0000
                    KP2=      35  TAN2=   -0.7071   -0.7071    0.0000

 LINE CONNECTS KEYPOINTS      92     98
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 LINE NO.=   264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     98  TAN2=    0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=     27  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     33  TAN2=    0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=     28  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     34  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=     41  TAN1=    0.7071   0.7071   0.0000
                  KP2=     37  TAN2=   -0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=     40  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     36  TAN2=    0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=     74  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     75  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=     87  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     82  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=     88  TAN1=    0.7071   0.7071   0.0000
                  KP2=     83  TAN2=   -0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=     77  TAN1=    0.0000   1.0000   0.0000
                  KP2=     76  TAN2=    0.0000  -1.0000   0.0000

 LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=     93  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     99  TAN2=    0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=    106  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    102  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=    107  TAN1=    0.7071   0.7071   0.0000
                  KP2=    103  TAN2=   -0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=     94  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    100  TAN2=    0.7071  -0.7071   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     1,  SPACING RATIO =    1.000

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
  line set 8, arc 1 bottom

 LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=    222  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    207  TAN2=    0.9856   0.1691   0.0000

 LINE CONNECTS KEYPOINTS    223   224
 LINE NO.=   278  KP1=    223  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    224  TAN2=    0.9856   0.1691   0.0000

 LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279  KP1=    229  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    230  TAN2=    0.9856   0.1691   0.0000

 LINE CONNECTS KEYPOINTS    235   236
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 LINE NO.=   280  KP1=    235  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    236  TAN2=    0.9856   0.1691   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281  KP1=    212  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    218  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282  KP1=    225  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    226  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283  KP1=    231  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    232  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284  KP1=    237  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    238  TAN2=    0.8655   0.5009   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285  KP1=    221  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    163  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286  KP1=    228  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    171  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287  KP1=    234  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    178  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288  KP1=    240  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    185  TAN2=    0.5201   0.8541   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289  KP1=    158  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    150  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290  KP1=    169  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    168  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291  KP1=    176  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    175  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292  KP1=    183  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    182  TAN2=    0.1762   0.9844   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     24  TAN2=   -0.1691   0.9856   0.0000
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LINE CONNECTS KEYPOINTS    167    47
 LINE NO.=   294  KP1=     167  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=      47  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=     174  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=      54  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=     181  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=      61  TAN2=   -0.1691   0.9856   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=      30  TAN1=    0.1762  -0.9844   0.0000
                  KP2=      38  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=      48  TAN1=    0.1762  -0.9844   0.0000
                  KP2=      49  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=      55  TAN1=    0.1762  -0.9844   0.0000
                  KP2=      56  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=      62  TAN1=    0.1762  -0.9844   0.0000
                  KP2=      63  TAN2=   -0.5009   0.8655   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=      43  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     109  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=      51  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     117  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=      58  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     124  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=      65  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     131  TAN2=   -0.8541   0.5201   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=     104  TAN1=    0.8655  -0.5009   0.0000
                  KP2=      96  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    115   114
 LINE NO.=   306  KP1=     115  TAN1=    0.8655  -0.5009   0.0000
                  KP2=     114  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307  KP1=     122  TAN1=    0.8655  -0.5009   0.0000
                  KP2=     121  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    129   128
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 LINE NO.=   308  KP1=    129  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    128  TAN2=   -0.9844   0.1762   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=     90  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=    113  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=    120  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=    127  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=    222  TAN1=    0.0000   1.0000   0.0000
                  KP2=    223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=    207  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    224  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=    212  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    225  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=    218  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    226  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=    220  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    227  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=    221  TAN1=   -0.5201   0.8541   0.0000
                  KP2=    228  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=    163  TAN1=   -0.8541   0.5201   0.0000
                  KP2=    171  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=    161  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    170  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    158   169
 LINE NO.=   321  KP1=    158  TAN1=   -0.8655   0.5009   0.0000
                  KP2=    169  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=    150  TAN1=   -0.9844   0.1762   0.0000
                  KP2=    168  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    144   167
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 LINE NO.=   323  KP1=    144  TAN1=   -0.9856   0.1691   0.0000
                  KP2=    167  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=     24  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=     47  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=     30  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=     48  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=     38  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     49  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=     41  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     50  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=     43  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=     51  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=    109  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=    117  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=    107  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=    116  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=    104  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    115  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=     96  TAN1=   -0.1762  -0.9844   0.0000
                  KP2=    114  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=     90  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=    113  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=    110  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    112  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =   1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=    223  TAN1=    0.0000   1.0000   0.0000
                  KP2=    229  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=    224  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    230  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=    225  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    231  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=   338  KP1=    226  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    232  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=   339  KP1=    227  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    233  TAN2=    0.5130  -0.8584   0.0000
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LINE CONNECTS KEYPOINTS    228   234
 LINE NO.=   340  KP1=     228  TAN1=   -0.5201   0.8541   0.0000
                  KP2=     234  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    171   178
 LINE NO.=   341  KP1=     171  TAN1=   -0.8541   0.5201   0.0000
                  KP2=     178  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    170   177
 LINE NO.=   342  KP1=     170  TAN1=   -0.8584   0.5130   0.0000
                  KP2=     177  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    169   176
 LINE NO.=   343  KP1=     169  TAN1=   -0.8655   0.5009   0.0000
                  KP2=     176  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    168   175
 LINE NO.=   344  KP1=     168  TAN1=   -0.9844   0.1762   0.0000
                  KP2=     175  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    167   174
 LINE NO.=   345  KP1=     167  TAN1=   -0.9856   0.1691   0.0000
                  KP2=     174  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     47    54
 LINE NO.=   346  KP1=      47  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=      54  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     48    55
 LINE NO.=   347  KP1=      48  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=      55  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     49    56
 LINE NO.=   348  KP1=      49  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=      56  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     50    57
 LINE NO.=   349  KP1=      50  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=      57  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     51    58
 LINE NO.=   350  KP1=      51  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=      58  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    117   124
 LINE NO.=   351  KP1=     117  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=     124  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    116   123
 LINE NO.=   352  KP1=     116  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=     123  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    115   122
 LINE NO.=   353  KP1=     115  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=     122  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    114   121
 LINE NO.=   354  KP1=     114  TAN1=   -0.1762  -0.9844   0.0000
                  KP2=     121  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    113   120
 LINE NO.=   355  KP1=     113  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     120  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    112   119
 LINE NO.=   356  KP1=     112  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     119  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
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TO NDIV = 2, SPACING RATIO = 1.000
line set 19 skirt thickness

LINE CONNECTS KEYPOINTS		229	235			
LINE NO.=	357	KP1=	229	TAN1=	0.0000	1.0000	0.0000
		KP2=	235	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS		230	236			
LINE NO.=	358	KP1=	230	TAN1=	-0.1691	0.9856	0.0000
		KP2=	236	TAN2=	0.1691	-0.9856	0.0000
LINE CONNECTS KEYPOINTS		231	237			
LINE NO.=	359	KP1=	231	TAN1=	-0.1762	0.9844	0.0000
		KP2=	237	TAN2=	0.1762	-0.9844	0.0000
LINE CONNECTS KEYPOINTS		232	238			
LINE NO.=	360	KP1=	232	TAN1=	-0.5009	0.8655	0.0000
		KP2=	238	TAN2=	0.5009	-0.8655	0.0000
LINE CONNECTS KEYPOINTS		233	239			
LINE NO.=	361	KP1=	233	TAN1=	-0.5130	0.8584	0.0000
		KP2=	239	TAN2=	0.5130	-0.8584	0.0000
LINE CONNECTS KEYPOINTS		234	240			
LINE NO.=	362	KP1=	234	TAN1=	-0.5201	0.8541	0.0000
		KP2=	240	TAN2=	0.5201	-0.8541	0.0000
LINE CONNECTS KEYPOINTS		178	185			
LINE NO.=	363	KP1=	178	TAN1=	-0.8541	0.5201	0.0000
		KP2=	185	TAN2=	0.8541	-0.5201	0.0000
LINE CONNECTS KEYPOINTS		177	184			
LINE NO.=	364	KP1=	177	TAN1=	-0.8584	0.5130	0.0000
		KP2=	184	TAN2=	0.8584	-0.5130	0.0000
LINE CONNECTS KEYPOINTS		176	183			
LINE NO.=	365	KP1=	176	TAN1=	-0.8655	0.5009	0.0000
		KP2=	183	TAN2=	0.8655	-0.5009	0.0000
LINE CONNECTS KEYPOINTS		175	182			
LINE NO.=	366	KP1=	175	TAN1=	-0.9844	0.1762	0.0000
		KP2=	182	TAN2=	0.9844	-0.1762	0.0000
LINE CONNECTS KEYPOINTS		174	181			
LINE NO.=	367	KP1=	174	TAN1=	-0.9856	0.1691	0.0000
		KP2=	181	TAN2=	0.9856	-0.1691	0.0000
LINE CONNECTS KEYPOINTS		54	61			
LINE NO.=	368	KP1=	54	TAN1=	-0.9856	-0.1691	0.0000
		KP2=	61	TAN2=	0.9856	0.1691	0.0000
LINE CONNECTS KEYPOINTS		55	62			
LINE NO.=	369	KP1=	55	TAN1=	-0.9844	-0.1762	0.0000
		KP2=	62	TAN2=	0.9844	0.1762	0.0000
LINE CONNECTS KEYPOINTS		56	63			
LINE NO.=	370	KP1=	56	TAN1=	-0.8655	-0.5009	0.0000
		KP2=	63	TAN2=	0.8655	0.5009	0.0000
LINE CONNECTS KEYPOINTS		57	64			
LINE NO.=	371	KP1=	57	TAN1=	-0.8584	-0.5130	0.0000
		KP2=	64	TAN2=	0.8584	0.5130	0.0000
LINE CONNECTS KEYPOINTS		58	65			
LINE NO.=	372	KP1=	58	TAN1=	-0.8541	-0.5201	0.0000
		KP2=	65	TAN2=	0.8541	0.5201	0.0000
LINE CONNECTS KEYPOINTS		124	131			
LINE NO.=	373	KP1=	124	TAN1=	-0.5201	-0.8541	0.0000
		KP2=	131	TAN2=	0.5201	0.8541	0.0000

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 LINE CONNECTS KEYPOINTS    123   130
  LINE NO.=   374  KP1=     123  TAN1=   -0.5130  -0.8584   0.0000
                   KP2=     130  TAN2=    0.5130   0.8584   0.0000

 LINE CONNECTS KEYPOINTS    122   129
  LINE NO.=   375  KP1=     122  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=     129  TAN2=    0.5009   0.8655   0.0000

 LINE CONNECTS KEYPOINTS    121   128
  LINE NO.=   376  KP1=     121  TAN1=   -0.1762  -0.9844   0.0000
                   KP2=     128  TAN2=    0.1762   0.9844   0.0000

 LINE CONNECTS KEYPOINTS    120   127
  LINE NO.=   377  KP1=     120  TAN1=   -0.1691  -0.9856   0.0000
                   KP2=     127  TAN2=    0.1691   0.9856   0.0000

 LINE CONNECTS KEYPOINTS    119   126
  LINE NO.=   378  KP1=     119  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     126  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000
  lines to fill in lids
  lines tube height

 LINE CONNECTS KEYPOINTS    195   194
  LINE NO.=   379  KP1=     195  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     194  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    191   190
  LINE NO.=   380  KP1=     191  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     190  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    187    68
  LINE NO.=   381  KP1=     187  TAN1=    0.0000  -1.0000   0.0000
                   KP2=      68  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     71    72
  LINE NO.=   382  KP1=      71  TAN1=    0.0000  -1.0000   0.0000
                   KP2=      72  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     75    76
  LINE NO.=   383  KP1=      75  TAN1=    0.0000  -1.0000   0.0000
                   KP2=      76  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000
  end lines

 LINE CONNECTS KEYPOINTS    222   197
  LINE NO.=   384  KP1=     222  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     197  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     78   110
  LINE NO.=   385  KP1=      78  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     110  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000
  area set 1, tubes

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     195   196   205   201

     AREA NUMBER =       1

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     200   201   205   204
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     AREA NUMBER =      2

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    193   194   200   204

     AREA NUMBER =      3

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    191   192   203   199

     AREA NUMBER =      4

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    198   199   203   202

     AREA NUMBER =      5

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    189   190   198   202

     AREA NUMBER =      6

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    187   188   138   133

     AREA NUMBER =      7

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    133   138    18    13

     AREA NUMBER =      8

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     69    68    13    18

     AREA NUMBER =      9

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     71    70    85    80

     AREA NUMBER =     10

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     80    85    86    81

     AREA NUMBER =     11

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     73    72    81    86

     AREA NUMBER =     12

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     75    74    87    82

     AREA NUMBER =     13

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     82    87    88    83

     AREA NUMBER =     14

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     77    76    83    88

     AREA NUMBER =     15

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    209   210   215   214
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    AREA NUMBER =      16

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    215   210   220   217

    AREA NUMBER =      17

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    216   217   220   219

    AREA NUMBER =      18

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   214   216   219

    AREA NUMBER =      19

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   208   213   151

    AREA NUMBER =      20

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    213   208   159   155

    AREA NUMBER =      21

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    152   155   159   146

    AREA NUMBER =      22

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   151   152   146

    AREA NUMBER =      23

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    134   139   140   135

    AREA NUMBER =      24

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    135   140    20    15

    AREA NUMBER =      25

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19    14    15    20

    AREA NUMBER =      26

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19   139   134    14

    AREA NUMBER =      27

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    25    31    98

    AREA NUMBER =      28

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31    25    26    32

    AREA NUMBER =      29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32    26    39    35
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    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    98    35    39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    93    99   100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99    93   106   102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102   106   107   103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94   100   103   107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156   160   161   157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157   161   148   154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   153   154   148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   160   156   153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136   141   142   137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137   142    22    17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    16    17    22

    AREA NUMBER =     42

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34
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    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    202   203   208   145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146   159   160   147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188   189   202   138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138   202   145   139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139   145   146   140

    AREA NUMBER =     56

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142
```

```
     AREA NUMBER =     58

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     18   138   139    19

     AREA NUMBER =     59

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     20   140   141    21

     AREA NUMBER =     60

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     70    69    18    85

     AREA NUMBER =     61

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     85    18    19    25

     AREA NUMBER =     62

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     25    19    20    26

     AREA NUMBER =     63

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     26    20    21    27

     AREA NUMBER =     64

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     27    21    22    28

     AREA NUMBER =     65

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     86    85    25    92

     AREA NUMBER =     66

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     39    26    27    40

     AREA NUMBER =     67

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     74    73    86    87

     AREA NUMBER =     68

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     87    86    92    93

     AREA NUMBER =     69

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     93    92    39   106

     AREA NUMBER =     70

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     88    87    93    94

     AREA NUMBER =     71
 area set 3, end guides

 DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    196   197   206   205

    AREA NUMBER =     72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205   206   211   210

    AREA NUMBER =     73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206   207   212   211

    AREA NUMBER =     74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210   211   218   220

    AREA NUMBER =     75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148   161   158   149

    AREA NUMBER =     76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142   148   149   143

    AREA NUMBER =     77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143   149   150   144

    AREA NUMBER =     78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22   142   143    23

    AREA NUMBER =     79

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     28    22    23    29

    AREA NUMBER =     80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     29    23    24    30

    AREA NUMBER =     81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    28    29    38

    AREA NUMBER =     82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     95    94   107   104

    AREA NUMBER =     83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     89    88    94    95

    AREA NUMBER =     84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    89    95    96

    AREA NUMBER =     85

DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    78    77    88    89

    AREA NUMBER =     86
 area set 4, corner guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   219   220   221   162

    AREA NUMBER =     87

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   159   219   162   160

    AREA NUMBER =     88

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   160   162   163   161

    AREA NUMBER =     89

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   107   106    42   109

    AREA NUMBER =     90

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   106    39    40    42

    AREA NUMBER =     91

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    42    40    41    43

    AREA NUMBER =     92

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 area set 5, inner barrier

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   222   223   224   207

    AREA NUMBER =     93

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   207   224   225   212

    AREA NUMBER =     94

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   212   225   226   218

    AREA NUMBER =     95

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   218   226   227   220

    AREA NUMBER =     96

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   220   227   228   221

    AREA NUMBER =     97

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   163   171   170   161
```

```
    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104   115   114    96

    AREA NUMBER =    111

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90   113   112   110
```

```
    AREA NUMBER =    113
 area set 6, outer barrier

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         1,

*** WARNING ***                          CP=      5.120   TIME= 15:52:54
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.130   TIME= 15:52:54
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.140   TIME= 15:52:54
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.150   TIME= 15:52:54
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.150   TIME= 15:52:54
Area 20 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.150   TIME= 15:52:54
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.160   TIME= 15:52:54
Area 41 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.170   TIME= 15:52:54
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.170   TIME= 15:52:54
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.170   TIME= 15:52:54
```

```
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.170   TIME= 15:52:54
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.180   TIME= 15:52:54
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.190   TIME= 15:52:54
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.190   TIME= 15:52:54
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.190   TIME= 15:52:54
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 67 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.200   TIME= 15:52:54
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.210   TIME= 15:52:54
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 90 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.220   TIME= 15:52:54
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.230   TIME= 15:52:54
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.240   TIME= 15:52:54
Area 113 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2875     AND   2.2875
```

```
  KABS=  0.  TOLERANCE= 0.114375E-01

  113  AREAS (OF   509  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT      FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    21  AREAS (OF    509  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 441 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 444 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 448 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 451 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 454 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 458 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 461 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 464 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 468 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.250   TIME= 15:53:07
Area 471 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 475 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 478 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 482 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 485 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 488 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 492 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 495 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     12.260   TIME= 15:53:07
Area 498 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     12.260   TIME= 15:53:07
Area 502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.260   TIME= 15:53:07
Area 505 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.260   TIME= 15:53:07
Area 509 is not meshed.  Volume will be generated without elements.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2775     AND   2.2775
  KABS=  0.  TOLERANCE= 0.113875E-01

  113  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    373 USED FOR KEYPOINT(S)     521
KEYPOINT    375 USED FOR KEYPOINT(S)     522
KEYPOINT    377 USED FOR KEYPOINT(S)     523
KEYPOINT    379 USED FOR KEYPOINT(S)     458
KEYPOINT    381 USED FOR KEYPOINT(S)     540
KEYPOINT    383 USED FOR KEYPOINT(S)     542
KEYPOINT    385 USED FOR KEYPOINT(S)     496
KEYPOINT    387 USED FOR KEYPOINT(S)     524
KEYPOINT    389 USED FOR KEYPOINT(S)     527
KEYPOINT    391 USED FOR KEYPOINT(S)     528
KEYPOINT    393 USED FOR KEYPOINT(S)     531
KEYPOINT    395 USED FOR KEYPOINT(S)     532
KEYPOINT    397 USED FOR KEYPOINT(S)     533
KEYPOINT    399 USED FOR KEYPOINT(S)     514
KEYPOINT    401 USED FOR KEYPOINT(S)     545
KEYPOINT    403 USED FOR KEYPOINT(S)     544
KEYPOINT    405 USED FOR KEYPOINT(S)     492
KEYPOINT    407 USED FOR KEYPOINT(S)     535
KEYPOINT    409 USED FOR KEYPOINT(S)     538
KEYPOINT    410 USED FOR KEYPOINT(S)     537
LINE    837 USED FOR LINE(S)   1121
LINE    847 USED FOR LINE(S)   1124
LINE    852 USED FOR LINE(S)   1152
LINE    862 USED FOR LINE(S)   1157
LINE    867 USED FOR LINE(S)   1125
LINE    877 USED FOR LINE(S)   1131
LINE    887 USED FOR LINE(S)   1138
LINE    897 USED FOR LINE(S)   1141
LINE    902 USED FOR LINE(S)   1162
LINE    912 USED FOR LINE(S)   1160
LINE    917 USED FOR LINE(S)   1143
LINE    923 USED FOR LINE(S)   1149
 generate lines to fill in lid at top of WP
 lines tube height

LINE CONNECTS KEYPOINTS    414   421
 LINE NO.=  1121  KP1=    414  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    421  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    422   429
```

```
 LINE NO.=  1124  KP1=    422  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    429  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    430   437
 LINE NO.=  1125  KP1=    430  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    437  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    438   445
 LINE NO.=  1131  KP1=    438  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    445  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    446   453
 LINE NO.=  1138  KP1=    446  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    453  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    370   518
 LINE NO.=  1141  KP1=    370  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    518  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    539   413
 LINE NO.=  1143  KP1=    539  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    413  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =   832 1116 1120 1141
     (TRAVERSED IN SAME DIRECTION AS LINE   832)

    AREA NUMBER =    687

DEFINE AREA BY LIST OF LINES
     LINE LIST =   936  937  941 1121
     (TRAVERSED IN SAME DIRECTION AS LINE   936)

    AREA NUMBER =    688

DEFINE AREA BY LIST OF LINES
     LINE LIST =   946  947  951 1124
     (TRAVERSED IN SAME DIRECTION AS LINE   946)

    AREA NUMBER =    689

DEFINE AREA BY LIST OF LINES
     LINE LIST =   956  959  961 1125
     (TRAVERSED IN SAME DIRECTION AS LINE   956)

    AREA NUMBER =    690

DEFINE AREA BY LIST OF LINES
     LINE LIST =   966  969  971 1131
     (TRAVERSED IN SAME DIRECTION AS LINE   966)

    AREA NUMBER =    691

DEFINE AREA BY LIST OF LINES
     LINE LIST =   976  979  981 1138
     (TRAVERSED IN SAME DIRECTION AS LINE   976)

    AREA NUMBER =    692

DEFINE AREA BY LIST OF LINES
     LINE LIST =   932 1143 1147 1151
     (TRAVERSED IN SAME DIRECTION AS LINE   932)
```

```
    AREA NUMBER =    693

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   842 1122 1123
      (TRAVERSED IN SAME DIRECTION AS LINE   842)

    AREA NUMBER =    694

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   985  989  990  993
      (TRAVERSED IN SAME DIRECTION AS LINE   985)

    AREA NUMBER =    695

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   997 1001 1002 1005
      (TRAVERSED IN SAME DIRECTION AS LINE   997)

    AREA NUMBER =    696

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1010 1013 1015 1018
      (TRAVERSED IN SAME DIRECTION AS LINE  1010)

    AREA NUMBER =    697

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1021 1025 1028 1029
      (TRAVERSED IN SAME DIRECTION AS LINE  1021)

    AREA NUMBER =    698

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1033 1037 1040 1041
      (TRAVERSED IN SAME DIRECTION AS LINE  1033)

    AREA NUMBER =    699

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   922 1144 1148
      (TRAVERSED IN SAME DIRECTION AS LINE   922)

    AREA NUMBER =    700

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   857 1153 1156
      (TRAVERSED IN SAME DIRECTION AS LINE   857)

    AREA NUMBER =    701

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1046 1049 1051 1054
      (TRAVERSED IN SAME DIRECTION AS LINE  1046)

    AREA NUMBER =    702

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1058 1061 1063 1066
      (TRAVERSED IN SAME DIRECTION AS LINE  1058)

    AREA NUMBER =    703

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1070 1073 1075 1078
      (TRAVERSED IN SAME DIRECTION AS LINE  1070)

    AREA NUMBER =    704

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   907 1159 1163
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE   907)

    AREA NUMBER =    705

DEFINE AREA BY LIST OF LINES
     LINE LIST =   872 1126 1130
     (TRAVERSED IN SAME DIRECTION AS LINE   872)

    AREA NUMBER =    706

DEFINE AREA BY LIST OF LINES
     LINE LIST =   882 1132 1133 1137
     (TRAVERSED IN SAME DIRECTION AS LINE   882)

    AREA NUMBER =    707

DEFINE AREA BY LIST OF LINES
     LINE LIST =   892 1139 1140
     (TRAVERSED IN SAME DIRECTION AS LINE   892)

    AREA NUMBER =    708

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.3075     AND   2.3075
  KABS=  0.  TOLERANCE= 0.115375E-01

  135  AREAS (OF   708  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         3,

*** WARNING ***                          CP=     16.330   TIME= 15:53:14
Area 514 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 15:53:14
Area 518 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 522 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 526 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 530 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 542 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 546 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 550 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 554 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 562 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     16.340   TIME= 15:53:14
Area 566 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 578 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 586 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 590 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 595 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.350   TIME= 15:53:14
Area 598 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 599 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 601 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 602 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 605 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 607 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 608 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
Area 609 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.360   TIME= 15:53:14
```

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Area 610 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.360   TIME= 15:53:14
Area 611 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 613 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 614 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 615 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 616 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 617 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 618 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 619 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 620 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 621 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.370   TIME= 15:53:14
Area 622 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 623 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 624 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 625 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 626 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 627 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 629 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 630 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      16.380   TIME= 15:53:14
Area 633 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 635 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 638 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 639 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 641 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 642 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.390   TIME= 15:53:14
Area 644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 645 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 647 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 650 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 653 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.400   TIME= 15:53:14
Area 656 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 659 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 662 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 665 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.410   TIME= 15:53:15
Area 666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 668 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 671 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 674 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 677 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 678 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
Area 679 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.420   TIME= 15:53:15
```

```
Area 680 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.420   TIME= 15:53:15
Area 681 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 682 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 683 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 684 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 685 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 686 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 687 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 688 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 689 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 690 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 691 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 692 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 694 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 695 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.430   TIME= 15:53:15
Area 697 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 698 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 699 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 700 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 701 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.440   TIME= 15:53:15
Area 703 is not meshed.  Volume will be generated without elements.
```

```
 *** WARNING ***                                 CP=      16.440   TIME= 15:53:15
 Area 704 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                 CP=      16.440   TIME= 15:53:15
 Area 705 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                 CP=      16.450   TIME= 15:53:15
 Area 706 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                 CP=      16.450   TIME= 15:53:15
 Area 707 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                 CP=      16.450   TIME= 15:53:15
 Area 708 is not meshed.  Volume will be generated without elements.
  lines at bottom lid used to be here

  Mesh Volumes

  Mesh the CS Tubes

  Mesh SS-B Plates

 SELECT        FOR ITEM=VOLU COMPONENT=
  IN RANGE       48 TO         71 STEP         1

    24  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ELEMENT TYPE SET TO       2

 MATERIAL NUMBER SET TO      2

 GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

 *** WARNING ***                                 CP=      26.030   TIME= 15:53:35
 Meshing of volume 50 produced 36 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
           241     242     243     244     245     246     247     248
           249     250     251     252     253     254     255     256
           257     258     271     272     273     274     275     276
           277     278     279     280     281     282     283     284
           285     286     287     288

 *** WARNING ***                                 CP=      27.710   TIME= 15:53:38
 Meshing of volume 55 produced 36 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    55 WITH EXCESSIVE ASPECT RATIO ***
           781     782     783     784     785     786     787     788
           789     790     791     792     793     794     795     796
           797     798     811     812     813     814     815     816
           817     818     819     820     821     822     823     824
           825     826     827     828

 *** WARNING ***                                 CP=      28.260   TIME= 15:53:39
 Meshing of volume 57 produced 36 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    57 WITH EXCESSIVE ASPECT RATIO ***
           961     962     963     964     965     966     967     968
           969     970     971     972     973     974     975     976
           977     978     991     992     993     994     995     996
           997     998     999    1000    1001    1002    1003    1004
          1005    1006    1007    1008
```

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*** WARNING ***                          CP=     29.960   TIME= 15:53:42
Meshing of volume 62 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    62 WITH EXCESSIVE ASPECT RATIO ***
         1501    1502    1503    1504    1505    1506    1507    1508
         1509    1510    1511    1512    1513    1514    1515    1516
         1517    1518    1531    1532    1533    1534    1535    1536
         1537    1538    1539    1540    1541    1542    1543    1544
         1545    1546    1547    1548


*** WARNING ***                          CP=     30.580   TIME= 15:53:43
Meshing of volume 64 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    64 WITH EXCESSIVE ASPECT RATIO ***
         1681    1682    1683    1684    1685    1686    1687    1688
         1689    1690    1691    1692    1693    1694    1695    1696
         1697    1698    1711    1712    1713    1714    1715    1716
         1717    1718    1719    1720    1721    1722    1723    1724
         1725    1726    1727    1728


*** WARNING ***                          CP=     32.210   TIME= 15:53:46
Meshing of volume 69 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
         2221    2222    2223    2224    2225    2226    2227    2228
         2229    2230    2231    2232    2233    2234    2235    2236
         2237    2238    2251    2252    2253    2254    2255    2256
         2257    2258    2259    2260    2261    2262    2263    2264
         2265    2266    2267    2268


NUMBER OF VOLUMES MESHED    =     24
MAXIMUM NODE NUMBER         =   4000
MAXIMUM ELEMENT NUMBER      =   2520
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP        1

   15  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     33.580   TIME= 15:53:48
Meshing of volume 72 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    72 WITH EXCESSIVE ASPECT RATIO ***
         2521    2536    2551    2566    2581    2596    2611    2626


*** WARNING ***                          CP=     33.820   TIME= 15:53:48
Meshing of volume 73 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    73 WITH EXCESSIVE ASPECT RATIO ***
         2641    2642    2643    2644    2645    2646    2647    2648
         2649    2650    2651    2652    2653    2654    2655    2656
         2657    2658    2659    2660    2661    2662    2663    2671
         2672    2673    2674    2675    2676    2677    2678    2679
         2680    2681    2682    2683    2684    2685    2686    2687
```

2688 2689 2690 2691 2692 2693

*** WARNING *** CP= 34.170 TIME= 15:53:49
Meshing of volume 74 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 74 WITH EXCESSIVE ASPECT RATIO ***

2701	2702	2703	2716	2717	2718	2731	2732
2733	2746	2747	2748	2761	2762	2763	2776
2777	2778	2791	2792	2793	2806	2807	2808

*** WARNING *** CP= 34.290 TIME= 15:53:49
Volume 75 area 75 has a corner angle of 150 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.300 TIME= 15:53:49
Volume 75 area 380 has a corner angle of 150 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.520 TIME= 15:53:50
Meshing of volume 75 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 75 WITH EXCESSIVE DISTORTION ***

2881	2882	2883	2884	2885	2886	2887	2888
2889	2890	2891	2892	2893	2894	2895	2896
2897	2898	2899	2900	2901	2902	2903	2904
2905	2906	2907	2908	2909	2910	2911	2912
2913	2914	2915	2916	2917	2918	2919	2920
2921	2922	2923	2924	2925	2926	2927	2928
2929	2930	2931	2932	2933	2934	2935	2936
2937	2938	2939	2940				

*** WARNING *** CP= 34.650 TIME= 15:53:50
Volume 76 area 76 has a corner angle of 30 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.670 TIME= 15:53:50
Volume 76 area 384 has a corner angle of 30 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.890 TIME= 15:53:50
Meshing of volume 76 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 76 WITH EXCESSIVE DISTORTION ***

2941	2942	2945	2946	2949	2950	2953	2954
2957	2958	2961	2962	2965	2966	2969	2970
2973	2974	2977	2978	2981	2982	2985	2986
2989	2990	2993	2994	2997	2998	3001	3002
3005	3006	3009	3010	3013	3014	3017	3018
3021	3022	3025	3026	3029	3030	3033	3034
3037	3038	3041	3042	3045	3046	3049	3050
3053	3054	3057	3058				

*** WARNING *** CP= 35.130 TIME= 15:53:51
Meshing of volume 77 produced 46 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 77 WITH EXCESSIVE ASPECT RATIO ***

3061	3062	3063	3064	3065	3066	3067	3068
3069	3070	3071	3072	3073	3074	3075	3076
3077	3078	3079	3080	3081	3082	3091	3092
3093	3094	3095	3096	3097	3098	3099	3100
3101	3102	3103	3104	3105	3106	3107	3108
3109	3110	3111	3112	3113	3114		

```
*** WARNING ***                         CP=     35.450   TIME= 15:53:51
Meshing of volume 78 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    78 WITH EXCESSIVE ASPECT RATIO ***
         3121    3122    3123    3124    3125    3126    3151    3152
         3153    3154    3155    3156    3181    3182    3183    3184
         3185    3186    3211    3212    3213    3214    3215    3216


*** WARNING ***                         CP=     36.030   TIME= 15:53:52
Meshing of volume 80 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    80 WITH EXCESSIVE ASPECT RATIO ***
         3361    3362    3363    3364    3365    3366    3367    3368
         3369    3370    3371    3372    3373    3374    3375    3376
         3377    3378    3379    3380    3381    3382    3391    3392
         3393    3394    3395    3396    3397    3398    3399    3400
         3401    3402    3403    3404    3405    3406    3407    3408
         3409    3410    3411    3412    3413    3414


*** WARNING ***                         CP=     36.370   TIME= 15:53:53
Meshing of volume 81 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    81 WITH EXCESSIVE ASPECT RATIO ***
         3421    3422    3423    3424    3425    3426    3451    3452
         3453    3454    3455    3456    3481    3482    3483    3484
         3485    3486    3511    3512    3513    3514    3515    3516


*** WARNING ***                         CP=     36.480   TIME= 15:53:53
Volume 82 area 82 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     36.490   TIME= 15:53:53
Volume 82 area 404 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     36.740   TIME= 15:53:53
Meshing of volume 82 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    82 WITH EXCESSIVE DISTORTION ***
         3543    3544    3547    3548    3551    3552    3555    3556
         3559    3560    3563    3564    3567    3568    3571    3572
         3575    3576    3579    3580    3583    3584    3587    3588
         3591    3592    3595    3596    3599    3600    3603    3604
         3607    3608    3611    3612    3615    3616    3619    3620
         3623    3624    3627    3628    3631    3632    3635    3636
         3639    3640    3643    3644    3647    3648    3651    3652
         3655    3656    3659    3660


*** WARNING ***                         CP=     36.850   TIME= 15:53:54
Volume 83 area 83 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     36.860   TIME= 15:53:54
Volume 83 area 408 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     37.080   TIME= 15:53:54
Meshing of volume 83 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    83 WITH EXCESSIVE DISTORTION ***
         3721    3722    3723    3724    3725    3726    3727    3728
         3729    3730    3731    3732    3733    3734    3735    3736
         3737    3738    3739    3740    3741    3742    3743    3744
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        3745    3746    3747    3748    3749    3750    3751    3752
        3753    3754    3755    3756    3757    3758    3759    3760
        3761    3762    3763    3764    3765    3766    3767    3768
        3769    3770    3771    3772    3773    3774    3775    3776
        3777    3778    3779    3780

*** WARNING ***                         CP=     37.300   TIME= 15:53:54
Meshing of volume 84 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         3781    3782    3783    3784    3785    3786    3787    3788
         3789    3790    3791    3792    3796    3797    3798    3799
         3800    3801    3802    3803    3804    3805    3806    3811
         3812    3813    3814    3815    3816    3817    3818    3819
         3820    3821    3822    3826    3827    3828    3829    3830
         3831    3832    3833    3834    3835    3836

*** WARNING ***                         CP=     37.680   TIME= 15:53:55
Meshing of volume 85 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    85 WITH EXCESSIVE ASPECT RATIO ***
         3841    3842    3843    3856    3857    3858    3871    3872
         3873    3886    3887    3888    3901    3902    3903    3916
         3917    3918    3931    3932    3933    3946    3947    3948

*** WARNING ***                         CP=     38.040   TIME= 15:53:56
Meshing of volume 86 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    86 WITH EXCESSIVE ASPECT RATIO ***
         3961    3976    3991    4006    4021    4036    4051    4066


NUMBER OF VOLUMES MESHED    =     15
MAXIMUM NODE NUMBER         =   6448
MAXIMUM ELEMENT NUMBER      =   4080
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP        1

    6  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     38.800   TIME= 15:53:57
Meshing of volume 88 produced 44 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
         4201    4202    4203    4204    4205    4206    4207    4208
         4209    4210    4211    4212    4213    4214    4215    4216
         4217    4218    4219    4220    4221    4231    4232    4233
         4234    4235    4236    4237    4238    4239    4240    4241
         4242    4243    4244    4245    4246    4247    4248    4249
         4250    4251    4252    4253

*** WARNING ***                         CP=     39.730   TIME= 15:53:58
Meshing of volume 91 produced 44 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.
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     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
         4501    4502    4503    4504    4505    4506    4507    4508
         4509    4510    4511    4512    4513    4514    4515    4516
         4517    4518    4519    4520    4522    4531    4532    4533
         4534    4535    4536    4537    4538    4539    4540    4541
         4542    4543    4544    4545    4546    4547    4548    4549
         4550    4551    4552    4554


NUMBER OF VOLUMES MESHED    =      6
MAXIMUM NODE NUMBER         =   7280
MAXIMUM ELEMENT NUMBER      =   4680
 Mesh Inner Barrier

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.71595
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   177  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.69095     AND  0.71595
  KABS=  0.  TOLERANCE= 0.000000E+00

   114  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
  KABS=  0.  TOLERANCE= 0.000000E+00

  197  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71595     AND  0.78095
  KABS=  0.  TOLERANCE= 0.000000E+00

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.10000E-01 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  147  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      5

MATERIAL NUMBER SET TO     5

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     44.220   TIME= 15:54:10
Meshing of volume 93 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    93 WITH EXCESSIVE ASPECT RATIO ***
```

4681 4696 4711 4726 4741 4756 4771 4786

*** WARNING *** CP= 44.450 TIME= 15:54:10
Meshing of volume 94 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 94 WITH EXCESSIVE ASPECT RATIO ***

4801	4802	4803	4804	4805	4806	4807	4808
4809	4810	4811	4812	4813	4814	4815	4816
4817	4818	4819	4820	4821	4822	4823	4824
4831	4832	4833	4834	4835	4836	4837	4838
4839	4840	4841	4842	4843	4844	4845	4846
4847	4848	4849	4850	4851	4852	4853	4854

*** WARNING *** CP= 45.160 TIME= 15:54:12
Meshing of volume 96 produced 36 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 96 WITH EXCESSIVE ASPECT RATIO ***

4981	4982	4983	4984	4985	4986	4987	4988
4989	4990	4991	4992	4993	4994	4995	4996
4997	4998	5011	5012	5013	5014	5015	5016
5017	5018	5019	5020	5021	5022	5023	5024
5025	5026	5027	5028				

*** WARNING *** CP= 45.380 TIME= 15:54:12
Meshing of volume 97 produced 44 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 97 WITH EXCESSIVE ASPECT RATIO ***

5041	5042	5043	5044	5045	5046	5047	5048
5049	5050	5051	5052	5053	5054	5055	5056
5057	5058	5059	5060	5061	5062	5071	5072
5073	5074	5075	5076	5077	5078	5079	5080
5081	5082	5083	5084	5085	5086	5087	5088
5089	5090	5091	5092				

*** WARNING *** CP= 46.100 TIME= 15:54:14
Meshing of volume 99 produced 44 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 99 WITH EXCESSIVE ASPECT RATIO ***

5221	5222	5223	5224	5225	5226	5227	5228
5229	5230	5231	5232	5233	5234	5235	5236
5237	5238	5239	5240	5241	5242	5251	5252
5253	5254	5255	5256	5257	5258	5259	5260
5261	5262	5263	5264	5265	5266	5267	5268
5269	5270	5271	5272				

*** WARNING *** CP= 46.320 TIME= 15:54:15
Meshing of volume 100 produced 36 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 100 WITH EXCESSIVE ASPECT RATIO ***

5281	5282	5283	5284	5285	5286	5287	5288
5289	5290	5291	5292	5293	5294	5295	5296
5297	5298	5311	5312	5313	5314	5315	5316
5317	5318	5319	5320	5321	5322	5323	5324
5325	5326	5327	5328				

*** WARNING *** CP= 46.990 TIME= 15:54:16
Meshing of volume 102 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 102 WITH EXCESSIVE ASPECT RATIO ***

5461	5462	5463	5464	5465	5466	5467	5468
5469	5470	5471	5472	5473	5474	5475	5476
5477	5478	5479	5480	5481	5482	5483	5484
5491	5492	5493	5494	5495	5496	5497	5498
5499	5500	5501	5502	5503	5504	5505	5506
5507	5508	5509	5510	5511	5512	5513	5514

*** WARNING *** CP= 56.890 TIME= 15:54:36
Volume 230 area 669 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 56.900 TIME= 15:54:37
Volume 230 area 1058 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 56.950 TIME= 15:54:37
Meshing of volume 230 produced 8 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 230 WITH EXCESSIVE DISTORTION ***

6657	6658	6659	6660	6661	6662	6663	6664

*** WARNING *** CP= 56.990 TIME= 15:54:37
Volume 231 area 670 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.000 TIME= 15:54:37
Volume 231 area 1061 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.050 TIME= 15:54:37
Meshing of volume 231 produced 8 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 231 WITH EXCESSIVE DISTORTION ***

6665	6666	6669	6670	6673	6674	6677	6678

*** WARNING *** CP= 57.570 TIME= 15:54:38
Volume 237 area 676 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.580 TIME= 15:54:38
Volume 237 area 1078 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.640 TIME= 15:54:38
Meshing of volume 237 produced 8 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 237 WITH EXCESSIVE DISTORTION ***

6747	6748	6751	6752	6755	6756	6759	6760

*** WARNING *** CP= 57.700 TIME= 15:54:38
Volume 238 area 677 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.710 TIME= 15:54:38
Volume 238 area 1081 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.760 TIME= 15:54:38
Meshing of volume 238 produced 8 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 238 WITH EXCESSIVE DISTORTION ***

6769	6770	6771	6772	6773	6774	6775	6776

*** WARNING *** CP= 59.610 TIME= 15:54:42

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Volume 255 area 694 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     59.630   TIME= 15:54:42
Volume 255 area 1119 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     59.700   TIME= 15:54:42
Meshing of volume 255 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   255 WITH EXCESSIVE DISTORTION ***
         7121    7122    7123    7124    7125    7126    7127    7128
         7130    7132    7134    7136    7138    7142


*** WARNING ***                         CP=     60.410   TIME= 15:54:43
Volume 261 area 700 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     60.430   TIME= 15:54:43
Volume 261 area 1125 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     60.490   TIME= 15:54:43
Meshing of volume 261 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   261 WITH EXCESSIVE DISTORTION ***
         7306    7310    7313    7314    7317    7318    7321    7322
         7323    7324    7325    7326    7327    7328


*** WARNING ***                         CP=     60.600   TIME= 15:54:44
Meshing of volume 262 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   262 WITH EXCESSIVE DISTORTION ***
         7338    7342


*** WARNING ***                         CP=     61.190   TIME= 15:54:45
Meshing of volume 266 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   266 WITH EXCESSIVE DISTORTION ***
         7458    7462


*** WARNING ***                         CP=     61.210   TIME= 15:54:45
Volume 267 area 706 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     61.220   TIME= 15:54:45
Volume 267 area 1131 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     61.290   TIME= 15:54:45
Meshing of volume 267 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   267 WITH EXCESSIVE DISTORTION ***
         7474    7478    7481    7482    7485    7486    7489    7490
         7491    7492    7493    7494    7495    7496


*** WARNING ***                         CP=     61.530   TIME= 15:54:45
Volume 269 area 708 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     61.540   TIME= 15:54:45
Volume 269 area 1133 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     61.600   TIME= 15:54:45
```

```
 Meshing of volume 269 produced 14 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   269 WITH EXCESSIVE DISTORTION ***
          7529    7530    7531    7532    7533    7534    7535    7536
          7538    7540    7542    7544    7546    7550


 NUMBER OF VOLUMES MESHED   =    147
 MAXIMUM NODE NUMBER        =  11541
 MAXIMUM ELEMENT NUMBER     =   7552
  Mesh Upper Inner Barrier Adding Backfill Mass

 INVERT       FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       269 STEP        1

   122  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71595     AND  0.78095
   KABS=  0.  TOLERANCE= 0.000000E+00

    122  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3075
   KABS=  0.  TOLERANCE= 0.000000E+00

   122  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO        92 STEP        1

     30  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 ELEMENT TYPE SET TO      6

 MATERIAL NUMBER SET TO     6

 GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

 *** WARNING ***                          CP=     62.490   TIME= 15:54:47
 Meshing of volume 104 produced 48 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME   104 WITH EXCESSIVE ASPECT RATIO ***
          7553    7554    7555    7556    7557    7558    7559    7560
          7561    7562    7563    7564    7565    7566    7567    7568
          7569    7570    7571    7572    7573    7574    7575    7576
          7583    7584    7585    7586    7587    7588    7589    7590
          7591    7592    7593    7594    7595    7596    7597    7598
          7599    7600    7601    7602    7603    7604    7605    7606


 *** WARNING ***                          CP=     63.210   TIME= 15:54:49
 Meshing of volume 106 produced 36 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME   106 WITH EXCESSIVE ASPECT RATIO ***
          7733    7734    7735    7736    7737    7738    7739    7740
          7741    7742    7743    7744    7745    7746    7747    7748
          7749    7750    7763    7764    7765    7766    7767    7768
          7769    7770    7771    7772    7773    7774    7775    7776
          7777    7778    7779    7780


 *** WARNING ***                          CP=     63.440   TIME= 15:54:49
 Meshing of volume 107 produced 44 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.
```

```
     *** LIST OF ELEMENTS IN VOLUME   107 WITH EXCESSIVE ASPECT RATIO ***
         7793    7794    7795    7796    7797    7798    7799    7800
         7801    7802    7803    7804    7805    7806    7807    7808
         7809    7810    7811    7812    7813    7814    7823    7824
         7825    7826    7827    7828    7829    7830    7831    7832
         7833    7834    7835    7836    7837    7838    7839    7840
         7841    7842    7843    7844

*** WARNING ***                         CP=     64.120   TIME= 15:54:51
Meshing of volume 109 produced 44 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   109 WITH EXCESSIVE ASPECT RATIO ***
         7973    7974    7975    7976    7977    7978    7979    7980
         7981    7982    7983    7984    7985    7986    7987    7988
         7989    7990    7991    7992    7993    7994    8003    8004
         8005    8006    8007    8008    8009    8010    8011    8012
         8013    8014    8015    8016    8017    8018    8019    8020
         8021    8022    8023    8024

*** WARNING ***                         CP=     64.350   TIME= 15:54:51
Meshing of volume 110 produced 36 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   110 WITH EXCESSIVE ASPECT RATIO ***
         8033    8034    8035    8036    8037    8038    8039    8040
         8041    8042    8043    8044    8045    8046    8047    8048
         8049    8050    8063    8064    8065    8066    8067    8068
         8069    8070    8071    8072    8073    8074    8075    8076
         8077    8078    8079    8080

*** WARNING ***                         CP=     65.030   TIME= 15:54:52
Meshing of volume 112 produced 48 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   112 WITH EXCESSIVE ASPECT RATIO ***
         8213    8214    8215    8216    8217    8218    8219    8220
         8221    8222    8223    8224    8225    8226    8227    8228
         8229    8230    8231    8232    8233    8234    8235    8236
         8243    8244    8245    8246    8247    8248    8249    8250
         8251    8252    8253    8254    8255    8256    8257    8258
         8259    8260    8261    8262    8263    8264    8265    8266

*** WARNING ***                         CP=     65.410   TIME= 15:54:53
Meshing of volume 113 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   113 WITH EXCESSIVE ASPECT RATIO ***
         8273    8274    8303    8304    8333    8334    8363    8364


NUMBER OF VOLUMES MESHED   =     30
MAXIMUM NODE NUMBER        =  12897
MAXIMUM ELEMENT NUMBER     =   8616
 Mesh Lower Outer Barrier and Lids
 mesh upper outer barrier adding backfill mass

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   555  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.
```

```
SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     67.880   TIME= 15:54:58
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   555

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   606  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   Z
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     68.310   TIME= 15:54:59
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=  1161
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  1.0675     AND   1.5450
  KABS=  0.  TOLERANCE= 0.000000E+00

  1818  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71495     AND  0.71695
  KABS=  0.  TOLERANCE= 0.000000E+00

   183  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    24  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   12897 BY       1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP       1

   269  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO     1133 STEP       1

 1133  AREAS (OF  1133  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO     1604 STEP       1

 1604  LINES (OF  1604  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO     9001 STEP       1

   690  KEYPOINTS (OF    690  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO     8616 STEP       1
```

```
  8616  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT    FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO    12897 STEP        1

 12897  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism3.db
 FOR POSSIBLE RESUME FROM THIS POINT


***** ROUTINE COMPLETED *****  CP =        77.040


*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A MODAL ANALYSIS
 THIS WILL BE A NEW ANALYSIS


USE SUBSPACE ITERATION METHOD
 EXTRACT    8 MODES
 NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism3.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****

*** WARNING ***                         CP=     88.350   TIME= 15:55:38
Element 2881 has an angle between adjacent edges of 36.9687852 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.350   TIME= 15:55:38
Element 2881 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.350   TIME= 15:55:38
Element 2882 has an angle between adjacent edges of 36.9602219 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.360   TIME= 15:55:38
Element 2882 has an angle between adjacent edges of 143.031215 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.360   TIME= 15:55:38
Element 2883 has an angle between adjacent edges of 36.9687852 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.370   TIME= 15:55:38
Element 2883 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     88.370   TIME= 15:55:38
Element 2884 has an angle between adjacent edges of 36.9602219 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

*** WARNING *** CP= 88.370 TIME= 15:55:38
Element 2884 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.370 TIME= 15:55:38
Element 2885 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.370 TIME= 15:55:38
Element 2885 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2886 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2886 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2887 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2887 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2888 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2888 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2889 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2889 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2890 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.380 TIME= 15:55:38
Element 2890 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.390 TIME= 15:55:38
Element 2891 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.390 TIME= 15:55:38
Element 2891 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.400 TIME= 15:55:38
Element 2892 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.400 TIME= 15:55:38
Element 2892 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.400 TIME= 15:55:38
Element 2893 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.400 TIME= 15:55:38
Element 2893 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.400 TIME= 15:55:38
Element 2894 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2894 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2895 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2895 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2896 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2896 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.410 TIME= 15:55:38
Element 2897 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.420 TIME= 15:55:38
Element 2897 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.420 TIME= 15:55:38
Element 2898 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.420 TIME= 15:55:38
Element 2898 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.420 TIME= 15:55:38
Element 2899 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.420 TIME= 15:55:38
Element 2899 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2900 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2900 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2901 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2901 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2902 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.430 TIME= 15:55:38
Element 2902 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.440 TIME= 15:55:38
Element 2903 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.440 TIME= 15:55:38
Element 2903 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.440 TIME= 15:55:38
Element 2904 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.440 TIME= 15:55:38
Element 2904 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.440 TIME= 15:55:38
Element 2905 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2905 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2906 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2906 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2907 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2907 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.450 TIME= 15:55:38
Element 2908 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2908 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2909 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2909 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2910 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2910 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.460 TIME= 15:55:38
Element 2911 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38
Element 2911 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38
Element 2912 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38

Element 2912 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38
Element 2913 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38
Element 2913 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.470 TIME= 15:55:38
Element 2914 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2914 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2915 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2915 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2916 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2916 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.480 TIME= 15:55:38
Element 2917 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.490 TIME= 15:55:38
Element 2917 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.490 TIME= 15:55:38
Element 2918 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.490 TIME= 15:55:38
Element 2918 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.490 TIME= 15:55:38
Element 2919 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.490 TIME= 15:55:38
Element 2919 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2920 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2920 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2921 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2921 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2922 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2922 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2923 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.500 TIME= 15:55:38
Element 2923 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.510 TIME= 15:55:38
Element 2924 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.510 TIME= 15:55:38
Element 2924 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.510 TIME= 15:55:38
Element 2925 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2925 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2926 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2926 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2927 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45

degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2927 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.520 TIME= 15:55:38
Element 2928 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.530 TIME= 15:55:38
Element 2928 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.530 TIME= 15:55:38
Element 2929 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.530 TIME= 15:55:38
Element 2929 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.530 TIME= 15:55:38
Element 2930 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.530 TIME= 15:55:38
Element 2930 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2931 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2931 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2932 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2932 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2933 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.540 TIME= 15:55:38
Element 2933 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2934 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2934 has an angle between adjacent edges of 149.527065 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2935 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2935 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2936 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.550 TIME= 15:55:38
Element 2936 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.560 TIME= 15:55:38
Element 2937 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.560 TIME= 15:55:38
Element 2937 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2938 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2938 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2939 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2939 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2940 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.570 TIME= 15:55:38
Element 2940 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.580 TIME= 15:55:38
Element 2941 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.580 TIME= 15:55:38
Element 2941 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.580 TIME= 15:55:38
Element 2942 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.580 TIME= 15:55:38
Element 2942 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.590 TIME= 15:55:38
Element 2945 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.590 TIME= 15:55:38
Element 2945 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.590 TIME= 15:55:38
Element 2946 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.590 TIME= 15:55:38
Element 2946 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.590 TIME= 15:55:38
Element 2949 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.600 TIME= 15:55:38
Element 2949 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.600 TIME= 15:55:38
Element 2950 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.600 TIME= 15:55:38
Element 2950 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.600 TIME= 15:55:38
Element 2953 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.600 TIME= 15:55:38
Element 2953 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2954 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2954 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2957 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2957 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2958 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2958 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.610 TIME= 15:55:38
Element 2961 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.620 TIME= 15:55:38
Element 2961 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.620 TIME= 15:55:38
Element 2962 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.620 TIME= 15:55:38
Element 2962 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.620 TIME= 15:55:38
Element 2965 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.620 TIME= 15:55:38
Element 2965 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.630 TIME= 15:55:38
Element 2966 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.630 TIME= 15:55:38
Element 2966 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.630 TIME= 15:55:38
Element 2969 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.630 TIME= 15:55:38
Element 2969 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 88.640 TIME= 15:55:38
Element 2970 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.640 TIME= 15:55:38
Element 2970 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.640 TIME= 15:55:38
Element 2973 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.640 TIME= 15:55:38
Element 2973 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.640 TIME= 15:55:38
Element 2974 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.650 TIME= 15:55:38
Element 2974 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.650 TIME= 15:55:38
Element 2977 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.650 TIME= 15:55:38
Element 2977 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.650 TIME= 15:55:38
Element 2978 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.650 TIME= 15:55:38
Element 2978 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.660 TIME= 15:55:38
Element 2981 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.660 TIME= 15:55:38
Element 2981 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.660 TIME= 15:55:38
Element 2982 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.660 TIME= 15:55:38
Element 2982 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.670 TIME= 15:55:38
Element 2985 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.670 TIME= 15:55:38
Element 2985 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.670 TIME= 15:55:38
Element 2986 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.670 TIME= 15:55:38
Element 2986 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.680 TIME= 15:55:38
Element 2989 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.680 TIME= 15:55:38
Element 2989 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.680 TIME= 15:55:38
Element 2990 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.680 TIME= 15:55:38
Element 2990 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.690 TIME= 15:55:38
Element 2993 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.690 TIME= 15:55:38
Element 2993 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.690 TIME= 15:55:38
Element 2994 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.690 TIME= 15:55:38
Element 2994 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.690 TIME= 15:55:38
Element 2997 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 88.700 TIME= 15:55:38
Element 2997 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

```
*** WARNING ***                          CP=     88.700   TIME= 15:55:38
Element 2998 has an angle between adjacent edges of 143.031215 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.700   TIME= 15:55:38
Element 2998 has an angle between adjacent edges of 143.031215 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.700   TIME= 15:55:38
Element 3001 has an angle between adjacent edges of 36.9776312 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.700   TIME= 15:55:38
Element 3001 has an angle between adjacent edges of 149.518219 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.700   TIME= 15:55:38
Element 3002 has an angle between adjacent edges of 143.022369 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.710   TIME= 15:55:38
Element 3002 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.710   TIME= 15:55:38
Element 3005 has an angle between adjacent edges of 36.9776312 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.710   TIME= 15:55:38
Element 3005 has an angle between adjacent edges of 149.518219 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.710   TIME= 15:55:38
Element 3006 has an angle between adjacent edges of 143.022369 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.710   TIME= 15:55:38
Element 3006 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.720   TIME= 15:55:38
Element 3009 has an angle between adjacent edges of 36.9776312 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.720   TIME= 15:55:38
Element 3009 has an angle between adjacent edges of 149.518219 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.720   TIME= 15:55:38
Element 3010 has an angle between adjacent edges of 143.022369 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     88.720   TIME= 15:55:38
Element 3010 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

```
 *** WARNING ***                         CP=      88.720   TIME= 15:55:38
Element 3013 has an angle between adjacent edges of 36.9776312 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3013 has an angle between adjacent edges of 149.518219 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3014 has an angle between adjacent edges of 143.022369 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3014 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3017 has an angle between adjacent edges of 36.9776312 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3017 has an angle between adjacent edges of 149.518219 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3018 has an angle between adjacent edges of 143.022369 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

 *** WARNING ***                         CP=      88.730   TIME= 15:55:38
Element 3018 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*****************************************************************************
Error messages discontinued after 200 messages were displayed.
 More may exist.  See ( seism3.err ) for suppressed messages.
*****************************************************************************

 *** NOTE ***                            CP=      93.050   TIME= 15:55:48
The model data was checked and warning messages were found.
 Please review output or errors file ( seism3.err ) for these warning
 messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX    15:55:48  APR 09, 1996 CP=     93.050
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337    FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

 PROBLEM DIMENSIONALITY. . . . . .3-D
 DEGREES OF FREEDOM. . . . . UX   UY   UZ
 ANALYSIS TYPE . . . . . .MODAL
    EXTRACTION METHOD. . . . . .SUBSPACE
 NUMBER OF MODES TO EXTRACT. . . . . .     8

                  L O A D   S T E P   O P T I O N S

 LOAD STEP NUMBER. . . . . .     1
```

***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

TOTAL MASS = 11276.

CENTROID		MOM. OF INERTIA ABOUT ORIGIN		MOM. OF INERTIA ABOUT CENTROID	
XC =	0.33144	IXX =	0.2204E+05	IXX =	6434.
YC =	0.22149	IYY =	0.2173E+05	IYY =	5447.
ZC =	1.1552	IZZ =	3716.	IZZ =	1924.
		IXY =	-877.7	IXY =	-49.96
		IYZ =	-2882.	IYZ =	3.712
		IZX =	-4320.	IZX =	-2.487

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
2	5499.34
3	332.670
4	180.515
5	187.722
6	5076.10

Range of element maximum matrix coefficients in global coordinates
Maximum= 2.223392131E+11 at element 5101.
Minimum= 193590088 at element 6382.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	15.670	0.006
3	1560	SOLID45	9.840	0.006
4	600	SOLID45	3.810	0.006
5	2872	SOLID45	17.600	0.006
6	1064	SOLID45	6.370	0.006

Time at end of element matrix formulation CP= 156.68.

Estimated number of active DOF= 37506.
Maximum wavefront= 1397.

Time at end of matrix triangularization CP= 248.36.

SUBSPACE SIZE OF 12 VECTORS USED FOR CALCULATION OF FIRST 8 EIGENVECTORS.
MAXIMUM ITERATIONS = 100
NUMBER OF EQUATIONS = 37506
MAXIMUM WAVEFRONT = 1397
ITERATIONS PER SHIFT = 5
MAXIMUM MODES STORED = 12
MAXIMUM EIGENVALUE = 0.10000E+07
WORK SPACE (MBYTE) = 8.0875

Equation solver maximum pivot= 6.080812157E+11 at node 5223 UX.

Equation solver minimum pivot= 3456988.12 at node 4222 UY.

***** ITERATION 1 COMPLETE ***** CP= 3082.170 WALL= 17.4825

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	53.345771	0.00000000E+00	0.10000E+01
2	62.344026	0.00000000E+00	0.10000E+01
3	73.616248	0.00000000E+00	0.10000E+01

4	79.667707	0.00000000E+00	0.10000E+01
5	85.814437	0.00000000E+00	0.10000E+01
6	90.660704	0.00000000E+00	0.10000E+01
7	103.54002	0.00000000E+00	0.10000E+01
8	117.48446	0.00000000E+00	0.10000E+01
9	121.03647	0.00000000E+00	0.10000E+01
10	129.52718	0.00000000E+00	0.10000E+01
11	143.57647	0.00000000E+00	0.10000E+01
12	164.59681	0.00000000E+00	0.10000E+01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 1
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2647.810
CP TIME SINCE LAST SHIFT= 181.410

***** ITERATION 2 COMPLETE ***** CP= 3257.840 WALL= 17.6108

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	44.003270	53.345771	0.46970E+00
2	44.223786	62.344026	0.98737E+00
3	52.812972	73.616248	0.94297E+00
4	53.242224	79.667707	0.12390E+01
5	58.705054	85.814437	0.11368E+01
6	70.532590	90.660704	0.65218E+00
7	73.378538	103.54002	0.99103E+00
8	74.140474	117.48446	0.15110E+01
9	76.978442	121.03647	0.14723E+01
10	89.640803	129.52718	0.10879E+01
11	96.089629	143.57647	0.12326E+01
12	102.10483	164.59681	0.15987E+01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2647.810
CP TIME SINCE LAST SHIFT= 357.070

***** ITERATION 3 COMPLETE ***** CP= 3429.810 WALL= 17.7456

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	39.988050	44.003270	0.21090E+00
2	43.704886	44.223786	0.23887E-01
3	52.293465	52.812972	0.19968E-01
4	52.614799	53.242224	0.23992E-01
5	57.589679	58.705054	0.39110E-01
6	68.896234	70.532590	0.48066E-01
7	69.729849	73.378538	0.10739E+00
8	72.475762	74.140474	0.46466E-01
9	73.420455	76.978442	0.99269E-01
10	84.911236	89.640803	0.11450E+00
11	91.097643	96.089629	0.11260E+00
12	94.477554	102.10483	0.16798E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2647.810

CP TIME SINCE LAST SHIFT= 529.040

***** ITERATION 4 COMPLETE ***** CP= 3602.300 WALL= 17.8794

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	39.849856	39.988050	0.69477E-02
2	43.688840	43.704886	0.73471E-03
3	52.240361	52.293465	0.20341E-02
4	52.592267	52.614799	0.85705E-03
5	57.512834	57.589679	0.26741E-02
6	68.615908	68.896234	0.81875E-02
7	69.177229	69.729849	0.16041E-01
8	71.550044	72.475762	0.26043E-01
9	73.288091	73.420455	0.36154E-02
10	84.022436	84.911236	0.21268E-01
11	89.679658	91.097643	0.31873E-01
12	91.456013	94.477554	0.67168E-01

ITERATIONS SINCE LAST SHIFT= 4
TOTAL NUMBER OF ITERATIONS= 4
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2647.810
CP TIME SINCE LAST SHIFT= 701.530

***** ITERATION 5 COMPLETE ***** CP= 3773.710 WALL= 18.0128

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	39.844939	39.849856	0.24686E-03
2	43.688028	43.688840	0.37181E-04
3	52.233985	52.240361	0.24413E-03
4	52.591237	52.592267	0.39189E-04
5	57.505977	57.512834	0.23847E-03
6	68.504780	68.615908	0.32470E-02
7	69.058854	69.177229	0.34312E-02
8	71.276549	71.550044	0.76889E-02
9	73.255113	73.288091	0.90057E-03
10	83.754724	84.022436	0.64030E-02
11	88.856115	89.679658	0.18622E-01
12	89.999030	91.456013	0.32640E-01

ITERATIONS SINCE LAST SHIFT= 5
TOTAL NUMBER OF ITERATIONS= 5
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2647.810
CP TIME SINCE LAST SHIFT= 872.950

*** NOTE *** CP= 3773.720 TIME= 18:00:46
NEW SHIFT= 37.800228.

***** ITERATION 6 COMPLETE ***** CP= 6528.930 WALL= 19.3708

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	39.844753	39.844939	0.93388E-05
2	43.687981	43.688028	0.21586E-05
3	52.233177	52.233985	0.30929E-04
4	52.591174	52.591237	0.23894E-05
5	57.505136	57.505977	0.29268E-04

6	68.450441	68.504780	0.15883E-02
7	69.022920	69.058854	0.10415E-02
8	71.172282	71.276549	0.29321E-02
9	73.241359	73.255113	0.37562E-03
10	83.626376	83.754724	0.30719E-02
11	87.778308	88.856115	0.24708E-01
12	89.397805	89.999030	0.13496E-01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 6
NUMBER OF MODES CONVERGED= 2
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 37.800
CP TIME FOR TRIANGULARIZATION= 2579.580
CP TIME SINCE LAST SHIFT= 175.630

***** ITERATION 7 COMPLETE ***** CP= 6680.380 WALL= 19.4931

****** PREVIOUS CONVERGED EIGENVALUES *****
1 39.8447528 2 43.6879808

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
3	52.233147	52.233177	0.11624E-05
4	52.591172	52.591174	0.53692E-07
5	57.505084	57.505136	0.17882E-05
6	68.435788	68.450441	0.42827E-03
7	69.014857	69.022920	0.23367E-03
8	71.144132	71.172282	0.79151E-03
9	73.236444	73.241359	0.13421E-03
10	83.564161	83.626376	0.14896E-02
11	86.844169	87.778308	0.21629E-01
12	89.185475	89.397805	0.47672E-02

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 7
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 37.800
CP TIME FOR TRIANGULARIZATION= 2579.580
CP TIME SINCE LAST SHIFT= 327.080

***** ITERATION 8 COMPLETE ***** CP= 6812.440 WALL= 19.6039

****** PREVIOUS CONVERGED EIGENVALUES *****
1 39.8447528 2 43.6879808 3 52.2331471
4 52.5911724 5 57.5050844

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
6	68.432226	68.435788	0.10411E-03
7	69.012906	69.014857	0.56539E-04
8	71.136261	71.144132	0.22129E-03
9	73.234469	73.236444	0.53959E-04
10	83.528073	83.564161	0.86427E-03
11	86.124704	86.844169	0.16777E-01
12	89.070261	89.185475	0.25887E-02

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 8
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 37.800
CP TIME FOR TRIANGULARIZATION= 2579.580
CP TIME SINCE LAST SHIFT= 459.140

```
    *****  ITERATION    9  COMPLETE *****  CP=    6942.030  WALL=     19.7103

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  39.8447528            2  43.6879808            3  52.2331471
       4  52.5911724            5  57.5050844

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   6     68.431408        68.432226        0.23914E-04
   7     69.012423        69.012906        0.14002E-04
   8     71.134038        71.136261        0.62523E-04
   9     73.233635        73.234469        0.22771E-04
  10     83.505178        83.528073        0.54844E-03
  11     85.586995        86.124704        0.12605E-01
  12     88.985099        89.070261        0.19150E-02

ITERATIONS SINCE LAST SHIFT=     4
TOTAL NUMBER OF ITERATIONS=      9
NUMBER OF MODES CONVERGED=       5
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=            37.800
CP TIME FOR TRIANGULARIZATION=  2579.580
CP TIME SINCE LAST SHIFT=        588.730


    *****  ITERATION   10  COMPLETE *****  CP=    7072.850  WALL=     19.8150

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  39.8447528            2  43.6879808            3  52.2331471
       4  52.5911724            5  57.5050844

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   6     68.431226        68.431408        0.53128E-05
   7     69.012301        69.012423        0.35347E-05
   8     71.133403        71.134038        0.17832E-04
   9     73.233277        73.233635        0.97754E-05
  10     83.490085        83.505178        0.36157E-03
  11     85.190966        85.586995        0.93190E-02
  12     88.907801        88.985099        0.17396E-02

ITERATIONS SINCE LAST SHIFT=     5
TOTAL NUMBER OF ITERATIONS=     10
NUMBER OF MODES CONVERGED=       7
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=            37.800
CP TIME FOR TRIANGULARIZATION=  2579.580
CP TIME SINCE LAST SHIFT=        719.550

*** NOTE ***                          CP=   7072.850   TIME= 19:48:54
NEW SHIFT= 71.0288527.

*** NOTE ***                          CP=   9650.010   TIME= 21:02:37
STURM number= 7 should be 7.


    *****  ITERATION   11  COMPLETE *****  CP=    9769.900  WALL=     21.1494

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  39.8447528            2  43.6879808            3  52.2331471
       4  52.5911724            5  57.5050844            6  68.4312258
       7  69.0123013

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   8     71.133139        71.133403        0.74431E-05
```

```
 *** NOTE ***                                CP=    9769.900   TIME= 21:08:58
 NEW SHIFT= 71.3459071.

 *** NOTE ***                                CP=   12323.700   TIME= 23:04:00
 STURM number= 8 should be 8.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   23:04:03  APR 09, 1996 CP=  12324.110
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)

    1       39.844753
    2       43.687981
    3       52.233147
    4       52.591172
    5       57.505084
    6       68.431226
    7       69.012301
    8       71.133139


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37506
  R.M.S. WAVEFRONT SIZE =   903.5


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096
       44.625 MB WRITTEN ON ELEMENT MATRIX FILE: seism3.emat
       29.703 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism3.esav
       21.094 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism3.full
        2.719 MB WRITTEN ON MODAL MATRIX FILE: seism3.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =      12331.270


 *****  ANSYS SOLUTION ROUTINE  *****

 PERFORM AN EXPANSION PASS


 NUMBER OF MODES TO EXPAND=      8
  CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   23:04:28  APR 09, 1996 CP=  12331.280
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill

                    S O L U T I O N   O P T I O N S
```

```
  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
     EXPANSION PASS . . . . . .ON
  NUMBER OF MODES TO EXPAND . . . . . 8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                    L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . 1
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY   COMPONENT
      ALL         ALL


*** NOTE ***                            CP=  12360.460   TIME= 23:06:24
Page file used.

  *** ELEMENT RESULT CALCULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       9.500    0.004
    3    1560  SOLID45       6.180    0.004
    4     600  SOLID45       2.170    0.004
    5    2872  SOLID45      10.970    0.004
    6    1064  SOLID45       4.010    0.004

  *** NODAL LOAD CALCULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       0.990    0.000
    3    1560  SOLID45       0.430    0.000
    4     600  SOLID45       0.300    0.001
    5    2872  SOLID45       1.080    0.000
    6    1064  SOLID45       0.390    0.000


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
     106.094 MB WRITTEN ON RESULTS FILE: seism3.rst

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      12632.980



*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A SPECTRUM ANALYSIS
 THIS WILL BE A NEW ANALYSIS

*** NOTE ***                            CP=  12632.980   TIME= 23:25:02
Some analysis options have been reset to their defaults.  Please verify
 current settings or respecify as required.


USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
 USE ALL MODES FROM THE MODAL ANALYSIS
 INCLUDE STRESS RESPONSES IN THE CALCULATIONS

SEISMIC EXCITATION DIRECTION = 0.00000E+00  1.0000      0.00000E+00

SPECTRUM TYPE KEY=  2  FACTOR=  1.00000

FREQ= 0.100       100.      0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
```

```
 NUMBER OF FREQUENCIES IN TABLE =  2

 DAMPING= 0.00000E+00  SV=      16.285          16.285        0.00000E+00
                           0.00000E+00     0.00000E+00     0.00000E+00
                           0.00000E+00     0.00000E+00     0.00000E+00


 COMBINE MODES USING THE SRSS METHOD
  WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

 WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
   FOR ALL APPLICABLE ENTITIES

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism3.db
  FOR POSSIBLE RESUME FROM THIS POINT

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   23:25:51  APR 09, 1996 CP=  12646.730
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .SPECTRUM
      SPECTRUM TYPE. . . . . .SINGLE POINT
   NUMBER OF MODES TO BE USED. . . . . .     8
   ELEMENT RESULTS CALCULATION . . . . . .ON

                    L O A D   S T E P   O P T I O N S

   LOAD STEP NUMBER. . . . . .     1
   SPECTRUM LOADING TYPE . . . . . .ACCELERATION
   EXCITATION DIRECTION. . . . . 0.00000E+00  1.0000     0.00000E+00
   MODE COMBINATION TYPE . . . . . .SRSS
      SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
   PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
   DATABASE OUTPUT CONTROLS
      ITEM      FREQUENCY   COMPONENT
       ALL         ALL

1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   23:26:16  APR 09, 1996 CP=  12651.110
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


   SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07


     SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

 MODE      FREQUENCY     DAMPING       SV          MODE COEF.

    1         39.84          0.0000  16.285         -0.4040E-03
    2         43.69          0.0000  16.285          0.1889E-01
    3         52.23          0.0000  16.285         -0.6588E-02
    4         52.59          0.0000  16.285         -0.1051E-02
    5         57.51          0.0000  16.285         -0.8130E-03
    6         68.43          0.0000  16.285         -0.1081E-03
    7         69.01          0.0000  16.285          0.2726E-03
```

```
   8       71.13          0.0000  16.285          0.5794E-03

                  MODAL COMBINATION COEFFICIENTS

          MODE=   1  FREQUENCY=      39.845  COUPLING COEF.=   1.000
          MODE=   2  FREQUENCY=      43.688  COUPLING COEF.=   1.000
          MODE=   3  FREQUENCY=      52.233  COUPLING COEF.=   1.000
          MODE=   4  FREQUENCY=      52.591  COUPLING COEF.=   1.000
          MODE=   5  FREQUENCY=      57.505  COUPLING COEF.=   1.000
          MODE=   6  FREQUENCY=      68.431  COUPLING COEF.=   1.000
          MODE=   7  FREQUENCY=      69.012  COUPLING COEF.=   1.000
          MODE=   8  FREQUENCY=      71.133  COUPLING COEF.=   1.000

SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE seism3.mcom


  *** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37506
 R.M.S. WAVEFRONT SIZE =   903.5


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      12651.110


PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism3.db
 FOR POSSIBLE RESUME FROM THIS POINT


NUMBER OF WARNING MESSAGES ENCOUNTERED=         999
NUMBER OF ERROR   MESSAGES ENCOUNTERED=           0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=          788
MAXIMUM RECORD NUMBER   =          599
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       37.438

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                      HP 9000/7XX            |
|                                                                        |
|       CP TIME      (sec) =      12660.550       TIME  =  23:26:46      |
|       ELAPSED TIME (sec) =      27242.000       DATE  =  04/09/96      |
|                                                                        |
*------------------------------------------------------------------------*
```

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AFTER YOU HAVE READ AND UNDERSTAND THE PREVIOUS DISCLAIMER,
PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postf3
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.150   TIME= 08:51:47
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postf3    08:51:48  APR 10, 1996 CP=      0.160

    1  resume,seism3,db
    2  /filnam,seism3
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /out,seism3,res
    7  /com, 100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
    8  /com,  75% Degradation of Inner Barrier
    9  /com,
   10  /com,
   11  /com, MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER
   12  /com,
   13  /com, No Outer Barrier
   14  !esel,s,type,,6,7
   15  !nsle
   16  !esln
   17  !set,1,5
   18  !nsort,s,int,0,0,1
   19  !prns,s,prin
   20
   21  /com,
   22  /com,
   23  /com, MAXIMUM STRESS INTENSITY IN THE INNER BARRIER
   24  /com,
   25  /com,
   26  esel,s,type,,5,6
   27  nsle
   28  esln
   29  nsort,s,int,0,0,1
   30  prns,s,prin
   31
   32  /com,
   33  /com,
   34  /com, MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES
   35  /com,
   36  /com,
   37  esel,s,type,,1
   38  esel,a,type,,3,4
   39  nsle
   40  esln
   41  nsort,s,int,0,0,1
   42  prns,s,prin
   43
   44  /com,
   45  /com,
   46  /com, MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES
   47  /com,
   48  /com,
   49  esel,s,type,,2
   50  nsle
```

```
   51  esln
   52  nsort,s,int,0,0,1
   53  prns,s,prin
   54
   55  /out
   56  fini
   57  /exit,nosave
   58  /eof

 RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

 /INPUT FILE= /ansys51/docu/start.ans  LINE=       0

 ABBREVIATION= REPLOT    /REPLOT

 PARAMETER PI       =     3.141593
    ***********************************************************************
    ANSYS STARTUP FILE  start.ans
    ***********************************************************************

 ABBREVIATION= VEC       /show,,,1,

 ABBREVIATION= RAS       /show,,,0,

 ABBREVIATION= INP       /input,,inp,

 ABBREVIATION= ESC       /exit,nosav,

 ABBREVIATION= K1        /pnum,kp  ,1,

 ABBREVIATION= K0        /pnum,kp  ,0,

 ABBREVIATION= L1        /pnum,line,1,

 ABBREVIATION= L0        /pnum,line,0,

 ABBREVIATION= A1        /pnum,area,1,

 ABBREVIATION= A0        /pnum,area,0,

 ABBREVIATION= V1        /pnum,volu,1,

 ABBREVIATION= V0        /pnum,volu,0,

 ABBREVIATION= N1        /pnum,node,1,

 ABBREVIATION= N0        /pnum,node,0,

 ABBREVIATION= E1        /pnum,elem,1,

 ABBREVIATION= E0        /pnum,elem,0,

 ABBREVIATION= M1        /pnum,mat ,1,

 ABBREVIATION= M0        /pnum,mat ,0,

 ABBREVIATION= R1        /pnum,real,1,

 ABBREVIATION= R0        /pnum,real,0,

 ABBREVIATION= T1        /pnum,type,1,

 ABBREVIATION= T0        /pnum,type,0,

 ABBREVIATION= C1        /number,1,

 ABBREVIATION= C0        /number,0,

 ABBREVIATION= X3D       /show,3d,
```

```
ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ********************************************************************
   END  start.ans
   ********************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ********************************************************************

RESUME ANSYS DATA FROM FILE NAME=seism3.db

*** ANSYS GLOBAL STATUS ***

TITLE =  21 PWR Tube Seismic Analysis With Backfill
ANALYSIS TYPE =  SPECTRUM
NUMBER OF ELEMENT TYPES =      6
  8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
 12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
   690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
  1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
  1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
   269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
MAXIMUM LINEAR PROPERTY NUMBER        =       6
ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
NUMBER OF SPECIFIED CONSTRAINTS       =    1185

INITIAL JOBNAME = postf3
CURRENT JOBNAME = postf3

CURRENT JOBNAME REDEFINED AS seism3
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303          VERSION=HP 9000/7XX   08:51:58  APR 10, 1996 CP=      5.530
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


        ***** ANSYS RESULTS INTERPRETATION (POST1) *****


USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

*** NOTE ***                            CP=      7.120   TIME= 08:52:00
Page file used.

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
  TIME/FREQUENCY=  57.505
TITLE=  21 PWR Tube Seismic Analysis With Backfill

/INPUT FILE= seism3.mcom  LINE=       0
ANSYS REVISION  5.1              24    23:26:16    04/09/1996
 seism3.mcom

CURRENT LOAD SET IN DATABASE IS ERASED
```

```
LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.40396E-03

COPY LOAD CASE   1 FROM FILE TO DATABASE

SQUARE THE CURRENT LOAD SET IN DATABASE

*** NOTE ***                            CP=      30.880   TIME= 08:53:05
Load case combination data may not be correct unless viewed in the
 solution phase coordinate system (RSYS=SOLU).

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.18891E-01

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.18891E-01 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.18891E-01 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.65883E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.65883E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.65883E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.10506E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.10506E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.10506E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.81302E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.81302E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.81302E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.10809E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.10809E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.10809E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill
```

```
 LOAD CASE   1 FACTOR SET TO 0.27262E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.27262E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.27262E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
 FILE= seism3.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.57938E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.57938E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.57938E-03 ABS=   0

 TAKE SQRT OF CURRENT LOAD SET IN DATABASE

 /OUTPUT FILE= seism3.res

 EXIT THE ANSYS POST1 DATABASE PROCESSOR


 ***** ROUTINE COMPLETED *****  CP =       110.270


 EXIT ANSYS WITHOUT SAVING DATABASE


 NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
 NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

 ***  PAGE FILE USED  ***
 NUMBER OF R/W OPERATIONS=        15583
 MAXIMUM RECORD NUMBER   =          554
 RECORD SIZE (I*4 WORDS) =        16384
 PAGE FILE SIZE (MB)     =       34.625

*------------------------------------------------------------------------------*
|                                                                              |
|                          ANSYS RUN COMPLETED                                 |
|                                                                              |
|------------------------------------------------------------------------------|
|                                                                              |
|              REV. 5.1   24                    HP 9000/7XX                    |
|                                                                              |
|       CP TIME      (sec) =        110.280      TIME  =  08:56:26             |
|       ELAPSED TIME (sec) =        280.000      DATE  =  04/10/96             |
|                                                                              |
*------------------------------------------------------------------------------*
```

```
*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
```

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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postlin3
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.200   TIME= 09:32:22
There are no parameters and no abbreviations defined.

38303             VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postlin3  09:32:22  APR 10, 1996 CP=      0.210

    1 resume,seism3,db
    2 /filnam,seism3
    3 /post1
    4 set,1,5
    5 /input,,mcom
    6 /com, Outer Barrier Stress Distribution
    7 !nsel,s,node,,13294
    8 !nsel,a,node,,13367
    9 !nsel,a,node,,12430
   10 !nsel,a,node,,12503
   11 !nsel,a,node,,7840
   12 !esln
   13 !lpath,7840,13294
   14 !/out,obstress
   15 /com, Outer Barrier Linearized Stresses at Location of Peak Stress
   16 !prsect
   17 !/out
   18 !/show,obdist,grph
   19 !plsect,s,int
   20 !/show,term
   21 /com, Inner Barrier Stress Distribution
   22 nsel,s,node,,12757
   23 nsel,a,node,,12765
   24 nsel,a,node,,12761
   25 esln
   26 lpath,12757,12761
   27 /out,ibstress
   28 /com, Inner Barrier Linearized Stresses at Location of Peak Stress
   29 prsect
   30 /out
   31 /show,ibdist,grph
   32 plsect,s,int
   33 /show,term
   34 /com, Basket Stress Distribution
   35 nsel,s,node,,4388
   36 nsel,a,node,,4438
   37 nsel,a,node,,4310
   38 esln
   39 lpath,4388,4310
   40 /out,bktstress
   41 /com, Basket Tubes and Guides Linearized Stresses at Location of Peak Stress
   42 prsect
   43 /out
   44 /show,bktdist,grph
   45 plsect,s,int
   46 /show,term
   47 /com, Criticality Control Plate Stress Distribution
   48 nsel,s,node,,940
   49 nsel,a,node,,1100
   50 nsel,a,node,,1064
```

```
   51  esln
   52  lpath,940,1064
   53  /out,pltstress
   54  /com, Criticality Control Plates Linearized Stresses at Location of Peak Stress
   55  prsect
   56  /out
   57  /show,pltdist,grph
   58  plsect,s,int
   59  /show,term
   60  fini
   61  /exit,nosave

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***********************************************************************
   ANSYS STARTUP FILE  start.ans
   ***********************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,
```

```
ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ****************************************************************
   END  start.ans
   ****************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ****************************************************************

RESUME ANSYS DATA FROM FILE NAME=seism3.db

*** ANSYS GLOBAL STATUS ***

TITLE =  21 PWR Tube Seismic Analysis With Backfill
ANALYSIS TYPE =  SPECTRUM
NUMBER OF ELEMENT TYPES =      6
  8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
 12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
   690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
  1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
  1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
   269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
MAXIMUM LINEAR PROPERTY NUMBER        =      6
ACTIVE COORDINATE SYSTEM              =      0  (CARTESIAN)
NUMBER OF SPECIFIED CONSTRAINTS       =   1185

INITIAL JOBNAME = postlin3
CURRENT JOBNAME = postlin3

CURRENT JOBNAME REDEFINED AS seism3
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   09:32:28  APR 10, 1996 CP=      5.550
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


        ***** ANSYS RESULTS INTERPRETATION (POST1) *****


USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

*** NOTE ***                            CP=       7.130   TIME= 09:32:31
Page file used.

SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
  TIME/FREQUENCY=  57.505
TITLE=  21 PWR Tube Seismic Analysis With Backfill

/INPUT FILE= seism3.mcom  LINE=       0
ANSYS REVISION  5.1              24    23:26:16    04/09/1996
 seism3.mcom
```

```
CURRENT LOAD SET IN DATABASE IS ERASED

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.40396E-03

COPY LOAD CASE   1 FROM FILE TO DATABASE

SQUARE THE CURRENT LOAD SET IN DATABASE

*** NOTE ***                                CP=     30.960   TIME= 09:33:35
Load case combination data may not be correct unless viewed in the
 solution phase coordinate system (RSYS=SOLU).

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.18891E-01

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.18891E-01 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.18891E-01 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.65883E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.65883E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.65883E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.10506E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.10506E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.10506E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.81302E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.81302E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.81302E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.10809E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.10809E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.10809E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism3.rst
```

```
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.27262E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.27262E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.27262E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism3.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.57938E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.57938E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.57938E-03 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE
 Outer Barrier Stress Distribution
 Outer Barrier Linearized Stresses at Location of Peak Stress
 Inner Barrier Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE   12757 TO    12757 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12765 TO    12765 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12761 TO    12761 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     8 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
     12757 12761

/OUTPUT FILE= ibstress

/SHOW SWITCH PLOTS TO FILE ibdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE ibdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Basket Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    4388 TO     4388 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    4438 TO     4438 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    4310 TO     4310 STEP        1
```

```
     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT       ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     4 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      4388  4310

/OUTPUT FILE= bktstres

/SHOW SWITCH PLOTS TO FILE bktdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE bktdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Criticality Control Plate Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE     940 TO      940 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    1100 TO     1100 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    1064 TO     1064 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT       ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     8 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
       940  1064

/OUTPUT FILE= pltstres

/SHOW SWITCH PLOTS TO FILE pltdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE pltdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED *****  CP =       103.170


EXIT ANSYS WITHOUT SAVING DATABASE

NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0
```

```
***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        14517
MAXIMUM RECORD NUMBER    =          529
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)      =       33.063
```

```
*-------------------------------------------------------------------------*
|                                                                         |
|                          ANSYS RUN COMPLETED                            |
|                                                                         |
|-------------------------------------------------------------------------|
|                                                                         |
|              REV. 5.1   24                    HP 9000/7XX               |
|                                                                         |
|       CP TIME      (sec) =        103.190     TIME  =  09:36:49         |
|       ELAPSED TIME (sec) =        268.000     DATE  =  04/10/96         |
|                                                                         |
*-------------------------------------------------------------------------*
```

```
/COM,ANSYS REVISION  5.1              24    23:26:16    04/09/1996
/COM, seism3.mcom
LCOPER,ZERO
LCDEFI,1,     1,     1
LCFACT,1, -0.403962E-03
LCASE,1
LCOPER,SQUARE
LCDEFI,1,     1,     2
LCFACT,1,  0.188907E-01
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     3
LCFACT,1, -0.658825E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     4
LCFACT,1, -0.105063E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     5
LCFACT,1, -0.813019E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     6
LCFACT,1, -0.108087E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     7
LCFACT,1,  0.272623E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     8
LCFACT,1,  0.579377E-03
LCOPER,ADD,1,MULT,1
LCOPER,SQRT
```

```
*------------------------------------------------------------------*
|                                                                  |
|       W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = seism2
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.200   TIME= 20:36:05
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism2    20:36:05  APR 10, 1996 CP=      0.210

    1 /com,*********************************************************************
    2 /com,*********************************************************************
    3 /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4 /com,*****  Degree of Degradation in Outer Barrier: 100%                   *****
    5 /com,*****  Degree of Degradation in Inner Barrier:  90%                   *****
    6 /com,*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
    7 /com,*****                                             Guides 50%          *****
    8 /com,*****                                             SS-B Plates 0%      *****
    9 /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
   10 /com,*****  Quarter Symmetry Model                                         *****
   11 /com,*********************************************************************
   12 /com,*********************************************************************
   13 /com,*********************************************************************
   14 /config,nvpag,512
   15 /units,si
   16 /prep7
   17 /title, 21 PWR Tube Seismic Analysis With Backfill
   18 /vcon,,0
   19 /com, Define Parameters
   20 ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   21 obir=0.71295            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   22 obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   23 obor=0.78095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   24 ts1=.007                ! SS-B Plate Thickness
   25 ts2=.005                ! CS Tube Thickness
   26 ts3=.005                ! Corner Guide Thickness
   27 ts4=.005                ! End Guide Thickness
   28 egih=0.0855             ! End Guide Fin Inner Height(0.0809+0.005-2.5*tan10)
   29 pie=3.1415926           ! Pi
   30 ang1=30*pie/180         ! Angle on end of end guide
   31 ang2=80*pie/180         ! Angle on end of end guide fin
   32 ang3=58*pie/180         ! Angle on end of corner guide
   33 tw=0.2285               ! Tube Inner Side Width
   34 pos1=tw/2               ! Dimension to Keypoint Position 1
   35 pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   36 pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   37 pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   38 pos5=pos4+tw            ! Dimension to Keypoint Position 5
   39 pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   40 pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   41 pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   42 pos9=pos8+tw            ! Dimension to Keypoint Position 9
   43 pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   44 pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   45 posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   46 posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   47 poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   48 posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   49 posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   50 poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
```

```
poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
bkht=4.575/2                ! Basket Height (Half Height)
ibht=bkht+0.01               ! inner barrier cavity height
!bgh=ibht-bkht              ! Basket Gap Height
iblt=0.007                  ! inner lid height
elev1=ibht+iblt             ! Elevation of Top of Inner Barrier
ltlgh=0.030                 ! Lid to Lid Gap Height
elev2=elev1+ltlgh           ! Elevation of Bottom of Upper Outer Barrier Lid
oblt=0.06                   ! outer lid height
elev3=elev2+oblt            ! Elevation of Top of Upper Outer Barrier Lid
stht=0.225                  ! skirt height
elev4=elev3+stht            ! Elevation of Top of Waste Package
elev5=-(iblt+oblt)          ! Elevation of Bottom of Lower Outer Barrier Lid
elev6=elev5-stht            ! Elevation of Bottom of Waste Package
/com, Line Divisions
shd=1               ! Skirt Height Divisions
obld=1              ! Outer Barrier Lid Divisions
gd=2                ! Gap Divisions
ibld=2              ! Inner Barrier Lid Divisions
bd=15               ! Basket Divisions
htwd=4              ! Half Tube Width Divisions
twd=4               ! Tube Width Divisions
thd=4               ! Tube Height Divisions
egfd=4              ! End Guide Fin Divisions
ptd=2               ! Plate Thickness Divisions
ttd=1               ! Tube Thickness Divisions
a1d=4               ! Arc 1 Divisions
a2d=4               ! Arc 2 Divisions
a3d=4               ! Arc 3 Divisions
a4d=4               ! Arc 4 Divisions
a5d=4               ! Arc 5 Divisions
a6d=4               ! Arc 6 Divisions
a7d=4               ! Arc 7 Divisions
a8d=4               ! Arc 8 Divisions
a9d=4               ! Arc 9 Divisions
ibtd=2              ! Inner Barrier Thickness Divisions
obitd=2             ! Outer Barrier Inner Thickness Divisions
std=2               ! Skirt Thickness Divisions
/com, Define Element Properties
et,1,solid45        ! Carbon Steel Tube
et,2,solid45        ! Stainless Steel - Boron Plate
et,3,solid45        ! Carbon Steel End Guide
et,4,solid45        ! Carbon Steel Corner Guide
et,5,solid45        ! Alloy 625 Inner Barrier
et,6,solid45        ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!et,6,solid45       ! A 516 Carbon Steel Outer Barrier
!et,7,solid45       ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
/com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
/com, Room Temperature Properties of Materials
mp,ex,1,206e9       ! A516 Carbon Steel Tube
mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
mp,ex,3,206e9       ! A516 Carbon Steel End Guide
mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
mp,ex,5,208e9       ! Alloy 625 Inner Barrier
mp,ex,6,208e9       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!mp,ex,6,206e9      ! A516 Carbon Steel Outer Barrier
!mp,ex,7,206e9      ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
mp,nuxy,6,0.278     ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!mp,nuxy,6,0.3      ! A516 Carbon Steel Outer Barrier
!mp,nuxy,7,0.3      ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,dens,1,8131      ! A516 Carbon Steel Tube
mp,dens,2,89020.33  ! 316B6A Stainless Steel - Boron Plate (Adjusted to include tube and SNF masses)
mp,dens,3,16262     ! A516 Carbon Steel End Guide (Doubled for Corrosion Prod.)
mp,dens,4,16262     ! A516 Carbon Steel Corner Guide (Doubled for Corrosion)
mp,dens,5,8442      ! Alloy 625 Inner Barrier
```

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121 mp,dens,6,1101960    ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
122 !mp,dens,6,8131      ! A516 Carbon Steel Outer Barrier
123 !mp,mu,7,0.57        ! Coefficient of Friction (Steel on Steel Assumed)
124 !tb,biso,1
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
126 !tb,biso,2
127 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
128 !tb,biso,3
129 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
130 !tb,biso,4
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
132 !tb,biso,5
133 !tbdata,,379e6,1.271e9  ! Alloy 625
134 !tb,biso,6
135 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
136 !tb,biso,7
137 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
138 /com
139 /com, Define keypoints in the basket assembly
140 csys,0
141 k,1,0,0
142 k,2,pos1,0
143 k,3,pos2,0
144 k,4,pos3,0
145 k,5,pos4,0
146 k,6,pos5,0
147 k,7,pos6,0
148 k,8,pos7,0
149 k,9,pos8,0
150 k,10,pos9,0
151 k,11,pos10,0
152 k,12,pos11,0
153 k,13,pos1,pos1
154 k,14,pos4,pos1
155 k,15,pos5,pos1
156 k,16,pos8,pos1
157 k,17,pos9,pos1
158 k,18,pos2,pos2
159 k,19,pos3,pos2
160 k,20,pos6,pos2
161 k,21,pos7,pos2
162 k,22,pos10,pos2
163 k,23,pos11,posen
164 !k,24,posei,posen
165 csys,1
166 k,24,ibir,(180/pie)*atan(posen/posei)
167 csys,0
168 k,25,pos3,pos3
169 k,26,pos6,pos3
170 k,27,pos7,pos3
171 k,28,pos10,pos3
172 k,29,pos11,posef
173 !k,30,poseo,posef
174 csys,1
175 k,30,ibir,(180/pie)*atan(posef/poseo)
176 csys,0
177 k,31,pos4,pos4
178 k,32,pos5,pos4
179 k,33,pos8,pos4
180 k,34,pos9,pos4
181 k,35,pos5,pos5
182 k,36,pos8,pos5
183 k,37,pos9,pos5
184 !k,38,pos11,poseg
185 csys,1
186 k,38,ibir,(180/pie)*atan(poseg/pos11)
187 csys,0
188 k,39,pos6,pos6
189 k,40,pos7,pos6
190 !k,41,pos10,pos6
```

```
csys,1
k,41,ibir,(180/pie)*atan(pos6/pos10)
csys,0
k,42,posg,posg
!k,43,poscg,posg
csys,1
k,43,ibir,(180/pie)*atan(posg/poscg)
k,44,ibir,0
k,45,ibir,45
k,46,obir,0
k,47,obir,(180/pie)*atan(posen/posei)
k,48,obir,(180/pie)*atan(posef/poseo)
k,49,obir,(180/pie)*atan(poseg/pos11)
k,50,obir,(180/pie)*atan(pos6/pos10)
k,51,obir,(180/pie)*atan(posg/poscg)
k,52,obir,45
k,53,obsr,0
k,54,obsr,(180/pie)*atan(posen/posei)
k,55,obsr,(180/pie)*atan(posef/poseo)
k,56,obsr,(180/pie)*atan(poseg/pos11)
k,57,obsr,(180/pie)*atan(pos6/pos10)
k,58,obsr,(180/pie)*atan(posg/poscg)
k,59,obsr,45
k,60,obor,0
k,61,obor,(180/pie)*atan(posen/posei)
k,62,obor,(180/pie)*atan(posef/poseo)
k,63,obor,(180/pie)*atan(poseg/pos11)
k,64,obor,(180/pie)*atan(pos6/pos10)
k,65,obor,(180/pie)*atan(posg/poscg)
k,66,obor,45
local,11,0,0,0,0,45,0,0,
ksymm,y,all,,,0,0,0
nummrg,kp
csys,0
ksymm,y,all,,,0,0,0
nummrg,kp
kdel,2,12,1
k,1001,0,0,bkht
l,1,1001              ! Line 1 for VDRAG of Basket
lesize,all,,,bd,.2,0
k,2001,0,0,ibht
l,1001,2001           ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
lesize,all,,,gd,1,0
k,3001,0,0,elev1
l,2001,3001           ! Line 3 for VDRAG of Inner Barrier Upper Lid
lesize,all,,,ibld,1,0
k,4001,0,0,elev2
l,3001,4001           ! Line 4 for VDRAG of Lid to Lid Gap
lesize,all,,,gd,1,0
k,5001,0,0,elev3
l,4001,5001           ! Line 5 for VDRAG of Outer Barrier Upper Lid
lesize,all,,,obld,1,0
k,6001,0,0,elev4
l,5001,6001           ! Line 6 for VDRAG of Upper Skirt
lesize,all,,,shd,1,0
k,7001,0,0,-iblt
l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
lesize,all,,,ibld,1,0
k,8001,0,0,elev5
l,7001,8001           ! Line 8 for VDRAG of OB Lower Lid
lesize,all,,,obld,1,0
k,9001,0,0,elev6
l,8001,9001           ! Line 9 for VDRAG of Lower Skirt
lesize,all,,,shd,1,0
/com, line set 1 Tube Width for Half Tubes on Symmetry Plane
L,      197,      206  ! Line 10
L,      196,      205
L,      195,      201
L,      194,      200
L,      193,      204
```

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 261  L,      192,      203
 262  L,      191,      199
 263  L,      190,      198
 264  L,      189,      202
 265  L,      188,      138
 266  L,      187,      133  ! 20
 267  L,       68,       13
 268  L,       69,       18
 269  L,       70,       85
 270  L,       71,       80
 271  L,       72,       81
 272  L,       73,       86
 273  L,       74,       87
 274  L,       75,       82
 275  L,       76,       83
 276  L,       77,       88  ! 30
 277  L,       78,       89
 278  lesize,all,,,htwd,1,0
 279  /com, line set 2 Tube Widths
 280  L,      211,      218
 281  L,      210,      220
 282  L,      215,      217
 283  L,      214,      216
 284  L,      209,      219
 285  L,      208,      159
 286  L,      213,      155
 287  L,      151,      152
 288  L,      145,      146  ! 40
 289  L,      139,      140
 290  L,      134,      135
 291  L,       14,       15
 292  L,       19,       20
 293  L,       25,       26
 294  L,       31,       32
 295  L,       98,       35
 296  L,       92,       39
 297  L,       93,      106
 298  L,       99,      102  ! 50
 299  L,      100,      103
 300  L,       94,      107
 301  L,       95,      104
 302  lesize,all,,,twd,1,0
 303  /com, line set 3 Tube Widths on End Column
 304  L,      162,      163
 305  L,      160,      161
 306  L,      156,      157
 307  L,      153,      154
 308  L,      147,      148
 309  L,      141,      142
 310  L,      136,      137  ! 60
 311  L,       16,       17
 312  L,       21,       22
 313  L,       27,       28
 314  L,       33,       34
 315  L,       36,       37
 316  L,       40,       41
 317  L,       42,       43
 318  lesize,all,,,twd,1,0
 319  /com, line set 4 Tube Heights
 320  L,      201,      200
 321  L,      205,      204
 322  L,      210,      209  ! 70
 323  L,      215,      214
 324  L,      217,      216
 325  L,      220,      219
 326  L,      221,      162
 327  L,      199,      198
 328  L,      203,      202
 329  L,      208,      145
 330  L,      213,      151
```

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 331  L,     155,     152
 332  L,     159,     146  ! 80
 333  L,     160,     147
 334  L,     156,     153
 335  L,     157,     154
 336  L,     161,     148
 337  L,     133,      13
 338  L,     138,      18
 339  L,     139,      19
 340  L,     134,      14
 341  L,     135,      15
 342  L,     140,      20  ! 90
 343  L,     141,      21
 344  L,     136,      16
 345  L,     137,      17
 346  L,     142,      22
 347  L,     143,      23
 348  L,      80,      81
 349  L,      85,      86
 350  L,      25,      92
 351  L,      31,      98
 352  L,      32,      35  ! 100
 353  L,      26,      39
 354  L,      27,      40
 355  L,      33,      36
 356  L,      34,      37
 357  L,      28,      41
 358  L,      29,      38
 359  L,      82,      83
 360  L,      87,      88
 361  L,      93,      94
 362  L,      99,     100  ! 110
 363  L,     102,     103
 364  L,     106,     107
 365  L,      42,     109
 366  L,     158,     149
 367  lesize,all,,,thd,1,0
 368  /com, line set 5 End Guide Fins
 369  L,     207,     206
 370  L,     212,     211
 371  L,     150,     149
 372  L,     144,     143
 373  L,      24,      23
 374  L,      30,      29  ! 120
 375  L,      96,      95
 376  L,      90,      89
 377  lesize,all,,,egfd,1,0
 378  /com, line set 6 SS-B Plate Thickness
 379  L,     197,     196
 380  L,     206,     205
 381  L,     211,     210
 382  L,     207,     212
 383  L,     206,     211
 384  L,     205,     210
 385  L,     218,     220
 386  L,     220,     221  ! 130
 387  L,     193,     192
 388  L,     204,     203
 389  L,     209,     208
 390  L,     204,     209
 391  L,     203,     208
 392  L,     219,     159
 393  L,     162,     160
 394  L,     163,     161
 395  L,     161,     158
 396  L,     219,     162  ! 140
 397  L,     159,     160
 398  L,     189,     188
 399  L,     202,     138
 400  L,     145,     139
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401  L,     202,     145
402  L,     138,     139
403  L,     146,     140
404  L,     147,     141
405  L,     146,     147
406  L,     140,     141  ! 150
407  L,     148,     142
408  L,     149,     143
409  L,     148,     149
410  L,     142,     143
411  L,     150,     144
412  L,      69,      70
413  L,      18,      85
414  L,      19,      25
415  L,      18,      19
416  L,      85,      25  ! 160
417  L,      20,      26
418  L,      21,      27
419  L,      20,      21
420  L,      26,      27
421  L,      22,      28
422  L,      22,      23
423  L,      28,      29
424  L,      23,      29
425  L,      24,      30
426  L,      73,      74  ! 170
427  L,      86,      87
428  L,      92,      93
429  L,      86,      92
430  L,      87,      93
431  L,      39,     106
432  L,      40,      42
433  L,      39,      40
434  L,     106,      42
435  L,      38,      41
436  L,      41,      43  ! 180
437  L,      77,      78
438  L,      88,      89
439  L,      94,      95
440  L,      88,      94
441  L,      89,      95
442  L,      90,      96
443  L,     109,     107
444  L,     107,     104
445  L,     224,     225
446  L,     230,     231  ! 190
447  L,     236,     237
448  L,     226,     227
449  L,     227,     228
450  L,     232,     233
451  L,     233,     234
452  L,     238,     239
453  L,     239,     240
454  L,     171,     170
455  L,     170,     169
456  L,     178,     177  ! 200
457  L,     177,     176
458  L,     185,     184
459  L,     184,     183
460  L,     168,     167
461  L,     175,     174
462  L,     182,     181
463  L,      47,      48
464  L,      54,      55
465  L,      61,      62
466  L,      49,      50  ! 210
467  L,      50,      51
468  L,      56,      57
469  L,      57,      58
470  L,      63,      64
```

```
 471  L,      64,      65
 472  L,     117,     116
 473  L,     116,     115
 474  L,     124,     123
 475  L,     123,     122
 476  L,     131,     130  ! 220
 477  L,     130,     129
 478  L,     114,     113
 479  L,     121,     120
 480  L,     128,     127
 481  lesize,all,,,ptd,1,0
 482  /com, line set 7 tube thickness
 483  L,     196,     195
 484  L,     205,     201
 485  L,     204,     200
 486  L,     193,     194
 487  L,     210,     215
 488  L,     220,     217  ! 230
 489  L,     219,     216
 490  L,     209,     214
 491  L,     192,     191
 492  L,     203,     199
 493  L,     202,     198
 494  L,     189,     190
 495  L,     208,     213
 496  L,     159,     155
 497  L,     146,     152
 498  L,     145,     151  ! 240
 499  L,     160,     156
 500  L,     161,     157
 501  L,     148,     154
 502  L,     147,     153
 503  L,     188,     187
 504  L,     138,     133
 505  L,      18,      13
 506  L,      69,      68
 507  L,     139,     134
 508  L,     140,     135  ! 250
 509  L,      20,      15
 510  L,      19,      14
 511  L,     141,     136
 512  L,     142,     137
 513  L,      22,      17
 514  L,      21,      16
 515  L,      70,      71
 516  L,      85,      80
 517  L,      86,      81
 518  L,      73,      72  ! 260
 519  L,      25,      31
 520  L,      26,      32
 521  L,      39,      35
 522  L,      92,      98
 523  L,      27,      33
 524  L,      28,      34
 525  L,      41,      37
 526  L,      40,      36
 527  L,      74,      75
 528  L,      87,      82  ! 270
 529  L,      88,      83
 530  L,      77,      76
 531  L,      93,      99
 532  L,     106,     102
 533  L,     107,     103
 534  L,      94,     100
 535  lesize,all,,,ttd,1,0
 536  csys,1
 537  /com, line set 8, arc 1 bottom
 538  L,     222,     207
 539  L,     223,     224
 540  L,     229,     230
```

```
L,     235,     236  ! 280
lesize,all,,,a1d,1,0
/com, line set 9, arc 2 side arcs
L,     212,     218
L,     225,     226
L,     231,     232
L,     237,     238
lesize,all,,,a2d,1,0
/com, line set 10, arc 3 side arcs
L,     221,     163
L,     228,     171
L,     234,     178
L,     240,     185
lesize,all,,,a3d,1,0
/com, line set 11, arc 4 side arcs
L,     158,     150
L,     169,     168  ! 290
L,     176,     175
L,     183,     182
lesize,all,,,a4d,1,0
/com, line set 12, arc 5 side arcs
L,     144,      24
L,     167,      47
L,     174,      54
L,     181,      61
lesize,all,,,a5d,1,0
/com, line set 13, arc 6 side arcs
L,      30,      38
L,      48,      49
L,      55,      56
L,      62,      63  ! 300
lesize,all,,,a6d,1,0
/com, line set 14, arc 7 side arcs
L,      43,     109
L,      51,     117
L,      58,     124
L,      65,     131
lesize,all,,,a7d,1,0
/com, line set 15, arc 8 side arcs
L,     104,      96
L,     115,     114
L,     122,     121
L,     129,     128
lesize,all,,,a8d,1,0
/com, line set 16, arc 9 top arcs
L,      90,     110
L,     113,     112  ! 310
L,     120,     119
L,     127,     126
lesize,all,,,a9d,1,0
csys,0
/com, line set 17 IB thickness
L,     222,     223
L,     207,     224
L,     212,     225
L,     218,     226
L,     220,     227
L,     221,     228
L,     163,     171
L,     161,     170  ! 320
L,     158,     169
L,     150,     168
L,     144,     167
L,      24,      47
L,      30,      48
L,      38,      49
L,      41,      50
L,      43,      51
L,     109,     117
L,     107,     116  ! 330
```

```
611  L,      104,      115
612  L,       96,      114
613  L,       90,      113
614  L,      110,      112
615  lesize,all,,,ibtd,1,0
616  /com, line set 18 OB inner thickness
617  L,      223,      229
618  L,      224,      230
619  L,      225,      231
620  L,      226,      232
621  L,      227,      233
622  L,      228,      234  ! 340
623  L,      171,      178
624  L,      170,      177
625  L,      169,      176
626  L,      168,      175
627  L,      167,      174
628  L,       47,       54
629  L,       48,       55
630  L,       49,       56
631  L,       50,       57
632  L,       51,       58  ! 350
633  L,      117,      124
634  L,      116,      123
635  L,      115,      122
636  L,      114,      121
637  L,      113,      120
638  L,      112,      119
639  lesize,all,,,obitd,1,0
640  /com, line set 19 skirt thickness
641  L,      229,      235
642  L,      230,      236
643  L,      231,      237
644  L,      232,      238  ! 360
645  L,      233,      239
646  L,      234,      240
647  L,      178,      185
648  L,      177,      184
649  L,      176,      183
650  L,      175,      182
651  L,      174,      181
652  L,       54,       61
653  L,       55,       62
654  L,       56,       63  ! 370
655  L,       57,       64
656  L,       58,       65
657  L,      124,      131
658  L,      123,      130
659  L,      122,      129
660  L,      121,      128
661  L,      120,      127
662  L,      119,      126
663  lesize,all,,,std,1,0
664  /com, lines to fill in lids
665  /com, lines tube height
666  l,195,194             ! 379
667  l,191,190             ! 380
668  l,187,68              ! 381
669  l,71,72               ! 382
670  l,75,76               ! 383
671  lesize,all,,,thd,1,0
672  /com, end lines
673  l,222,197             ! 384
674  l,78,110              ! 385
675  lesize,all,,,egfd,1,0
676  /com, area set 1, tubes
677  a,195,196,205,201
678  a,200,201,205,204
679  a,193,194,200,204
680  a,191,192,203,199
```

```
a,198,199,203,202
a,189,190,198,202
a,187,188,138,133
a,133,138,18,13
a,69,68,13,18
a,71,70,85,80
a,80,85,86,81
a,73,72,81,86
a,75,74,87,82
a,82,87,88,83
a,77,76,83,88
a,209,210,215,214
a,215,210,220,217
a,216,217,220,219
a,209,214,216,219
a,145,208,213,151
a,213,208,159,155
a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
```

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a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
a,159,219,162,160
a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
!a,223,229,230,224
!a,224,230,231,225
!a,225,231,232,226
!a,226,232,233,227
!a,227,233,234,228
!a,228,234,178,171
!a,171,178,177,170
!a,170,177,176,169
!a,169,176,175,168
!a,168,175,174,167
!a,167,174,54,47
!a,47,54,55,48
!a,48,55,56,49
!a,49,56,57,50
!a,50,57,58,51
!a,51,58,124,117
!a,117,124,123,116
!a,116,123,122,115
!a,115,122,121,114
!a,114,121,120,113
!a,113,120,119,112
!a,229,235,236,230
!a,236,237,231,230
!a,231,237,238,232
!a,238,239,233,232
```

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!a,239,240,234,233
!a,240,185,178,234
!a,185,184,177,178
!a,184,183,176,177
!a,176,183,182,175
!a,175,182,181,174
!a,174,181,61,54
!a,54,61,62,55
!a,55,62,63,56
!a,56,63,64,57
!a,57,64,65,58
!a,58,65,131,124
!a,124,131,130,123
!a,123,130,129,122
!a,122,129,128,121
!a,121,128,127,120
!a,120,127,126,119
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.01
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,0.01
nummrg,kp
/com, generate lines to fill in Lid at top of WP
/com, lines tube height
L,414,421  ! 1121
L,422,429  ! 1124
L,430,437  ! 1125
L,438,445  ! 1131
L,446,453  ! 1138
lesize,all,,,thd,1,0
/com, end lines
L,370,518  ! 1141
L,539,413  ! 1151
lesize,all,,,egfd,1,0
al,832,1116,1120,1141
al,936,937,941,1121
al,946,947,951,1124
al,956,959,961,1125
al,966,969,971,1131
al,976,979,981,1138
al,932,1143,1147,1151
al,842,1122,1123
al,985,989,990,993
al,997,1001,1002,1005
al,1010,1013,1015,1018
al,1021,1025,1028,1029
al,1033,1037,1040,1041
al,922,1144,1148
al,857,1153,1156
al,1046,1049,1051,1054
al,1058,1061,1063,1066
al,1070,1073,1075,1078
al,907,1159,1163
al,872,1126,1130
al,882,1132,1133,1137
al,892,1139,1140
asel,s,loc,z,ibht+0.01
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
!asel,s,loc,z,elev1+0.015
!csys,1
!asel,r,loc,x,obir,obor
```

```
!csys,0
!vdrag,all,,,,,4          ! Drag Lid to Lid Gap
!asel,s,loc,z,elev1+0.015
!asel,r,loc,z,elev1-0.015
!csys,1
!asel,r,loc,x,0,obir
!csys,0
!agen,2,all,,,,,ltlgh
!nummrg,kp
!asel,s,loc,z,elev2+0.015
!vdrag,all,,,,,5          ! Drag Outer Barrier Upper Lid
!asel,s,loc,z,elev3
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,6          ! Drag Upper Skirt
/com, lines at bottom lid used to be here
!al,10,115,277,384
!al,12,13,68,379
!al,16,17,75,380
!al,20,21,85,381
!al,24,25,96,382
!al,28,29,107,383
!al,31,122,309,385
!al,32,116,281
!al,34,35,71,72
!al,38,39,78,79
!al,42,43,88,89
!al,46,47,99,100
!al,50,51,110,111
!al,53,121,305
!al,54,74,285
!al,56,57,82,83
!al,60,61,92,93
!al,64,65,103,104
!al,67,113,301
!al,114,117,289
!al,95,118,119,293
!al,106,120,297
!asel,s,loc,z,0
!vdrag,all,,,,,7          ! Drag Inner Barrier Lower Lid
!csys,0
!asel,s,loc,z,-iblt
!vdrag,all,,,,,8          ! Drag Outer Barrier Lower Lid
!asel,s,loc,z,elev5
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
!vsel,s,volu,,1,47
!type,1
!mat,1
!vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
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```
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,0,elev1
csys,1
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
vsel,u,loc,x,ibir-0.02,obir
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,loc,x,obir,obor
vsel,r,loc,z,-iblt,elev1
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Upper Inner Barrier Acding Backfill Mass
vsel,inve
csys,1
vsel,u,loc,x,obir,obor
vsel,r,loc,z,0,elev1
vsel,u,volu,,1,92
csys,0
type,6
mat,6
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
!vsel,inve
!vsel,u,volu,,1,92
!csys,1
!vsel,u,loc,x,obir,obor
!vsel,a,loc,y,-90,5
!vsel,u,volu,,1,92
!vsel,u,type,,5
!type,6
!mat,6
!vmesh,all
/com, mesh upper outer barrier adding backfill mass
!vsel,inve
!vsel,u,type,,1,5
!type,7
!mat,7
!vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
nsel,s,loc,z,0
dsym,symm,z,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(7*bkht/bd),(10*bkht/bd)+0.02
nsel,r,loc,x,obir-0.001,obir+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini
```

```
 1031
 1032  /sol
 1033  expass,on
 1034  mxpand,8,,,yes
 1035  solve
 1036  fini
 1037
 1038  /sol
 1039  antype,spectr
 1040  spopt,sprs,,on
 1041  sed,,1
 1042  svtyp,2
 1043  freq,0.1,100
 1044  sv,,16.285,16.285
 1045  mcomb,srss,1e-8
 1046  outres,all,1
 1047  save
 1048  solve
 1049  fini
 1050  /exit
 1051  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/cocu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,
```

```
 ABBREVIATION= R0        /pnum,real,0,

 ABBREVIATION= T1        /pnum,type,1,

 ABBREVIATION= T0        /pnum,type,0,

 ABBREVIATION= C1        /number,1,

 ABBREVIATION= C0        /number,0,

 ABBREVIATION= PR1       /psf,pres,norm,1,

 ABBREVIATION= PR0       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************
 ********************************************************************************
 ********************************************************************************
 *****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
 *****  Degree of Degradation in Outer Barrier: 100%                   *****
 *****  Degree of Degradation in Inner Barrier:  90%                   *****
 *****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
 *****                                             Guides 50%          *****
 *****                                             SS-B Plates 0%      *****
 *****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
 *****  Quarter Symmetry Model                                         *****
 ********************************************************************************
 ********************************************************************************
 ********************************************************************************

 NUMBER OF DATA BASE PAGES IN MEMORY     (NVPAGE)=       512

 SI UNITS SPECIFIED FOR INTERNAL
  LENGTH        (l)  = METER(M)
  MASS          (M)  = KILOGRAM(KG)
  TIME          (t)  = SECOND(SEC)
  TEMPERATURE   (T)  = KELVIN(K)
  TOFFSET            = 0.0 KELVIN
  CHARGE        (Q)  = COULOMB
  CURRENT       (i)  = AMPERE (COULOMBS/SEC)
  FORCE         (f)  = NEWTON(N) (KG-M/SEC2)
  PRESSURE           = PASCAL (NEWTON/M**2)
  ENERGY        (W)  = JOULE (N-M)
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 POWER          (P)  = WATT (N-M/SEC)
 CAPACITANCE    (C)  = FARAD
 INDUCTANCE     (L)  = HENRY
 MAGNETIC FLUX       = WEBER
 RESISTANCE     (R)  = OHM
 ELECTRIC POTENTIAL = VOLT

 INPUT UNITS ARE ALSO SET TO SI
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   20:36:05  APR 10, 1996 CP=      0.440
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844



        ***** ANSYS ANALYSIS DEFINITION (PREP7) *****

TITLE=
 21 PWR Tube Seismic Analysis With Backfill


VIEW CONE ANGLE FOR WINDOW  1    0.00
 Define Parameters

PARAMETER IBIR     =    0.7109500

PARAMETER OBIR     =    0.7129500

PARAMETER OBSR     =    0.7709500

PARAMETER OBOR     =    0.7809500

PARAMETER TS1      =    0.7000000E-02

PARAMETER TS2      =    0.5000000E-02

PARAMETER TS3      =    0.5000000E-02

PARAMETER TS4      =    0.5000000E-02

PARAMETER EGIH     =    0.8550000E-01

PARAMETER PIE      =     3.141593

PARAMETER ANG1     =    0.5235988

PARAMETER ANG2     =     1.396263

PARAMETER ANG3     =     1.012291

PARAMETER TW       =    0.2285000

PARAMETER POS1     =    0.1142500

PARAMETER POS2     =    0.1192500

PARAMETER POS3     =    0.1262500

PARAMETER POS4     =    0.1312500

PARAMETER POS5     =    0.3597500

PARAMETER POS6     =    0.3647500

PARAMETER POS7     =    0.3717500

PARAMETER POS8     =    0.3767500
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PARAMETER POS9 = 0.6052500

PARAMETER POS10 = 0.6102500

PARAMETER POS11 = 0.6152500

PARAMETER POSG = 0.3697500

PARAMETER POSEI = 0.7007500

PARAMETER POSEO = 0.6998684

PARAMETER POSEN = 0.1202500

PARAMETER POSEF = 0.1252500

PARAMETER POSEG = 0.3560897

PARAMETER POSCG = 0.6071257

PARAMETER BKHT = 2.287500

PARAMETER IBHT = 2.297500

PARAMETER IBLT = 0.7000000E-02

PARAMETER ELEV1 = 2.304500

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 2.334500

PARAMETER OBLT = 0.6000000E-01

PARAMETER ELEV3 = 2.394500

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 2.619500

PARAMETER ELEV5 = -0.6700000E-01

PARAMETER ELEV6 = -0.2920000
Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 2.000000

PARAMETER IBLD = 2.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 2.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

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 PARAMETER A3D       =      4.000000

 PARAMETER A4D       =      4.000000

 PARAMETER A5D       =      4.000000

 PARAMETER A6D       =      4.000000

 PARAMETER A7D       =      4.000000

 PARAMETER A8D       =      4.000000

 PARAMETER A9D       =      4.000000

 PARAMETER IBTD      =      2.000000

 PARAMETER OBITD     =      2.000000

 PARAMETER STD       =      2.000000
  Define Element Properties

 ELEMENT TYPE     1 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     2 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     3 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     4 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     5 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     6 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL
  ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
  Room Temperature Properties of Materials

 MATERIAL    1          EX   =   0.2060000E+12

 MATERIAL    2          EX   =   0.1950000E+12

 MATERIAL    3          EX   =   0.2060000E+12

 MATERIAL    4          EX   =   0.2060000E+12

 MATERIAL    5          EX   =   0.2080000E+12
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```
MATERIAL    6          EX   =   0.2080000E+12
MATERIAL    1          NUXY =   0.3000000
MATERIAL    2          NUXY =   0.2980000
MATERIAL    3          NUXY =   0.3000000
MATERIAL    4          NUXY =   0.3000000
MATERIAL    5          NUXY =   0.2780000
MATERIAL    6          NUXY =   0.2780000
MATERIAL    1          DENS =    8131.000
MATERIAL    2          DENS =    89020.33
MATERIAL    3          DENS =    16262.00
MATERIAL    4          DENS =    16262.00
MATERIAL    5          DENS =    8442.000
MATERIAL    6          DENS =    1101960.
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1   X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2   X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3   X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4   X,Y,Z=  0.126250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5   X,Y,Z=  0.131250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6   X,Y,Z=  0.359750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7   X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8   X,Y,Z=  0.371750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9   X,Y,Z=  0.376750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10   X,Y,Z=  0.605250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11   X,Y,Z=  0.610250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12   X,Y,Z=  0.615250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13   X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14   X,Y,Z=  0.131250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15   X,Y,Z=  0.359750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16   X,Y,Z=  0.376750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17   X,Y,Z=  0.605250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18   X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19   X,Y,Z=  0.126250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20   X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
```

```
KEYPOINT     21   X,Y,Z=  0.371750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     22   X,Y,Z=  0.610250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     23   X,Y,Z=  0.615250      0.120250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     24   X,Y,Z=  0.710950       9.73722      0.000000E+00  IN CSYS=  1
                         0.700708      0.120243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     25   X,Y,Z=  0.126250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     26   X,Y,Z=  0.364750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     27   X,Y,Z=  0.371750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     28   X,Y,Z=  0.610250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     29   X,Y,Z=  0.615250      0.125250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     30   X,Y,Z=  0.710950       10.1464      0.000000E+00  IN CSYS=  1
                         0.699831      0.125243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     31   X,Y,Z=  0.131250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     32   X,Y,Z=  0.359750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     33   X,Y,Z=  0.376750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     34   X,Y,Z=  0.605250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     35   X,Y,Z=  0.359750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     36   X,Y,Z=  0.376750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     37   X,Y,Z=  0.605250      0.359750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     38   X,Y,Z=  0.710950       30.0611      0.000000E+00  IN CSYS=  1
                         0.615321      0.356131      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     39   X,Y,Z=  0.364750      0.364750      0.000000E+00  IN CSYS=  0
KEYPOINT     40   X,Y,Z=  0.371750      0.364750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     41   X,Y,Z=  0.710950       30.8670      0.000000E+00  IN CSYS=  1
                         0.610251      0.364751      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     42   X,Y,Z=  0.369750      0.369750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

KEYPOINT 43 X,Y,Z= 0.710950 31.3421 0.000000E+00 IN CSYS= 1
0.607206 0.369799 0.000000E+00 IN CSYS= 0
KEYPOINT 44 X,Y,Z= 0.710950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.710950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0
KEYPOINT 46 X,Y,Z= 0.712950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.712950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 47 X,Y,Z= 0.712950 9.73722 0.000000E+00 IN CSYS= 1
0.702679 0.120581 0.000000E+00 IN CSYS= 0
KEYPOINT 48 X,Y,Z= 0.712950 10.1464 0.000000E+00 IN CSYS= 1
0.701800 0.125596 0.000000E+00 IN CSYS= 0
KEYPOINT 49 X,Y,Z= 0.712950 30.0611 0.000000E+00 IN CSYS= 1
0.617052 0.357133 0.000000E+00 IN CSYS= 0
KEYPOINT 50 X,Y,Z= 0.712950 30.8670 0.000000E+00 IN CSYS= 1
0.611968 0.365777 0.000000E+00 IN CSYS= 0
KEYPOINT 51 X,Y,Z= 0.712950 31.3421 0.000000E+00 IN CSYS= 1
0.608914 0.370839 0.000000E+00 IN CSYS= 0
KEYPOINT 52 X,Y,Z= 0.712950 45.0000 0.000000E+00 IN CSYS= 1
0.504132 0.504132 0.000000E+00 IN CSYS= 0
KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 54 X,Y,Z= 0.770950 9.73722 0.000000E+00 IN CSYS= 1
0.759844 0.130391 0.000000E+00 IN CSYS= 0
KEYPOINT 55 X,Y,Z= 0.770950 10.1464 0.000000E+00 IN CSYS= 1
0.758893 0.135813 0.000000E+00 IN CSYS= 0
KEYPOINT 56 X,Y,Z= 0.770950 30.0611 0.000000E+00 IN CSYS= 1
0.667251 0.386186 0.000000E+00 IN CSYS= 0
KEYPOINT 57 X,Y,Z= 0.770950 30.8670 0.000000E+00 IN CSYS= 1
0.661753 0.395534 0.000000E+00 IN CSYS= 0
KEYPOINT 58 X,Y,Z= 0.770950 31.3421 0.000000E+00 IN CSYS= 1
0.658450 0.401008 0.000000E+00 IN CSYS= 0
KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0
KEYPOINT 60 X,Y,Z= 0.780950 0.000000E+00 0.000000E+00 IN CSYS= 1

```
                      0.780950      0.000000E+00  0.000000E+00  IN CSYS=  0

 KEYPOINT     61   X,Y,Z=  0.780950       9.73722       0.000000E+00  IN CSYS=  1

                      0.769699      0.132082      0.000000E+00  IN CSYS=  0

 KEYPOINT     62   X,Y,Z=  0.780950       10.1464       0.000000E+00  IN CSYS=  1

                      0.768737      0.137575      0.000000E+00  IN CSYS=  0

 KEYPOINT     63   X,Y,Z=  0.780950       30.0611       0.000000E+00  IN CSYS=  1

                      0.675906      0.391196      0.000000E+00  IN CSYS=  0

 KEYPOINT     64   X,Y,Z=  0.780950       30.8670       0.000000E+00  IN CSYS=  1

                      0.670337      0.400664      0.000000E+00  IN CSYS=  0

 KEYPOINT     65   X,Y,Z=  0.780950       31.3421       0.000000E+00  IN CSYS=  1

                      0.666991      0.406209      0.000000E+00  IN CSYS=  0

 KEYPOINT     66   X,Y,Z=  0.780950       45.0000       0.000000E+00  IN CSYS=  1

                      0.552215      0.552215      0.000000E+00  IN CSYS=  0

 COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
   XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
   ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
   ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

 ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

 SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
   SET IS ALL SELECTED KEYPOINTS

 MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
 KEYPOINT      1 USED FOR KEYPOINT(S)      67
 KEYPOINT     13 USED FOR KEYPOINT(S)      79
 KEYPOINT     18 USED FOR KEYPOINT(S)      84
 KEYPOINT     25 USED FOR KEYPOINT(S)      91
 KEYPOINT     31 USED FOR KEYPOINT(S)      97
 KEYPOINT     35 USED FOR KEYPOINT(S)     101
 KEYPOINT     39 USED FOR KEYPOINT(S)     105
 KEYPOINT     42 USED FOR KEYPOINT(S)     108
 KEYPOINT     45 USED FOR KEYPOINT(S)     111
 KEYPOINT     52 USED FOR KEYPOINT(S)     118
 KEYPOINT     59 USED FOR KEYPOINT(S)     125
 KEYPOINT     66 USED FOR KEYPOINT(S)     132

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
   SET IS ALL SELECTED KEYPOINTS

 MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
 KEYPOINT      1 USED FOR KEYPOINT(S)      67
 KEYPOINT      2 USED FOR KEYPOINT(S)      79
 KEYPOINT      3 USED FOR KEYPOINT(S)      84
 KEYPOINT      4 USED FOR KEYPOINT(S)      91
 KEYPOINT      5 USED FOR KEYPOINT(S)      97
 KEYPOINT      6 USED FOR KEYPOINT(S)     101
 KEYPOINT      7 USED FOR KEYPOINT(S)     105
 KEYPOINT      8 USED FOR KEYPOINT(S)     108
 KEYPOINT      9 USED FOR KEYPOINT(S)     111
 KEYPOINT     10 USED FOR KEYPOINT(S)     118
 KEYPOINT     11 USED FOR KEYPOINT(S)     125
 KEYPOINT     12 USED FOR KEYPOINT(S)     132
 KEYPOINT     44 USED FOR KEYPOINT(S)     164
 KEYPOINT     46 USED FOR KEYPOINT(S)     166
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 KEYPOINT     53 USED FOR KEYPOINT(S)     173
 KEYPOINT     60 USED FOR KEYPOINT(S)     180

 DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

 KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   2.28750      IN CSYS=  0

 LINE CONNECTS KEYPOINTS       1  1001
  LINE NO.=      1  KP1=       1  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    1001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    15,  SPACING RATIO =    0.200

 KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   2.29750      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    1001  2001
  LINE NO.=      2  KP1=    1001  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    2001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000

 KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   2.30450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    2001  3001
  LINE NO.=      3  KP1=    2001  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    3001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000

 KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   2.33450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    3001  4001
  LINE NO.=      4  KP1=    3001  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    4001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000

 KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   2.39450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    4001  5001
  LINE NO.=      5  KP1=    4001  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    5001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     1,  SPACING RATIO =    1.000

 KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   2.61950      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    5001  6001
  LINE NO.=      6  KP1=    5001  TAN1=    0.0000   0.0000  -1.0000
                    KP2=    6001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     1,  SPACING RATIO =    1.000

 KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.700000E-02  IN CSYS=  0

 LINE CONNECTS KEYPOINTS       1  7001
  LINE NO.=      7  KP1=       1  TAN1=    0.0000   0.0000   1.0000
                    KP2=    7001  TAN2=    0.0000   0.0000  -1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000

 KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.670000E-01  IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.292000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
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 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     72    81
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     81  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=    26  KP1=     73  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     86  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=    27  KP1=     74  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     87  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=    28  KP1=     75  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     82  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=    29  KP1=     76  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     83  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=    30  KP1=     77  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     88  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=    31  KP1=     78  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     89  TAN2=    1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 Line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=    32  KP1=    211  TAN1=   -1.0000   0.0003   0.0000
                  KP2=    218  TAN2=    1.0000  -0.0003   0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=    33  KP1=    210  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    220  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=    34  KP1=    215  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    217  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=    35  KP1=    214  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    216  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=    36  KP1=    209  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    219  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=    37  KP1=    208  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    159  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=    38  KP1=    213  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    155  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=    39  KP1=    151  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    152  TAN2=    1.0000   0.0000   0.0000
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LINE CONNECTS KEYPOINTS    145   146
 LINE NO.=    40  KP1=    145  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    146  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    139   140
 LINE NO.=    41  KP1=    139  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    140  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    134   135
 LINE NO.=    42  KP1=    134  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    135  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     14    15
 LINE NO.=    43  KP1=     14  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     15  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     19    20
 LINE NO.=    44  KP1=     19  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     20  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     25    26
 LINE NO.=    45  KP1=     25  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     26  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     31    32
 LINE NO.=    46  KP1=     31  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     32  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     98    35
 LINE NO.=    47  KP1=     98  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     35  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     92    39
 LINE NO.=    48  KP1=     92  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     39  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     93   106
 LINE NO.=    49  KP1=     93  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    106  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     99   102
 LINE NO.=    50  KP1=     99  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    102  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    100   103
 LINE NO.=    51  KP1=    100  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    103  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     94   107
 LINE NO.=    52  KP1=     94  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    107  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     95   104
 LINE NO.=    53  KP1=     95  TAN1=   -1.0000   -0.0003    0.0000
                  KP2=    104  TAN2=    1.0000    0.0003    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 3 Tube Widths on End Column

LINE CONNECTS KEYPOINTS    162   163
 LINE NO.=    54  KP1=    162  TAN1=   -1.0000    0.0002    0.0000
                  KP2=    163  TAN2=    1.0000   -0.0002    0.0000

LINE CONNECTS KEYPOINTS    160   161
 LINE NO.=    55  KP1=    160  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    161  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    156   157
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 LINE NO.=    56  KP1=    156  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    157  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    153   154
 LINE NO.=    57  KP1=    153  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    154  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    147   148
 LINE NO.=    58  KP1=    147  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    148  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    142  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    137  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     17  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     22  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     28  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     34  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     37  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     41  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -1.0000  -0.0002   0.0000
                  KP2=     43  TAN2=    1.0000   0.0002   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    200  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    204  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    209  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    214  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    216  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=     73  KP1=    220  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    219  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=     74  KP1=    221  TAN1=    0.0002  -1.0000   0.0000
                   KP2=    162  TAN2=   -0.0002   1.0000   0.0000

LINE CONNECTS KEYPOINTS    199   198
 LINE NO.=     75  KP1=    199  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    198  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=     76  KP1=    203  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    202  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=     77  KP1=    208  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    145  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=     78  KP1=    213  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    151  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=     79  KP1=    155  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    152  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=     80  KP1=    159  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    146  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=     81  KP1=    160  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    147  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=     82  KP1=    156  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    153  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=     83  KP1=    157  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    154  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=     84  KP1=    161  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    148  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=     85  KP1=    133  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     13  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=     86  KP1=    138  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     18  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=     87  KP1=    139  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     19  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=     88  KP1=    134  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     14  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=     89  KP1=    135  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     15  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
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LINE NO.=	90	KP1=	140	TAN1=	0.0000	-1.0000	0.0000
		KP2=	20	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			141	21			
LINE NO.=	91	KP1=	141	TAN1=	0.0000	-1.0000	0.0000
		KP2=	21	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			136	16			
LINE NO.=	92	KP1=	136	TAN1=	0.0000	-1.0000	0.0000
		KP2=	16	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			137	17			
LINE NO.=	93	KP1=	137	TAN1=	0.0000	-1.0000	0.0000
		KP2=	17	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			142	22			
LINE NO.=	94	KP1=	142	TAN1=	0.0000	-1.0000	0.0000
		KP2=	22	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			143	23			
LINE NO.=	95	KP1=	143	TAN1=	0.0000	-1.0000	0.0000
		KP2=	23	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			80	81			
LINE NO.=	96	KP1=	80	TAN1=	0.0000	-1.0000	0.0000
		KP2=	81	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			85	86			
LINE NO.=	97	KP1=	85	TAN1=	0.0000	-1.0000	0.0000
		KP2=	86	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			25	92			
LINE NO.=	98	KP1=	25	TAN1=	0.0000	-1.0000	0.0000
		KP2=	92	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			31	98			
LINE NO.=	99	KP1=	31	TAN1=	0.0000	-1.0000	0.0000
		KP2=	98	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			32	35			
LINE NO.=	100	KP1=	32	TAN1=	0.0000	-1.0000	0.0000
		KP2=	35	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			26	39			
LINE NO.=	101	KP1=	26	TAN1=	0.0000	-1.0000	0.0000
		KP2=	39	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			27	40			
LINE NO.=	102	KP1=	27	TAN1=	0.0000	-1.0000	0.0000
		KP2=	40	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			33	36			
LINE NO.=	103	KP1=	33	TAN1=	0.0000	-1.0000	0.0000
		KP2=	36	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			34	37			
LINE NO.=	104	KP1=	34	TAN1=	0.0000	-1.0000	0.0000
		KP2=	37	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			28	41			
LINE NO.=	105	KP1=	28	TAN1=	0.0000	-1.0000	0.0000
		KP2=	41	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			29	38			
LINE NO.=	106	KP1=	29	TAN1=	-0.0003	-1.0000	0.0000
		KP2=	38	TAN2=	0.0003	1.0000	0.0000
LINE CONNECTS KEYPOINTS			82	83			
LINE NO.=	107	KP1=	82	TAN1=	0.0000	-1.0000	0.0000
		KP2=	83	TAN2=	0.0000	1.0000	0.0000

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LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=    108  KP1=     87  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     88  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=    109  KP1=     93  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     94  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     99   100
 LINE NO.=    110  KP1=     99  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    100  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=    111  KP1=    102  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    103  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=    112  KP1=    106  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    107  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=    113  KP1=     42  TAN1=    -0.0002  -1.0000   0.0000
                   KP2=    109  TAN2=     0.0002   1.0000   0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=    114  KP1=    158  TAN1=     0.0003  -1.0000   0.0000
                   KP2=    149  TAN2=    -0.0003   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=    115  KP1=    207  TAN1=    -0.0001  -1.0000   0.0000
                   KP2=    206  TAN2=     0.0001   1.0000   0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=    116  KP1=    212  TAN1=    -0.0001  -1.0000   0.0000
                   KP2=    211  TAN2=     0.0001   1.0000   0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=    117  KP1=    150  TAN1=     1.0000   0.0001   0.0000
                   KP2=    149  TAN2=    -1.0000  -0.0001   0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=    118  KP1=    144  TAN1=     1.0000   0.0001   0.0000
                   KP2=    143  TAN2=    -1.0000  -0.0001   0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=    119  KP1=     24  TAN1=     1.0000  -0.0001   0.0000
                   KP2=     23  TAN2=    -1.0000   0.0001   0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=    120  KP1=     30  TAN1=     1.0000  -0.0001   0.0000
                   KP2=     29  TAN2=    -1.0000   0.0001   0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=    121  KP1=     96  TAN1=    -0.0001   1.0000   0.0000
                   KP2=     95  TAN2=     0.0001  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=    122  KP1=     90  TAN1=    -0.0001   1.0000   0.0000
                   KP2=     89  TAN2=     0.0001  -1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
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LINE NO.= 123 KP1= 197 TAN1= 0.0000 -1.0000 0.0000
KP2= 196 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 206 205
LINE NO.= 124 KP1= 206 TAN1= 0.1961 -0.9806 0.0000
KP2= 205 TAN2= -0.1961 0.9806 0.0000

LINE CONNECTS KEYPOINTS 211 210
LINE NO.= 125 KP1= 211 TAN1= -0.1961 -0.9806 0.0000
KP2= 210 TAN2= 0.1961 0.9806 0.0000

LINE CONNECTS KEYPOINTS 207 212
LINE NO.= 126 KP1= 207 TAN1= -0.9850 -0.1726 0.0000
KP2= 212 TAN2= 0.9850 0.1726 0.0000

LINE CONNECTS KEYPOINTS 206 211
LINE NO.= 127 KP1= 206 TAN1= -1.0000 0.0000 0.0000
KP2= 211 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 205 210
LINE NO.= 128 KP1= 205 TAN1= -1.0000 0.0000 0.0000
KP2= 210 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 218 220
LINE NO.= 129 KP1= 218 TAN1= -0.8619 -0.5070 0.0000
KP2= 220 TAN2= 0.8619 0.5070 0.0000

LINE CONNECTS KEYPOINTS 220 221
LINE NO.= 130 KP1= 220 TAN1= -0.8562 -0.5166 0.0000
KP2= 221 TAN2= 0.8562 0.5166 0.0000

LINE CONNECTS KEYPOINTS 193 192
LINE NO.= 131 KP1= 193 TAN1= 0.0000 -1.0000 0.0000
KP2= 192 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 204 203
LINE NO.= 132 KP1= 204 TAN1= 0.0000 -1.0000 0.0000
KP2= 203 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 209 208
LINE NO.= 133 KP1= 209 TAN1= 0.0000 -1.0000 0.0000
KP2= 208 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 204 209
LINE NO.= 134 KP1= 204 TAN1= -1.0000 0.0000 0.0000
KP2= 209 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 203 208
LINE NO.= 135 KP1= 203 TAN1= -1.0000 0.0000 0.0000
KP2= 208 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 219 159
LINE NO.= 136 KP1= 219 TAN1= 0.0000 -1.0000 0.0000
KP2= 159 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 162 160
LINE NO.= 137 KP1= 162 TAN1= -0.3714 -0.9285 0.0000
KP2= 160 TAN2= 0.3714 0.9285 0.0000

LINE CONNECTS KEYPOINTS 163 161
LINE NO.= 138 KP1= 163 TAN1= -0.5166 -0.8562 0.0000
KP2= 161 TAN2= 0.5166 0.8562 0.0000

LINE CONNECTS KEYPOINTS 161 158
LINE NO.= 139 KP1= 161 TAN1= -0.5070 -0.8619 0.0000
KP2= 158 TAN2= 0.5070 0.8619 0.0000

LINE CONNECTS KEYPOINTS 219 162
LINE NO.= 140 KP1= 219 TAN1= -0.9285 -0.3714 0.0000
KP2= 162 TAN2= 0.9285 0.3714 0.0000

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 LINE CONNECTS KEYPOINTS    159   160
  LINE NO.=   141  KP1=     159  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     160  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    189   188
  LINE NO.=   142  KP1=     189  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     188  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    202   138
  LINE NO.=   143  KP1=     202  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     138  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    145   139
  LINE NO.=   144  KP1=     145  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     139  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    202   145
  LINE NO.=   145  KP1=     202  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     145  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    138   139
  LINE NO.=   146  KP1=     138  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     139  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    146   140
  LINE NO.=   147  KP1=     146  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     140  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    147   141
  LINE NO.=   148  KP1=     147  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     141  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    146   147
  LINE NO.=   149  KP1=     146  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     147  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    140   141
  LINE NO.=   150  KP1=     140  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     141  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    148   142
  LINE NO.=   151  KP1=     148  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     142  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    149   143
  LINE NO.=   152  KP1=     149  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     143  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS    148   149
  LINE NO.=   153  KP1=     148  TAN1=   -0.9806   -0.1961    0.0000
                   KP2=     149  TAN2=    0.9806    0.1961    0.0000

 LINE CONNECTS KEYPOINTS    142   143
  LINE NO.=   154  KP1=     142  TAN1=   -0.9806    0.1961    0.0000
                   KP2=     143  TAN2=    0.9806   -0.1961    0.0000

 LINE CONNECTS KEYPOINTS    150   144
  LINE NO.=   155  KP1=     150  TAN1=   -0.1726   -0.9850    0.0000
                   KP2=     144  TAN2=    0.1726    0.9850    0.0000

 LINE CONNECTS KEYPOINTS     69    70
  LINE NO.=   156  KP1=      69  TAN1=    0.0000   -1.0000    0.0000
                   KP2=      70  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     18    85
  LINE NO.=   157  KP1=      18  TAN1=    0.0000   -1.0000    0.0000
                   KP2=      85  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     19    25
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 LINE NO.=   158  KP1=     19  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     25  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=     18  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     19  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     85    25
 LINE NO.=   160  KP1=     85  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     25  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     20    26
 LINE NO.=   161  KP1=     20  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     26  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     21    27
 LINE NO.=   162  KP1=     21  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     27  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     20    21
 LINE NO.=   163  KP1=     20  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     21  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     26    27
 LINE NO.=   164  KP1=     26  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     27  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     22    28
 LINE NO.=   165  KP1=     22  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     28  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     22    23
 LINE NO.=   166  KP1=     22  TAN1=   -0.9806  -0.1961   0.0000
                  KP2=     23  TAN2=    0.9806   0.1961   0.0000

LINE CONNECTS KEYPOINTS     28    29
 LINE NO.=   167  KP1=     28  TAN1=   -0.9806   0.1961   0.0000
                  KP2=     29  TAN2=    0.9806  -0.1961   0.0000

LINE CONNECTS KEYPOINTS     23    29
 LINE NO.=   168  KP1=     23  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     29  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     24    30
 LINE NO.=   169  KP1=     24  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     30  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     73    74
 LINE NO.=   170  KP1=     73  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     74  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     86    87
 LINE NO.=   171  KP1=     86  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     87  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     92    93
 LINE NO.=   172  KP1=     92  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     93  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     86    92
 LINE NO.=   173  KP1=     86  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     92  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     87    93
 LINE NO.=   174  KP1=     87  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     93  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     39   106
 LINE NO.=   175  KP1=     39  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    106  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS     40    42
 LINE NO.=    176  KP1=     40  TAN1=    0.3714  -0.9285   0.0000
                   KP2=     42  TAN2=   -0.3714   0.9285   0.0000

LINE CONNECTS KEYPOINTS     39    40
 LINE NO.=    177  KP1=     39  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     40  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=    178  KP1=    106  TAN1=   -0.9285   0.3714   0.0000
                   KP2=     42  TAN2=    0.9285  -0.3714   0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=    179  KP1=     38  TAN1=    0.5070  -0.8619   0.0000
                   KP2=     41  TAN2=   -0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=    180  KP1=     41  TAN1=    0.5166  -0.8562   0.0000
                   KP2=     43  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=    181  KP1=     77  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     78  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=    182  KP1=     88  TAN1=   -0.1961  -0.9806   0.0000
                   KP2=     89  TAN2=    0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=    183  KP1=     94  TAN1=    0.1961  -0.9806   0.0000
                   KP2=     95  TAN2=   -0.1961   0.9806   0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=    184  KP1=     88  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     94  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=    185  KP1=     89  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     95  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=    186  KP1=     90  TAN1=   -0.9850   0.1726   0.0000
                   KP2=     96  TAN2=    0.9850  -0.1726   0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=    187  KP1=    109  TAN1=    0.8562  -0.5166   0.0000
                   KP2=    107  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=    188  KP1=    107  TAN1=    0.8619  -0.5070   0.0000
                   KP2=    104  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=    189  KP1=    224  TAN1=   -0.9850  -0.1726   0.0000
                   KP2=    225  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=    190  KP1=    230  TAN1=   -0.9850  -0.1726   0.0000
                   KP2=    231  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=    191  KP1=    236  TAN1=   -0.9850  -0.1726   0.0000
                   KP2=    237  TAN2=    0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=    192  KP1=    226  TAN1=   -0.8619  -0.5070   0.0000
                   KP2=    227  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    227   228
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 LINE NO.=   193  KP1=    227  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    228  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    232   233
 LINE NO.=   194  KP1=    232  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=    233  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    233   234
 LINE NO.=   195  KP1=    233  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    234  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    238   239
 LINE NO.=   196  KP1=    238  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=    239  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    239   240
 LINE NO.=   197  KP1=    239  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    240  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    171   170
 LINE NO.=   198  KP1=    171  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    170  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    170   169
 LINE NO.=   199  KP1=    170  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    169  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    178   177
 LINE NO.=   200  KP1=    178  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    177  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    177   176
 LINE NO.=   201  KP1=    177  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    176  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    185   184
 LINE NO.=   202  KP1=    185  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    184  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    184   183
 LINE NO.=   203  KP1=    184  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    183  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    168   167
 LINE NO.=   204  KP1=    168  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    167  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS    175   174
 LINE NO.=   205  KP1=    175  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    174  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS    182   181
 LINE NO.=   206  KP1=    182  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    181  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     47    48
 LINE NO.=   207  KP1=     47  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     48  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     54    55
 LINE NO.=   208  KP1=     54  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     55  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     61    62
 LINE NO.=   209  KP1=     61  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     62  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     49    50
 LINE NO.=   210  KP1=     49  TAN1=    0.5070  -0.8619   0.0000
                  KP2=     50  TAN2=   -0.5070   0.8619   0.0000
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LINE CONNECTS KEYPOINTS     50    51
 LINE NO.=    211  KP1=     50  TAN1=    0.5166  -0.8562   0.0000
                   KP2=     51  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS     56    57
 LINE NO.=    212  KP1=     56  TAN1=    0.5070  -0.8619   0.0000
                   KP2=     57  TAN2=   -0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS     57    58
 LINE NO.=    213  KP1=     57  TAN1=    0.5166  -0.8562   0.0000
                   KP2=     58  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS     63    64
 LINE NO.=    214  KP1=     63  TAN1=    0.5070  -0.8619   0.0000
                   KP2=     64  TAN2=   -0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS     64    65
 LINE NO.=    215  KP1=     64  TAN1=    0.5166  -0.8562   0.0000
                   KP2=     65  TAN2=   -0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    117   116
 LINE NO.=    216  KP1=    117  TAN1=    0.8562  -0.5166   0.0000
                   KP2=    116  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    116   115
 LINE NO.=    217  KP1=    116  TAN1=    0.8619  -0.5070   0.0000
                   KP2=    115  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    124   123
 LINE NO.=    218  KP1=    124  TAN1=    0.8562  -0.5166   0.0000
                   KP2=    123  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    123   122
 LINE NO.=    219  KP1=    123  TAN1=    0.8619  -0.5070   0.0000
                   KP2=    122  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    131   130
 LINE NO.=    220  KP1=    131  TAN1=    0.8562  -0.5166   0.0000
                   KP2=    130  TAN2=   -0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    130   129
 LINE NO.=    221  KP1=    130  TAN1=    0.8619  -0.5070   0.0000
                   KP2=    129  TAN2=   -0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    114   113
 LINE NO.=    222  KP1=    114  TAN1=    0.9850  -0.1726   0.0000
                   KP2=    113  TAN2=   -0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    121   120
 LINE NO.=    223  KP1=    121  TAN1=    0.9850  -0.1726   0.0000
                   KP2=    120  TAN2=   -0.9850   0.1726   0.0000

LINE CONNECTS KEYPOINTS    128   127
 LINE NO.=    224  KP1=    128  TAN1=    0.9850  -0.1726   0.0000
                   KP2=    127  TAN2=   -0.9850   0.1726   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 7 tube thickness

LINE CONNECTS KEYPOINTS    196   195
 LINE NO.=    225  KP1=    196  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    195  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   201
 LINE NO.=    226  KP1=    205  TAN1=    0.7071  -0.7071   0.0000
                   KP2=    201  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    204   200
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LINE NO.=	227	KP1=	204	TAN1=	0.7071	0.7071	0.0000
		KP2=	200	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			193	194			
LINE NO.=	228	KP1=	193	TAN1=	0.0000	1.0000	0.0000
		KP2=	194	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			210	215			
LINE NO.=	229	KP1=	210	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	215	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			220	217			
LINE NO.=	230	KP1=	220	TAN1=	0.7071	-0.7071	0.0000
		KP2=	217	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			219	216			
LINE NO.=	231	KP1=	219	TAN1=	0.7071	0.7071	0.0000
		KP2=	216	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			209	214			
LINE NO.=	232	KP1=	209	TAN1=	-0.7071	0.7071	0.0000
		KP2=	214	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			192	191			
LINE NO.=	233	KP1=	192	TAN1=	0.0000	-1.0000	0.0000
		KP2=	191	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			203	199			
LINE NO.=	234	KP1=	203	TAN1=	0.7071	-0.7071	0.0000
		KP2=	199	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			202	198			
LINE NO.=	235	KP1=	202	TAN1=	0.7071	0.7071	0.0000
		KP2=	198	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			189	190			
LINE NO.=	236	KP1=	189	TAN1=	0.0000	1.0000	0.0000
		KP2=	190	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			208	213			
LINE NO.=	237	KP1=	208	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	213	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			159	155			
LINE NO.=	238	KP1=	159	TAN1=	0.7071	-0.7071	0.0000
		KP2=	155	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			146	152			
LINE NO.=	239	KP1=	146	TAN1=	0.7071	0.7071	0.0000
		KP2=	152	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			145	151			
LINE NO.=	240	KP1=	145	TAN1=	-0.7071	0.7071	0.0000
		KP2=	151	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			160	156			
LINE NO.=	241	KP1=	160	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	156	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			161	157			
LINE NO.=	242	KP1=	161	TAN1=	0.7071	-0.7071	0.0000
		KP2=	157	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			148	154			
LINE NO.=	243	KP1=	148	TAN1=	0.7071	0.7071	0.0000
		KP2=	154	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			147	153			
LINE NO.=	244	KP1=	147	TAN1=	-0.7071	0.7071	0.0000
		KP2=	153	TAN2=	0.7071	-0.7071	0.0000

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LINE CONNECTS KEYPOINTS    188   187
 LINE NO.=   245  KP1=     188  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     187  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    138   133
 LINE NO.=   246  KP1=     138  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     133  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     18    13
 LINE NO.=   247  KP1=      18  TAN1=    0.7071    0.7071    0.0000
                  KP2=      13  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     69    68
 LINE NO.=   248  KP1=      69  TAN1=    0.0000    1.0000    0.0000
                  KP2=      68  TAN2=    0.0000   -1.0000    0.0000

LINE CONNECTS KEYPOINTS    139   134
 LINE NO.=   249  KP1=     139  TAN1=   -0.7071   -0.7071    0.0000
                  KP2=     134  TAN2=    0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS    140   135
 LINE NO.=   250  KP1=     140  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     135  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     20    15
 LINE NO.=   251  KP1=      20  TAN1=    0.7071    0.7071    0.0000
                  KP2=      15  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     19    14
 LINE NO.=   252  KP1=      19  TAN1=   -0.7071    0.7071    0.0000
                  KP2=      14  TAN2=    0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS    141   136
 LINE NO.=   253  KP1=     141  TAN1=   -0.7071   -0.7071    0.0000
                  KP2=     136  TAN2=    0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS    142   137
 LINE NO.=   254  KP1=     142  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     137  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     22    17
 LINE NO.=   255  KP1=      22  TAN1=    0.7071    0.7071    0.0000
                  KP2=      17  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     21    16
 LINE NO.=   256  KP1=      21  TAN1=   -0.7071    0.7071    0.0000
                  KP2=      16  TAN2=    0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     70    71
 LINE NO.=   257  KP1=      70  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      71  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     85    80
 LINE NO.=   258  KP1=      85  TAN1=    0.7071   -0.7071    0.0000
                  KP2=      80  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     86    81
 LINE NO.=   259  KP1=      86  TAN1=    0.7071    0.7071    0.0000
                  KP2=      81  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     73    72
 LINE NO.=   260  KP1=      73  TAN1=    0.0000    1.0000    0.0000
                  KP2=      72  TAN2=    0.0000   -1.0000    0.0000

LINE CONNECTS KEYPOINTS     25    31
 LINE NO.=   261  KP1=      25  TAN1=   -0.7071   -0.7071    0.0000
                  KP2=      31  TAN2=    0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     26    32
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 LINE NO.=   262  KP1=     26  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     32  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     39    35
 LINE NO.=   263  KP1=     39  TAN1=    0.7071   0.7071   0.0000
                  KP2=     35  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     92    98
 LINE NO.=   264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     98  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=     27  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     33  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=     28  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     34  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=     41  TAN1=    0.7071   0.7071   0.0000
                  KP2=     37  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=     40  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     36  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=     74  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     75  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=     87  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     82  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=     88  TAN1=    0.7071   0.7071   0.0000
                  KP2=     83  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=     77  TAN1=    0.0000   1.0000   0.0000
                  KP2=     76  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=     93  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     99  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=    106  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    102  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=    107  TAN1=    0.7071   0.7071   0.0000
                  KP2=    103  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=     94  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    100  TAN2=    0.7071  -0.7071   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=    222  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    207  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    223   224
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 LINE NO.=   278 KP1=    223 TAN1=   -1.0000   0.0000   0.0000
                 KP2=    224 TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279 KP1=    229 TAN1=   -1.0000   0.0000   0.0000
                 KP2=    230 TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    235   236
 LINE NO.=   280 KP1=    235 TAN1=   -1.0000   0.0000   0.0000
                 KP2=    236 TAN2=    0.9856   0.1691   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281 KP1=    212 TAN1=   -0.9844  -0.1762   0.0000
                 KP2=    218 TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282 KP1=    225 TAN1=   -0.9844  -0.1762   0.0000
                 KP2=    226 TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283 KP1=    231 TAN1=   -0.9844  -0.1762   0.0000
                 KP2=    232 TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284 KP1=    237 TAN1=   -0.9844  -0.1762   0.0000
                 KP2=    238 TAN2=    0.8655   0.5009   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285 KP1=    221 TAN1=   -0.8541  -0.5201   0.0000
                 KP2=    163 TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286 KP1=    228 TAN1=   -0.8541  -0.5201   0.0000
                 KP2=    171 TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287 KP1=    234 TAN1=   -0.8541  -0.5201   0.0000
                 KP2=    178 TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288 KP1=    240 TAN1=   -0.8541  -0.5201   0.0000
                 KP2=    185 TAN2=    0.5201   0.8541   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289 KP1=    158 TAN1=   -0.5009  -0.8655   0.0000
                 KP2=    150 TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290 KP1=    169 TAN1=   -0.5009  -0.8655   0.0000
                 KP2=    168 TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291 KP1=    176 TAN1=   -0.5009  -0.8655   0.0000
                 KP2=    175 TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292 KP1=    183 TAN1=   -0.5009  -0.8655   0.0000
                 KP2=    182 TAN2=    0.1762   0.9844   0.0000
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SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     24  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    167    47
 LINE NO.=   294  KP1=    167  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     47  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=    174  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     54  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=    181  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     61  TAN2=   -0.1691   0.9856   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=     30  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     38  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=     48  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     49  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=     55  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     56  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=     62  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     63  TAN2=   -0.5009   0.8655   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=     43  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    109  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=     51  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    117  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=     58  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    124  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=     65  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    131  TAN2=   -0.8541   0.5201   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=    104  TAN1=    0.8655  -0.5009   0.0000
                  KP2=     96  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    115   114
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 LINE NO.=   306  KP1=    115  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    114  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307  KP1=    122  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    121  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    129   128
 LINE NO.=   308  KP1=    129  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    128  TAN2=   -0.9844   0.1762   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=     90  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=    113  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=    120  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=    127  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=    222  TAN1=    0.0000   1.0000   0.0000
                  KP2=    223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=    207  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    224  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=    212  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    225  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=    218  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    226  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=    220  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    227  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=    221  TAN1=   -0.5201   0.8541   0.0000
                  KP2=    228  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=    163  TAN1=   -0.8541   0.5201   0.0000
                  KP2=    171  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=    161  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    170  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    158   169
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 LINE NO.=   321  KP1=    158  TAN1=   -0.8655   0.5009   0.0000
                  KP2=    169  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=    150  TAN1=   -0.9844   0.1762   0.0000
                  KP2=    168  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    144   167
 LINE NO.=   323  KP1=    144  TAN1=   -0.9856   0.1691   0.0000
                  KP2=    167  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=     24  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=     47  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=     30  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=     48  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=     38  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     49  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=     41  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     50  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=     43  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=     51  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=    109  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=    117  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=    107  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=    116  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=    104  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    115  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=     96  TAN1=   -0.1762  -0.9844   0.0000
                  KP2=    114  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=     90  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=    113  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=    110  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    112  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=    223  TAN1=    0.0000   1.0000   0.0000
                  KP2=    229  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=    224  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    230  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=    225  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    231  TAN2=    0.1762  -0.9844   0.0000
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LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=    338  KP1=    226  TAN1=   -0.5009   0.8655   0.0000
                   KP2=    232  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=    339  KP1=    227  TAN1=   -0.5130   0.8584   0.0000
                   KP2=    233  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    228   234
 LINE NO.=    340  KP1=    228  TAN1=   -0.5201   0.8541   0.0000
                   KP2=    234  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    171   178
 LINE NO.=    341  KP1=    171  TAN1=   -0.8541   0.5201   0.0000
                   KP2=    178  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    170   177
 LINE NO.=    342  KP1=    170  TAN1=   -0.8584   0.5130   0.0000
                   KP2=    177  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    169   176
 LINE NO.=    343  KP1=    169  TAN1=   -0.8655   0.5009   0.0000
                   KP2=    176  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    168   175
 LINE NO.=    344  KP1=    168  TAN1=   -0.9844   0.1762   0.0000
                   KP2=    175  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    167   174
 LINE NO.=    345  KP1=    167  TAN1=   -0.9856   0.1691   0.0000
                   KP2=    174  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     47    54
 LINE NO.=    346  KP1=     47  TAN1=   -0.9856  -0.1691   0.0000
                   KP2=     54  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     48    55
 LINE NO.=    347  KP1=     48  TAN1=   -0.9844  -0.1762   0.0000
                   KP2=     55  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     49    56
 LINE NO.=    348  KP1=     49  TAN1=   -0.8655  -0.5009   0.0000
                   KP2=     56  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     50    57
 LINE NO.=    349  KP1=     50  TAN1=   -0.8584  -0.5130   0.0000
                   KP2=     57  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     51    58
 LINE NO.=    350  KP1=     51  TAN1=   -0.8541  -0.5201   0.0000
                   KP2=     58  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    117   124
 LINE NO.=    351  KP1=    117  TAN1=   -0.5201  -0.8541   0.0000
                   KP2=    124  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    116   123
 LINE NO.=    352  KP1=    116  TAN1=   -0.5130  -0.8584   0.0000
                   KP2=    123  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    115   122
 LINE NO.=    353  KP1=    115  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=    122  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    114   121
 LINE NO.=    354  KP1=    114  TAN1=   -0.1762  -0.9844   0.0000
                   KP2=    121  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    113   120
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```
 LINE NO.=   355  KP1=    113  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=    120  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    112   119
 LINE NO.=   356  KP1=    112  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    119  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000
 line set 19 skirt thickness

LINE CONNECTS KEYPOINTS    229   235
 LINE NO.=   357  KP1=    229  TAN1=    0.0000   1.0000   0.0000
                  KP2=    235  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    230   236
 LINE NO.=   358  KP1=    230  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    236  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    231   237
 LINE NO.=   359  KP1=    231  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    237  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    232   238
 LINE NO.=   360  KP1=    232  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    238  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    233   239
 LINE NO.=   361  KP1=    233  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    239  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    234   240
 LINE NO.=   362  KP1=    234  TAN1=   -0.5201   0.8541   0.0000
                  KP2=    240  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    178   185
 LINE NO.=   363  KP1=    178  TAN1=   -0.8541   0.5201   0.0000
                  KP2=    185  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    177   184
 LINE NO.=   364  KP1=    177  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    184  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    176   183
 LINE NO.=   365  KP1=    176  TAN1=   -0.8655   0.5009   0.0000
                  KP2=    183  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    175   182
 LINE NO.=   366  KP1=    175  TAN1=   -0.9844   0.1762   0.0000
                  KP2=    182  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    174   181
 LINE NO.=   367  KP1=    174  TAN1=   -0.9856   0.1691   0.0000
                  KP2=    181  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     54    61
 LINE NO.=   368  KP1=     54  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=     61  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     55    62
 LINE NO.=   369  KP1=     55  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=     62  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     56    63
 LINE NO.=   370  KP1=     56  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     63  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     57    64
 LINE NO.=   371  KP1=     57  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     64  TAN2=    0.8584   0.5130   0.0000
```

```
LINE CONNECTS KEYPOINTS     58    65
 LINE NO.=   372  KP1=      58  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=      65  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    124   131
 LINE NO.=   373  KP1=     124  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=     131  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    123   130
 LINE NO.=   374  KP1=     123  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=     130  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    122   129
 LINE NO.=   375  KP1=     122  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=     129  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    121   128
 LINE NO.=   376  KP1=     121  TAN1=   -0.1762  -0.9844   0.0000
                  KP2=     128  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    120   127
 LINE NO.=   377  KP1=     120  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     127  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    119   126
 LINE NO.=   378  KP1=     119  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     126  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000
 lines to fill in lids
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=   379  KP1=     195  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     194  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=   380  KP1=     191  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     190  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=   381  KP1=     187  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      68  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=   382  KP1=      71  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      72  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=   383  KP1=      75  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      76  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=   384  KP1=     222  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     197  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=   385  KP1=      78  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     110  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 area set 1, tubes
```

```
 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    195   196   205   201

     AREA NUMBER =      1

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    200   201   205   204

     AREA NUMBER =      2

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    193   194   200   204

     AREA NUMBER =      3

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    191   192   203   199

     AREA NUMBER =      4

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    198   199   203   202

     AREA NUMBER =      5

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    189   190   198   202

     AREA NUMBER =      6

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    187   188   138   133

     AREA NUMBER =      7

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    133   138    18    13

     AREA NUMBER =      8

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     69    68    13    18

     AREA NUMBER =      9

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     71    70    85    80

     AREA NUMBER =     10

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     80    85    86    81

     AREA NUMBER =     11

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     73    72    81    86

     AREA NUMBER =     12

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     75    74    87    32

     AREA NUMBER =     13

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     82    87    88    83

     AREA NUMBER =     14
```

```
 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     77    76    83    88

     AREA NUMBER =     15

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    209   210   215   214

     AREA NUMBER =     16

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    215   210   220   217

     AREA NUMBER =     17

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    216   217   220   219

     AREA NUMBER =     18

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    209   214   216   219

     AREA NUMBER =     19

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    145   208   213   151

     AREA NUMBER =     20

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    213   208   159   155

     AREA NUMBER =     21

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    152   155   159   146

     AREA NUMBER =     22

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    145   151   152   146

     AREA NUMBER =     23

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    134   139   140   135

     AREA NUMBER =     24

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    135   140    20    15

     AREA NUMBER =     25

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     19    14    15    20

     AREA NUMBER =     26

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     19   139   134    14

     AREA NUMBER =     27

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     92    25    31    98

     AREA NUMBER =     28
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31     25     26     32

    AREA NUMBER =     29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32     26     39     35

    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92     98     35     39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94     93     99    100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99     93    106    102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102    106    107    103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    100    103    107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156    160    161    157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157    161    148    154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147    153    154    148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147    160    156    153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136    141    142    137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137    142     22     17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21     16     17     22

    AREA NUMBER =     42
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34

    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    202   203   208   145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146   159   160   147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188   189   202   138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138   202   145   139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139   145   146   140

    AREA NUMBER =     56
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142

    AREA NUMBER =     58

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     18   138   139    19

    AREA NUMBER =     59

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     20   140   141    21

    AREA NUMBER =     60

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     70    69    18    85

    AREA NUMBER =     61

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     85    18    19    25

    AREA NUMBER =     62

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     25    19    20    26

    AREA NUMBER =     63

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     26    20    21    27

    AREA NUMBER =     64

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     27    21    22    28

    AREA NUMBER =     65

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     86    85    25    92

    AREA NUMBER =     66

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     39    26    27    40

    AREA NUMBER =     67

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     74    73    86    87

    AREA NUMBER =     68

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     87    86    92    93

    AREA NUMBER =     69

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     93    92    39   106

    AREA NUMBER =     70
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     88     87     93     94

    AREA NUMBER =      71
 area set 3, end guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    196    197    206    205

    AREA NUMBER =      72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205    206    211    210

    AREA NUMBER =      73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206    207    212    211

    AREA NUMBER =      74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210    211    218    220

    AREA NUMBER =      75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148    161    158    149

    AREA NUMBER =      76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142    148    149    143

    AREA NUMBER =      77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143    149    150    144

    AREA NUMBER =      78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22    142    143     23

    AREA NUMBER =      79

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     28     22     23     29

    AREA NUMBER =      80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     29     23     24     30

    AREA NUMBER =      81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41     28     29     38

    AREA NUMBER =      82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     95     94    107    104

    AREA NUMBER =      83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     89     88     94     95
```

```
     AREA NUMBER =      84

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      90     89     95     96

     AREA NUMBER =      85

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      78     77     88     89

     AREA NUMBER =      86
 area set 4, corner guides

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     219    220    221    162

     AREA NUMBER =      87

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     159    219    162    160

     AREA NUMBER =      88

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     160    162    163    161

     AREA NUMBER =      89

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     107    106     42    109

     AREA NUMBER =      90

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     106     39     40     42

     AREA NUMBER =      91

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      42     40     41     43

     AREA NUMBER =      92

 ACTIVE COORDINATE SYSTEM SET TO       1  (CYLINDRICAL)
 area set 5, inner barrier

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     222    223    224    207

     AREA NUMBER =      93

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     207    224    225    212

     AREA NUMBER =      94

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     212    225    226    213

     AREA NUMBER =      95

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     218    226    227    220

     AREA NUMBER =      96

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     220    227    228    221

     AREA NUMBER =      97
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    163   171   170   161

    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104   115   114    96

    AREA NUMBER =    111
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90   113   112   110

    AREA NUMBER =    113
 area set 6, outer barrier

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         1,

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.250   TIME= 20:36:14
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.260   TIME= 20:36:14
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.270   TIME= 20:36:14
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.270   TIME= 20:36:14
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.270   TIME= 20:36:14
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.270   TIME= 20:36:14
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.270   TIME= 20:36:14
```

```
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.270   TIME= 20:36:14
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.280   TIME= 20:36:14
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.290   TIME= 20:36:14
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.290   TIME= 20:36:14
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.290   TIME= 20:36:14
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.290   TIME= 20:36:14
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.290   TIME= 20:36:14
Area 41 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.290   TIME= 20:36:14
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.290   TIME= 20:36:14
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.290   TIME= 20:36:14
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.290   TIME= 20:36:14
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.290   TIME= 20:36:14
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.300   TIME= 20:36:14
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.310   TIME= 20:36:14
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 64 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.320   TIME= 20:36:14
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.330   TIME= 20:36:14
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.340   TIME= 20:36:14
```

```
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.340   TIME= 20:36:14
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.340   TIME= 20:36:14
Area 90 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.340   TIME= 20:36:14
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:14
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:14
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:14
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:14
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.350   TIME= 20:36:15
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.360   TIME= 20:36:15
Area 111 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.370   TIME= 20:36:15
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.370   TIME= 20:36:15
Area 113 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2875     AND   2.2875
  KABS=  0.  TOLERANCE= 0.114375E-01

  113  AREAS (OF   509  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    21  AREAS (OF    509  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                         CP=     12.560   TIME= 20:36:29
Area 441 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.560   TIME= 20:36:29
Area 444 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.560   TIME= 20:36:29
Area 448 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.560   TIME= 20:36:29
Area 451 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 454 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 458 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 461 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 464 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 468 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 471 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 475 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 478 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 482 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 485 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     12.570   TIME= 20:36:29
Area 488 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 492 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 495 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 498 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 505 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      12.580   TIME= 20:36:29
Area 509 is not meshed.  Volume will be generated without elements.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2775     AND   2.2775
  KABS=  0.  TOLERANCE= 0.113875E-01

  113  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    373 USED FOR KEYPOINT(S)     521
KEYPOINT    375 USED FOR KEYPOINT(S)     522
KEYPOINT    377 USED FOR KEYPOINT(S)     523
KEYPOINT    379 USED FOR KEYPOINT(S)     458
KEYPOINT    381 USED FOR KEYPOINT(S)     540
KEYPOINT    383 USED FOR KEYPOINT(S)     542
KEYPOINT    385 USED FOR KEYPOINT(S)     496
KEYPOINT    387 USED FOR KEYPOINT(S)     524
KEYPOINT    389 USED FOR KEYPOINT(S)     527
KEYPOINT    391 USED FOR KEYPOINT(S)     528
KEYPOINT    393 USED FOR KEYPOINT(S)     531
KEYPOINT    395 USED FOR KEYPOINT(S)     532
KEYPOINT    397 USED FOR KEYPOINT(S)     533
KEYPOINT    399 USED FOR KEYPOINT(S)     514
KEYPOINT    401 USED FOR KEYPOINT(S)     545
KEYPOINT    403 USED FOR KEYPOINT(S)     544
KEYPOINT    405 USED FOR KEYPOINT(S)     492
KEYPOINT    407 USED FOR KEYPOINT(S)     535
KEYPOINT    409 USED FOR KEYPOINT(S)     538
KEYPOINT    410 USED FOR KEYPOINT(S)     537
LINE    837 USED FOR LINE(S)   1121
LINE    847 USED FOR LINE(S)   1124
LINE    852 USED FOR LINE(S)   1152
LINE    862 USED FOR LINE(S)   1157
LINE    867 USED FOR LINE(S)   1125
LINE    877 USED FOR LINE(S)   1131
LINE    887 USED FOR LINE(S)   1138
LINE    897 USED FOR LINE(S)   1141
LINE    902 USED FOR LINE(S)   1162
LINE    912 USED FOR LINE(S)   1160
LINE    917 USED FOR LINE(S)   1143
LINE    923 USED FOR LINE(S)   1149
```

```
 generate lines to fill in lid at top of WP
 lines tube height

LINE CONNECTS KEYPOINTS    414   421
 LINE NO.=  1121  KP1=    414  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    421  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    422   429
 LINE NO.=  1124  KP1=    422  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    429  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    430   437
 LINE NO.=  1125  KP1=    430  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    437  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    438   445
 LINE NO.=  1131  KP1=    438  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    445  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    446   453
 LINE NO.=  1138  KP1=    446  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    453  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    370   518
 LINE NO.=  1141  KP1=    370  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    518  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    539   413
 LINE NO.=  1143  KP1=    539  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    413  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =   832 1116 1120 1141
     (TRAVERSED IN SAME DIRECTION AS LINE   832)

    AREA NUMBER =    687

DEFINE AREA BY LIST OF LINES
     LINE LIST =   936  937  941 1121
     (TRAVERSED IN SAME DIRECTION AS LINE   936)

    AREA NUMBER =    688

DEFINE AREA BY LIST OF LINES
     LINE LIST =   946  947  951 1124
     (TRAVERSED IN SAME DIRECTION AS LINE   946)

    AREA NUMBER =    689

DEFINE AREA BY LIST OF LINES
     LINE LIST =   956  959  961 1125
     (TRAVERSED IN SAME DIRECTION AS LINE   956)

    AREA NUMBER =    690

DEFINE AREA BY LIST OF LINES
     LINE LIST =   966  969  971 1131
     (TRAVERSED IN SAME DIRECTION AS LINE   966)

    AREA NUMBER =    691

DEFINE AREA BY LIST OF LINES
     LINE LIST =   976  979  981 1138
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE   976)

    AREA NUMBER =    692

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   932 1143 1147 1151
      (TRAVERSED IN SAME DIRECTION AS LINE   932)

    AREA NUMBER =    693

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   842 1122 1123
      (TRAVERSED IN SAME DIRECTION AS LINE   842)

    AREA NUMBER =    694

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   985  989  990  993
      (TRAVERSED IN SAME DIRECTION AS LINE   985)

    AREA NUMBER =    695

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   997 1001 1002 1005
      (TRAVERSED IN SAME DIRECTION AS LINE   997)

    AREA NUMBER =    696

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1010 1013 1015 1018
      (TRAVERSED IN SAME DIRECTION AS LINE  1010)

    AREA NUMBER =    697

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1021 1025 1028 1029
      (TRAVERSED IN SAME DIRECTION AS LINE  1021)

    AREA NUMBER =    698

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1033 1037 1040 1041
      (TRAVERSED IN SAME DIRECTION AS LINE  1033)

    AREA NUMBER =    699

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   922 1144 1148
      (TRAVERSED IN SAME DIRECTION AS LINE   922)

    AREA NUMBER =    700

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   857 1153 1156
      (TRAVERSED IN SAME DIRECTION AS LINE   857)

    AREA NUMBER =    701

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1046 1049 1051 1054
      (TRAVERSED IN SAME DIRECTION AS LINE  1046)

    AREA NUMBER =    702

 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1058 1061 1063 1066
      (TRAVERSED IN SAME DIRECTION AS LINE  1058)

    AREA NUMBER =    703
```

```
 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1070 1073 1075 1078
      (TRAVERSED IN SAME DIRECTION AS LINE  1070)

     AREA NUMBER =     704

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   907 1159 1163
      (TRAVERSED IN SAME DIRECTION AS LINE   907)

     AREA NUMBER =     705

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   872 1126 1130
      (TRAVERSED IN SAME DIRECTION AS LINE   872)

     AREA NUMBER =     706

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   882 1132 1133 1137
      (TRAVERSED IN SAME DIRECTION AS LINE   882)

     AREA NUMBER =     707

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   892 1139 1140
      (TRAVERSED IN SAME DIRECTION AS LINE   892)

     AREA NUMBER =     708

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.3075     AND   2.3075
   KABS=  0.  TOLERANCE= 0.115375E-01

   135  AREAS (OF   708  DEFINED) SELECTED BY  ASEL  COMMAND.

 DRAG ALL SELECTED AREAS
      ALONG LINES
          3,

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 514 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 518 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 522 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 526 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 530 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 534 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 538 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 542 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 546 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
 Area 550 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     16.240   TIME= 20:36:38
```

```
Area 554 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.240   TIME= 20:36:38
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.240   TIME= 20:36:38
Area 562 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.240   TIME= 20:36:38
Area 566 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.240   TIME= 20:36:38
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.240   TIME= 20:36:38
Area 574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 578 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 586 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 590 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 595 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 598 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 599 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 601 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 602 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 605 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.250   TIME= 20:36:38
Area 607 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 16.250 TIME= 20:36:38
Area 608 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.250 TIME= 20:36:38
Area 609 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 610 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 611 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 612 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 613 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 614 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 615 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 616 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 617 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 618 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 619 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 620 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 621 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 622 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 623 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 624 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.260 TIME= 20:36:38
Area 625 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.270 TIME= 20:36:38
Area 626 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.270 TIME= 20:36:38
Area 627 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.270 TIME= 20:36:38
Area 628 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.270 TIME= 20:36:38
Area 629 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 16.270 TIME= 20:36:38
Area 630 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 633 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 635 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 638 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 639 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 641 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 642 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 645 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.270   TIME= 20:36:38
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 647 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 650 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
Area 653 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     16.280   TIME= 20:36:38
```

```
Area 654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.280   TIME= 20:36:38
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.280   TIME= 20:36:38
Area 656 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 659 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 662 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.290   TIME= 20:36:38
Area 665 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 668 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 671 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 674 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 677 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 678 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 679 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.300   TIME= 20:36:38
Area 680 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 681 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 682 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 683 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 684 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 685 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 686 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 687 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 688 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 689 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.310   TIME= 20:36:38
Area 690 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 691 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 692 is not meshed.  Volume will be generated without elements.

*** WARNING.***                          CP=     16.320   TIME= 20:36:38
Area 693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 694 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 695 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 697 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 698 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 699 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.320   TIME= 20:36:38
Area 700 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 701 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 703 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 704 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 706 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     16.330   TIME= 20:36:38
Area 708 is not meshed.  Volume will be generated without elements.
 lines at bottom lid used to be here

 Mesh Volumes

 Mesh the CS Tubes

 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     25.350   TIME= 20:36:57
Meshing of volume 50 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
          241     242     243     244     245     246     247     248
          249     250     251     252     253     254     255     256
          257     258     271     272     273     274     275     276
          277     278     279     280     281     282     283     284
          285     286     287     288


*** WARNING ***                          CP=     26.970   TIME= 20:37:00
Meshing of volume 55 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    55 WITH EXCESSIVE ASPECT RATIO ***
          781     782     783     784     785     786     787     788
          789     790     791     792     793     794     795     796
          797     798     811     812     813     814     815     816
          817     818     819     820     821     822     823     824
          825     826     827     828


*** WARNING ***                          CP=     27.530   TIME= 20:37:01
Meshing of volume 57 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.
```

```
     *** LIST OF ELEMENTS IN VOLUME    57 WITH EXCESSIVE ASPECT RATIO ***
         961     962     963     964     965     966     967     968
         969     970     971     972     973     974     975     976
         977     978     991     992     993     994     995     996
         997     998     999    1000    1001    1002    1003    1004
        1005    1006    1007    1008

*** WARNING ***                         CP=     29.100   TIME= 20:37:04
Meshing of volume 62 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    62 WITH EXCESSIVE ASPECT RATIO ***
         1501    1502    1503    1504    1505    1506    1507    1508
         1509    1510    1511    1512    1513    1514    1515    1516
         1517    1518    1531    1532    1533    1534    1535    1536
         1537    1538    1539    1540    1541    1542    1543    1544
         1545    1546    1547    1548

*** WARNING ***                         CP=     29.650   TIME= 20:37:05
Meshing of volume 64 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    64 WITH EXCESSIVE ASPECT RATIO ***
         1681    1682    1683    1684    1685    1686    1687    1688
         1689    1690    1691    1692    1693    1694    1695    1696
         1697    1698    1711    1712    1713    1714    1715    1716
         1717    1718    1719    1720    1721    1722    1723    1724
         1725    1726    1727    1728

*** WARNING ***                         CP=     31.220   TIME= 20:37:08
Meshing of volume 69 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
         2221    2222    2223    2224    2225    2226    2227    2228
         2229    2230    2231    2232    2233    2234    2235    2236
         2237    2238    2251    2252    2253    2254    2255    2256
         2257    2258    2259    2260    2261    2262    2263    2264
         2265    2266    2267    2268


NUMBER OF VOLUMES MESHED    =     24
MAXIMUM NODE NUMBER         =   4000
MAXIMUM ELEMENT NUMBER      =   2520
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP        1

   15  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     32.650   TIME= 20:37:10
Meshing of volume 72 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    72 WITH EXCESSIVE ASPECT RATIO ***
         2521    2536    2551    2566    2581    2596    2611    2626

*** WARNING ***                         CP=     32.890   TIME= 20:37:11
Meshing of volume 73 produced 46 elements with excessive aspect ratio.
```

Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 73 WITH EXCESSIVE ASPECT RATIO ***

2641	2642	2643	2644	2645	2646	2647	2648
2649	2650	2651	2652	2653	2654	2655	2656
2657	2658	2659	2660	2661	2662	2663	2671
2672	2673	2674	2675	2676	2677	2678	2679
2680	2681	2682	2683	2684	2685	2686	2687
2688	2689	2690	2691	2692	2693		

*** WARNING *** CP= 33.230 TIME= 20:37:12
Meshing of volume 74 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 74 WITH EXCESSIVE ASPECT RATIO ***

2701	2702	2703	2716	2717	2718	2731	2732
2733	2746	2747	2748	2761	2762	2763	2776
2777	2778	2791	2792	2793	2806	2807	2808

*** WARNING *** CP= 33.360 TIME= 20:37:12
Volume 75 area 75 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 33.380 TIME= 20:37:12
Volume 75 area 380 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 33.610 TIME= 20:37:12
Meshing of volume 75 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 75 WITH EXCESSIVE DISTORTION ***

2881	2882	2883	2884	2885	2886	2887	2888
2889	2890	2891	2892	2893	2894	2895	2896
2897	2898	2899	2900	2901	2902	2903	2904
2905	2906	2907	2908	2909	2910	2911	2912
2913	2914	2915	2916	2917	2918	2919	2920
2921	2922	2923	2924	2925	2926	2927	2928
2929	2930	2931	2932	2933	2934	2935	2936
2937	2938	2939	2940				

*** WARNING *** CP= 33.730 TIME= 20:37:13
Volume 76 area 76 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 33.740 TIME= 20:37:13
Volume 76 area 384 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 33.970 TIME= 20:37:13
Meshing of volume 76 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 76 WITH EXCESSIVE DISTORTION ***

2941	2942	2945	2946	2949	2950	2953	2954
2957	2958	2961	2962	2965	2966	2969	2970
2973	2974	2977	2978	2981	2982	2985	2986
2989	2990	2993	2994	2997	2998	3001	3002
3005	3006	3009	3010	3013	3014	3017	3018
3021	3022	3025	3026	3029	3030	3033	3034
3037	3038	3041	3042	3045	3046	3049	3050
3053	3054	3057	3058				

*** WARNING *** CP= 34.210 TIME= 20:37:13
Meshing of volume 77 produced 46 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 77 WITH EXCESSIVE ASPECT RATIO ***

```
      3061    3062    3063    3064    3065    3066    3067    3068
      3069    3070    3071    3072    3073    3074    3075    3076
      3077    3078    3079    3080    3081    3082    3091    3092
      3093    3094    3095    3096    3097    3098    3099    3100
      3101    3102    3103    3104    3105    3106    3107    3108
      3109    3110    3111    3112    3113    3114

*** WARNING ***                         CP=     34.580   TIME= 20:37:14
Meshing of volume 78 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    78 WITH EXCESSIVE ASPECT RATIO ***
      3121    3122    3123    3124    3125    3126    3151    3152
      3153    3154    3155    3156    3181    3182    3183    3184
      3185    3186    3211    3212    3213    3214    3215    3216

*** WARNING ***                         CP=     35.180   TIME= 20:37:15
Meshing of volume 80 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    80 WITH EXCESSIVE ASPECT RATIO ***
      3361    3362    3363    3364    3365    3366    3367    3368
      3369    3370    3371    3372    3373    3374    3375    3376
      3377    3378    3379    3380    3381    3382    3391    3392
      3393    3394    3395    3396    3397    3398    3399    3400
      3401    3402    3403    3404    3405    3406    3407    3408
      3409    3410    3411    3412    3413    3414

*** WARNING ***                         CP=     35.540   TIME= 20:37:16
Meshing of volume 81 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    81 WITH EXCESSIVE ASPECT RATIO ***
      3421    3422    3423    3424    3425    3426    3451    3452
      3453    3454    3455    3456    3481    3482    3483    3484
      3485    3486    3511    3512    3513    3514    3515    3516

*** WARNING ***                         CP=     35.670   TIME= 20:37:16
Volume 82 area 82 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     35.690   TIME= 20:37:16
Volume 82 area 404 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     35.940   TIME= 20:37:17
Meshing of volume 82 produced 60 elements with excessive distortion.

    *** LIST OF ELEMENTS IN VOLUME    82 WITH EXCESSIVE DISTORTION ***
      3543    3544    3547    3548    3551    3552    3555    3556
      3559    3560    3563    3564    3567    3568    3571    3572
      3575    3576    3579    3580    3583    3584    3587    3588
      3591    3592    3595    3596    3599    3600    3603    3604
      3607    3608    3611    3612    3615    3616    3619    3620
      3623    3624    3627    3628    3631    3632    3635    3636
      3639    3640    3643    3644    3647    3648    3651    3652
      3655    3656    3659    3660

*** WARNING ***                         CP=     36.070   TIME= 20:37:17
Volume 83 area 83 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     36.090   TIME= 20:37:17
Volume 83 area 408 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.
```

```
*** WARNING ***                          CP=     36.310   TIME= 20:37:18
Meshing of volume 83 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    83 WITH EXCESSIVE DISTORTION ***
         3721    3722    3723    3724    3725    3726    3727    3728
         3729    3730    3731    3732    3733    3734    3735    3736
         3737    3738    3739    3740    3741    3742    3743    3744
         3745    3746    3747    3748    3749    3750    3751    3752
         3753    3754    3755    3756    3757    3758    3759    3760
         3761    3762    3763    3764    3765    3766    3767    3768
         3769    3770    3771    3772    3773    3774    3775    3776
         3777    3778    3779    3780

*** WARNING ***                          CP=     36.580   TIME= 20:37:18
Meshing of volume 84 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         3781    3782    3783    3784    3785    3786    3787    3788
         3789    3790    3791    3792    3796    3797    3798    3799
         3800    3801    3802    3803    3804    3805    3806    3811
         3812    3813    3814    3815    3816    3817    3818    3819
         3820    3821    3822    3826    3827    3828    3829    3830
         3831    3832    3833    3834    3835    3836

*** WARNING ***                          CP=     36.920   TIME= 20:37:19
Meshing of volume 85 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    85 WITH EXCESSIVE ASPECT RATIO ***
         3841    3842    3843    3856    3857    3858    3871    3872
         3873    3886    3887    3888    3901    3902    3903    3916
         3917    3918    3931    3932    3933    3946    3947    3948

*** WARNING ***                          CP=     37.280   TIME= 20:37:20
Meshing of volume 86 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    86 WITH EXCESSIVE ASPECT RATIO ***
         3961    3976    3991    4006    4021    4036    4051    4066


NUMBER OF VOLUMES MESHED    =     15
MAXIMUM NODE NUMBER         =   6448
MAXIMUM ELEMENT NUMBER      =   4080
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP        1

   6  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     38.010   TIME= 20:37:21
Meshing of volume 88 produced 44 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
         4201    4202    4203    4204    4205    4206    4207    4208
         4209    4210    4211    4212    4213    4214    4215    4216
         4217    4218    4219    4220    4221    4231    4232    4233
```

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      4234    4235    4236    4237    4238    4239    4240    4241
      4242    4243    4244    4245    4246    4247    4248    4249
      4250    4251    4252    4253


 *** WARNING ***                                CP=     38.910   TIME= 20:37:22
 Meshing of volume 91 produced 44 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
         4501    4502    4503    4504    4505    4506    4507    4508
         4509    4510    4511    4512    4513    4514    4515    4516
         4517    4518    4519    4520    4522    4531    4532    4533
         4534    4535    4536    4537    4538    4539    4540    4541
         4542    4543    4544    4545    4546    4547    4548    4549
         4550    4551    4552    4554


 NUMBER OF VOLUMES MESHED    =      6
 MAXIMUM NODE NUMBER         =   7280
 MAXIMUM ELEMENT NUMBER      =   4680
  Mesh Inner Barrier

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3045
   KABS=  0.  TOLERANCE= 0.000000E+00

    269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.71295
   KABS=  0.  TOLERANCE= 0.000000E+00

    269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       92 STEP       1

     177  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.69095     AND  0.71295
   KABS=  0.  TOLERANCE= 0.000000E+00

     114  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
   KABS=  0.  TOLERANCE= 0.000000E+00

    197  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       92 STEP       1

     147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
   KABS=  0.  TOLERANCE= 0.000000E+00

     147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.70000E-02 AND   2.3045
   KABS=  0.  TOLERANCE= 0.000000E+00

    147  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 ELEMENT TYPE SET TO      5

 MATERIAL NUMBER SET TO     5
```

GENERATE NODES AND ELEMENTS IN ALL SELECTED VOLUMES

*** WARNING *** CP= 43.020 TIME= 20:37:30
Meshing of volume 93 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 93 WITH EXCESSIVE ASPECT RATIO ***

4681	4682	4683	4684	4685	4686	4696	4697
4698	4699	4700	4701	4711	4712	4713	4714
4715	4716	4726	4727	4728	4729	4730	4731
4741	4742	4743	4744	4745	4746	4756	4757
4758	4759	4760	4761	4771	4772	4773	4774
4775	4776	4786	4787	4788	4789	4790	4791

*** WARNING *** CP= 43.240 TIME= 20:37:30
Meshing of volume 94 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 94 WITH EXCESSIVE ASPECT RATIO ***

4801	4802	4803	4804	4805	4806	4807	4808
4809	4810	4811	4812	4813	4814	4815	4816
4817	4818	4819	4820	4821	4822	4823	4824
4825	4826	4827	4828	4829	4830	4831	4832
4833	4834	4835	4836	4837	4838	4839	4840
4841	4842	4843	4844	4845	4846	4847	4848
4849	4850	4851	4852	4853	4854	4855	4856
4857	4858	4859	4860				

*** WARNING *** CP= 43.690 TIME= 20:37:31
Meshing of volume 95 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 95 WITH EXCESSIVE ASPECT RATIO ***

4861	4862	4863	4864	4865	4866	4891	4892
4893	4894	4895	4896	4921	4922	4923	4924
4925	4926	4951	4952	4953	4954	4955	4956

*** WARNING *** CP= 43.900 TIME= 20:37:31
Meshing of volume 96 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 96 WITH EXCESSIVE ASPECT RATIO ***

4981	4982	4983	4984	4985	4986	4987	4988
4989	4990	4991	4992	4993	4994	4995	4996
4997	4998	4999	5000	5001	5002	5003	5004
5005	5006	5011	5012	5013	5014	5015	5016
5017	5018	5019	5020	5021	5022	5023	5024
5025	5026	5027	5028	5029	5030	5031	5032
5033	5034	5035	5036				

*** WARNING *** CP= 44.120 TIME= 20:37:32
Meshing of volume 97 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 97 WITH EXCESSIVE ASPECT RATIO ***

5041	5042	5043	5044	5045	5046	5047	5048
5049	5050	5051	5052	5053	5054	5055	5056
5057	5058	5059	5060	5061	5062	5063	5064
5065	5066	5067	5068	5069	5070	5071	5072
5073	5074	5075	5076	5077	5078	5079	5080
5081	5082	5083	5084	5085	5086	5087	5088
5089	5090	5091	5092	5093	5094	5095	5096
5097	5098	5099	5100				

*** WARNING *** CP= 44.570 TIME= 20:37:32
Meshing of volume 98 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 98 WITH EXCESSIVE ASPECT RATIO ***

5101	5102	5131	5132	5161	5162	5191	5192

*** WARNING *** CP= 44.800 TIME= 20:37:33
Meshing of volume 99 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 99 WITH EXCESSIVE ASPECT RATIO ***

5221	5222	5223	5224	5225	5226	5227	5228
5229	5230	5231	5232	5233	5234	5235	5236
5237	5238	5239	5240	5241	5242	5243	5244
5245	5246	5247	5248	5249	5250	5251	5252
5253	5254	5255	5256	5257	5258	5259	5260
5261	5262	5263	5264	5265	5266	5267	5268
5269	5270	5271	5272	5273	5274	5275	5276
5277	5278	5279	5280				

*** WARNING *** CP= 45.030 TIME= 20:37:33
Meshing of volume 100 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 100 WITH EXCESSIVE ASPECT RATIO ***

5281	5282	5283	5284	5285	5286	5287	5288
5289	5290	5291	5292	5293	5294	5295	5296
5297	5298	5299	5300	5301	5302	5303	5304
5305	5306	5311	5312	5313	5314	5315	5316
5317	5318	5319	5320	5321	5322	5323	5324
5325	5326	5327	5328	5329	5330	5331	5332
5333	5334	5335	5336				

*** WARNING *** CP= 45.480 TIME= 20:37:34
Meshing of volume 101 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 101 WITH EXCESSIVE ASPECT RATIO ***

5341	5342	5343	5344	5345	5346	5371	5372
5373	5374	5375	5376	5401	5402	5403	5404
5405	5406	5431	5432	5433	5434	5435	5436

*** WARNING *** CP= 45.700 TIME= 20:37:35
Meshing of volume 102 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 102 WITH EXCESSIVE ASPECT RATIO ***

5461	5462	5463	5464	5465	5466	5467	5468
5469	5470	5471	5472	5473	5474	5475	5476
5477	5478	5479	5480	5481	5482	5483	5484
5485	5486	5487	5488	5489	5490	5491	5492
5493	5494	5495	5496	5497	5498	5499	5500
5501	5502	5503	5504	5505	5506	5507	5508
5509	5510	5511	5512	5513	5514	5515	5516
5517	5518	5519	5520				

*** WARNING *** CP= 46.140 TIME= 20:37:35
Meshing of volume 103 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 103 WITH EXCESSIVE ASPECT RATIO ***

5521	5522	5523	5524	5525	5526	5551	5552
5553	5554	5555	5556	5581	5582	5583	5584
5585	5586	5611	5612	5613	5614	5615	5616

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*** WARNING ***                          CP=     46.840   TIME= 20:37:37
Meshing of volume 119 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   119 WITH EXCESSIVE ASPECT RATIO ***
         5697    5698    5699    5700    5701    5702    5703    5704
         5705    5706    5707    5708    5709    5710    5711    5712


*** WARNING ***                          CP=     47.730   TIME= 20:37:38
Meshing of volume 137 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   137 WITH EXCESSIVE ASPECT RATIO ***
         5793    5794    5795    5796    5797    5798    5799    5800
         5801    5802    5803    5804    5805    5806    5807    5808


*** WARNING ***                          CP=     48.030   TIME= 20:37:39
Meshing of volume 140 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   140 WITH EXCESSIVE ASPECT RATIO ***
         5825    5826    5827    5828    5829    5830    5831    5832
         5833    5834    5835    5836    5837    5838    5839    5840


*** WARNING ***                          CP=     48.320   TIME= 20:37:39
Meshing of volume 143 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   143 WITH EXCESSIVE ASPECT RATIO ***
         5857    5858    5859    5860    5861    5862    5863    5864
         5865    5866    5867    5868    5869    5870    5871    5872


*** WARNING ***                          CP=     48.560   TIME= 20:37:40
Meshing of volume 145 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   145 WITH EXCESSIVE ASPECT RATIO ***
         5881    5882    5883    5884    5885    5886    5887    5888
         5889    5890    5891    5892    5893    5894    5895    5896


*** WARNING ***                          CP=     54.880   TIME= 20:37:50
Volume 230 area 669 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     54.890   TIME= 20:37:51
Volume 230 area 1058 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     54.930   TIME= 20:37:51
Meshing of volume 230 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   230 WITH EXCESSIVE DISTORTION ***
         6657    6658    6659    6660    6661    6662    6663    6664


*** WARNING ***                          CP=     54.980   TIME= 20:37:51
Volume 231 area 670 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     54.990   TIME= 20:37:51
Volume 231 area 1061 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.
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*** WARNING ***                          CP=      55.040   TIME= 20:37:51
Meshing of volume 231 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   231 WITH EXCESSIVE DISTORTION ***
         6665    6666    6669    6670    6673    6674    6677    6678


*** WARNING ***                          CP=      55.560   TIME= 20:37:52
Volume 237 area 676 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      55.570   TIME= 20:37:52
Volume 237 area 1078 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      55.610   TIME= 20:37:52
Meshing of volume 237 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   237 WITH EXCESSIVE DISTORTION ***
         6747    6748    6751    6752    6755    6756    6759    6760


*** WARNING ***                          CP=      55.680   TIME= 20:37:52
Volume 238 area 677 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      55.690   TIME= 20:37:52
Volume 238 area 1081 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      55.730   TIME= 20:37:52
Meshing of volume 238 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   238 WITH EXCESSIVE DISTORTION ***
         6769    6770    6771    6772    6773    6774    6775    6776


*** WARNING ***                          CP=      57.490   TIME= 20:37:55
Volume 255 area 694 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      57.510   TIME= 20:37:55
Volume 255 area 1119 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      57.580   TIME= 20:37:55
Meshing of volume 255 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   255 WITH EXCESSIVE DISTORTION ***
         7121    7122    7123    7124    7125    7126    7127    7128
         7130    7132    7134    7136    7138    7142


*** WARNING ***                          CP=      58.250   TIME= 20:37:57
Volume 261 area 700 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      58.260   TIME= 20:37:57
Volume 261 area 1125 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=      58.330   TIME= 20:37:57
Meshing of volume 261 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   261 WITH EXCESSIVE DISTORTION ***
         7306    7310    7313    7314    7317    7318    7321    7322
         7323    7324    7325    7326    7327    7328


*** WARNING ***                          CP=      58.440   TIME= 20:37:57
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 Meshing of volume 262 produced 2 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   262 WITH EXCESSIVE DISTORTION ***
          7338    7342


 *** WARNING ***                                  CP=     58.950   TIME= 20:37:58
 Meshing of volume 266 produced 2 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   266 WITH EXCESSIVE DISTORTION ***
          7458    7462


 *** WARNING ***                                  CP=     58.980   TIME= 20:37:58
 Volume 267 area 706 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                                  CP=     58.990   TIME= 20:37:58
 Volume 267 area 1131 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                                  CP=     59.050   TIME= 20:37:58
 Meshing of volume 267 produced 14 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   267 WITH EXCESSIVE DISTORTION ***
          7474    7478    7481    7482    7485    7486    7489    7490
          7491    7492    7493    7494    7495    7496


 *** WARNING ***                                  CP=     59.250   TIME= 20:37:58
 Volume 269 area 708 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                                  CP=     59.270   TIME= 20:37:58
 Volume 269 area 1133 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                                  CP=     59.330   TIME= 20:37:58
 Meshing of volume 269 produced 14 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   269 WITH EXCESSIVE DISTORTION ***
          7529    7530    7531    7532    7533    7534    7535    7536
          7538    7540    7542    7544    7546    7550


 NUMBER OF VOLUMES MESHED   =    147
 MAXIMUM NODE NUMBER        =  11541
 MAXIMUM ELEMENT NUMBER     =   7552
  Mesh Upper Inner Barrier Adding Backfill Mass

 INVERT       FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       269 STEP        1

   122  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
   KABS=  0.  TOLERANCE= 0.000000E+00

    122  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3045
   KABS=  0.  TOLERANCE= 0.000000E+00

   122  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO        92 STEP        1
```

30 VOLUMES (OF 269 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ELEMENT TYPE SET TO 6

MATERIAL NUMBER SET TO 6

GENERATE NODES AND ELEMENTS IN ALL SELECTED VOLUMES

*** WARNING *** CP= 60.180 TIME= 20:38:00
Meshing of volume 104 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 104 WITH EXCESSIVE ASPECT RATIO ***

7553	7554	7555	7556	7557	7558	7559	7560
7561	7562	7563	7564	7565	7566	7567	7568
7569	7570	7571	7572	7573	7574	7575	7576
7577	7578	7579	7580	7581	7582	7583	7584
7585	7586	7587	7588	7589	7590	7591	7592
7593	7594	7595	7596	7597	7598	7599	7600
7601	7602	7603	7604	7605	7606	7607	7608
7609	7610	7611	7612				

*** WARNING *** CP= 60.650 TIME= 20:38:01
Meshing of volume 105 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 105 WITH EXCESSIVE ASPECT RATIO ***

7613	7614	7615	7616	7617	7618	7643	7644
7645	7646	7647	7648	7673	7674	7675	7676
7677	7678	7703	7704	7705	7706	7707	7708

*** WARNING *** CP= 60.870 TIME= 20:38:01
Meshing of volume 106 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 106 WITH EXCESSIVE ASPECT RATIO ***

7733	7734	7735	7736	7737	7738	7739	7740
7741	7742	7743	7744	7745	7746	7747	7748
7749	7750	7751	7752	7753	7754	7755	7756
7757	7758	7763	7764	7765	7766	7767	7768
7769	7770	7771	7772	7773	7774	7775	7776
7777	7778	7779	7780	7781	7782	7783	7784
7785	7786	7787	7788				

*** WARNING *** CP= 61.100 TIME= 20:38:02
Meshing of volume 107 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 107 WITH EXCESSIVE ASPECT RATIO ***

7793	7794	7795	7796	7797	7798	7799	7800
7801	7802	7803	7804	7805	7806	7807	7808
7809	7810	7811	7812	7813	7814	7815	7816
7817	7818	7819	7820	7821	7822	7823	7824
7825	7826	7827	7828	7829	7830	7831	7832
7833	7834	7835	7836	7837	7838	7839	7840
7841	7842	7843	7844	7845	7846	7847	7848
7849	7850	7851	7852				

*** WARNING *** CP= 61.540 TIME= 20:38:02
Meshing of volume 108 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 108 WITH EXCESSIVE ASPECT RATIO ***

7853	7854	7883	7884	7913	7914	7943	7944

*** WARNING *** CP= 61.780 TIME= 20:38:03
Meshing of volume 109 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 109 WITH EXCESSIVE ASPECT RATIO ***

7973	7974	7975	7976	7977	7978	7979	7980
7981	7982	7983	7984	7985	7986	7987	7988
7989	7990	7991	7992	7993	7994	7995	7996
7997	7998	7999	8000	8001	8002	8003	8004
8005	8006	8007	8008	8009	8010	8011	8012
8013	8014	8015	8016	8017	8018	8019	8020
8021	8022	8023	8024	8025	8026	8027	8028
8029	8030	8031	8032				

*** WARNING *** CP= 62.000 TIME= 20:38:03
Meshing of volume 110 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 110 WITH EXCESSIVE ASPECT RATIO ***

8033	8034	8035	8036	8037	8038	8039	8040
8041	8042	8043	8044	8045	8046	8047	8048
8049	8050	8051	8052	8053	8054	8055	8056
8057	8058	8063	8064	8065	8066	8067	8068
8069	8070	8071	8072	8073	8074	8075	8076
8077	8078	8079	8080	8081	8082	8083	8084
8085	8086	8087	8088				

*** WARNING *** CP= 62.450 TIME= 20:38:04
Meshing of volume 111 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 111 WITH EXCESSIVE ASPECT RATIO ***

8093	8094	8095	8096	8097	8098	8123	8124
8125	8126	8127	8128	8153	8154	8155	8156
8157	8158	8183	8184	8185	8186	8187	8188

*** WARNING *** CP= 62.680 TIME= 20:38:04
Meshing of volume 112 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 112 WITH EXCESSIVE ASPECT RATIO ***

8213	8214	8215	8216	8217	8218	8219	8220
8221	8222	8223	8224	8225	8226	8227	8228
8229	8230	8231	8232	8233	8234	8235	8236
8237	8238	8239	8240	8241	8242	8243	8244
8245	8246	8247	8248	8249	8250	8251	8252
8253	8254	8255	8256	8257	8258	8259	8260
8261	8262	8263	8264	8265	8266	8267	8268
8269	8270	8271	8272				

*** WARNING *** CP= 63.070 TIME= 20:38:05
Meshing of volume 113 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 113 WITH EXCESSIVE ASPECT RATIO ***

8273	8274	8275	8276	8277	8278	8279	8280
8281	8282	8283	8284	8303	8304	8305	8306
8307	8308	8309	8310	8311	8312	8313	8314
8333	8334	8335	8336	8337	8338	8339	8340
8341	8342	8343	8344	8363	8364	8365	8366
8367	8368	8369	8370	8371	8372	8373	8374

*** WARNING *** CP= 63.590 TIME= 20:38:06

```
Meshing of volume 129 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   129 WITH EXCESSIVE ASPECT RATIO ***
         8433    8434    8435    8436    8437    8438    8439    8440
         8441    8442    8443    8444    8445    8446    8447    8448


*** WARNING ***                         CP=     64.270   TIME= 20:38:07
Meshing of volume 147 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   147 WITH EXCESSIVE ASPECT RATIO ***
         8513    8514    8515    8516    8517    8518    8519    8520
         8521    8522    8523    8524    8525    8526    8527    8528


*** WARNING ***                         CP=     64.530   TIME= 20:38:07
Meshing of volume 150 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   150 WITH EXCESSIVE ASPECT RATIO ***
         8545    8546    8547    8548    8549    8550    8551    8552
         8553    8554    8555    8556    8557    8558    8559    8560


*** WARNING ***                         CP=     64.780   TIME= 20:38:08
Meshing of volume 153 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   153 WITH EXCESSIVE ASPECT RATIO ***
         8577    8578    8579    8580    8581    8582    8583    8584
         8585    8586    8587    8588    8589    8590    8591    8592


NUMBER OF VOLUMES MESHED   =     30
MAXIMUM NODE NUMBER        =  12897
MAXIMUM ELEMENT NUMBER     =   8616
 Mesh Lower Outer Barrier and Lids
 mesh upper outer barrier adding backfi.l mass

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   555  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     65.350   TIME= 20:38:09
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   555

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   606  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   Z
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     65.770   TIME= 20:38:10
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=  1161
```

```
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  1.0675     AND   1.5450
  KABS=  0.  TOLERANCE= 0.000000E+00

  1818  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71195     AND  0.71395
  KABS=  0.  TOLERANCE= 0.000000E+00

   262  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    35  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   12897 BY       1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP        1

   269  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO     1133 STEP        1

 1133  AREAS (OF  1133  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO     1604 STEP        1

 1604  LINES (OF  1604  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO     9001 STEP        1

   690  KEYPOINTS (OF    690  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO     8616 STEP        1

  8616  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT   FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO    12897 STEP        1

 12897  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism2.db
 FOR POSSIBLE RESUME FROM THIS POINT


***** ROUTINE COMPLETED *****  CP =        74.660


*****  ANSYS SOLUTION ROUTINE  *****

PERFORM A MODAL ANALYSIS
 THIS WILL BE A NEW ANALYSIS
```

```
 USE SUBSPACE ITERATION METHOD
  EXTRACT    8 MODES
  NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

 WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF       1
   FOR ALL APPLICABLE ENTITIES

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism2.db
  FOR POSSIBLE RESUME FROM THIS POINT

 *****  ANSYS SOLVE    COMMAND  *****

 *** WARNING ***                          CP=     85.930   TIME= 20:38:45
 Element 2881 has an angle between adjacent edges of 36.9687852 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.930   TIME= 20:38:45
 Element 2881 has an angle between adjacent edges of 143.022369 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.930   TIME= 20:38:45
 Element 2882 has an angle between adjacent edges of 36.9602219 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.930   TIME= 20:38:45
 Element 2882 has an angle between adjacent edges of 143.031215 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.940   TIME= 20:38:45
 Element 2883 has an angle between adjacent edges of 36.9687852 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.940   TIME= 20:38:45
 Element 2883 has an angle between adjacent edges of 143.022369 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.940   TIME= 20:38:45
 Element 2884 has an angle between adjacent edges of 36.9602219 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.940   TIME= 20:38:45
 Element 2884 has an angle between adjacent edges of 143.031215 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.940   TIME= 20:38:45
 Element 2885 has an angle between adjacent edges of 36.9687852 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.950   TIME= 20:38:46
 Element 2885 has an angle between adjacent edges of 143.022369 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.950   TIME= 20:38:46
 Element 2886 has an angle between adjacent edges of 36.9602219 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                          CP=     85.950   TIME= 20:38:46
```

Element 2886 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.950 TIME= 20:38:46
Element 2887 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.950 TIME= 20:38:46
Element 2887 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.950 TIME= 20:38:46
Element 2888 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2888 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2889 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2889 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2890 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2890 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.960 TIME= 20:38:46
Element 2891 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.970 TIME= 20:38:46
Element 2891 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.970 TIME= 20:38:46
Element 2892 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.970 TIME= 20:38:46
Element 2892 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.970 TIME= 20:38:46
Element 2893 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 85.970 TIME= 20:38:46

Element 2893 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.980 TIME= 20:38:46
Element 2894 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.980 TIME= 20:38:46
Element 2894 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.980 TIME= 20:38:46
Element 2895 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.980 TIME= 20:38:46
Element 2895 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.980 TIME= 20:38:46
Element 2896 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.990 TIME= 20:38:46
Element 2896 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.990 TIME= 20:38:46
Element 2897 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.990 TIME= 20:38:46
Element 2897 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.990 TIME= 20:38:46
Element 2898 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 85.990 TIME= 20:38:46
Element 2898 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46
Element 2899 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46
Element 2899 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46
Element 2900 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46

Element 2900 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46
Element 2901 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.000 TIME= 20:38:46
Element 2901 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2902 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2902 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2903 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2903 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2904 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.010 TIME= 20:38:46
Element 2904 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46
Element 2905 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46
Element 2905 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46
Element 2906 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46
Element 2906 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46
Element 2907 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.020 TIME= 20:38:46

Element 2907 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2908 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2908 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2909 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2909 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2910 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.030 TIME= 20:38:46
Element 2910 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2911 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2911 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2912 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2912 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2913 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.040 TIME= 20:38:46
Element 2913 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.050 TIME= 20:38:46
Element 2914 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.050 TIME= 20:38:46
Element 2914 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45

degrees.

*** WARNING *** CP= 86.050 TIME= 20:38:46
Element 2915 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.050 TIME= 20:38:46
Element 2915 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.050 TIME= 20:38:46
Element 2916 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2916 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2917 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2917 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2918 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2918 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.060 TIME= 20:38:46
Element 2919 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.070 TIME= 20:38:46
Element 2919 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.070 TIME= 20:38:46
Element 2920 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.070 TIME= 20:38:46
Element 2920 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.070 TIME= 20:38:46
Element 2921 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.070 TIME= 20:38:46
Element 2921 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.080 TIME= 20:38:46

Element 2922 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.080 TIME= 20:38:46
Element 2922 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.080 TIME= 20:38:46
Element 2923 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.080 TIME= 20:38:46
Element 2923 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.080 TIME= 20:38:46
Element 2924 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.090 TIME= 20:38:46
Element 2924 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.090 TIME= 20:38:46
Element 2925 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.090 TIME= 20:38:46
Element 2925 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.090 TIME= 20:38:46
Element 2926 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.090 TIME= 20:38:46
Element 2926 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2927 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2927 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2928 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2928 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2929 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.100 TIME= 20:38:46
Element 2929 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.110 TIME= 20:38:46
Element 2930 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.110 TIME= 20:38:46
Element 2930 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.110 TIME= 20:38:46
Element 2931 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.110 TIME= 20:38:46
Element 2931 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.120 TIME= 20:38:46
Element 2932 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.120 TIME= 20:38:46
Element 2932 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.120 TIME= 20:38:46
Element 2933 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.120 TIME= 20:38:46
Element 2933 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.120 TIME= 20:38:46
Element 2934 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2934 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2935 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2935 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2936 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2936 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.130 TIME= 20:38:46
Element 2937 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.140 TIME= 20:38:46
Element 2937 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.140 TIME= 20:38:46
Element 2938 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.140 TIME= 20:38:46
Element 2938 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.140 TIME= 20:38:46
Element 2939 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.140 TIME= 20:38:46
Element 2939 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2940 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2940 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2941 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2941 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2942 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.150 TIME= 20:38:46
Element 2942 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2945 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2945 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46

Element 2946 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2946 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2949 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2949 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2950 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.160 TIME= 20:38:46
Element 2950 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.170 TIME= 20:38:46
Element 2953 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.170 TIME= 20:38:46
Element 2953 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.170 TIME= 20:38:46
Element 2954 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.170 TIME= 20:38:46
Element 2954 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.180 TIME= 20:38:46
Element 2957 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.180 TIME= 20:38:46
Element 2957 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.180 TIME= 20:38:46
Element 2958 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.180 TIME= 20:38:46
Element 2958 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.180 TIME= 20:38:46

Element 2961 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.190 TIME= 20:38:46
Element 2961 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.190 TIME= 20:38:46
Element 2962 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.190 TIME= 20:38:46
Element 2962 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.190 TIME= 20:38:46
Element 2965 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.190 TIME= 20:38:46
Element 2965 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.200 TIME= 20:38:46
Element 2966 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.200 TIME= 20:38:46
Element 2966 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.200 TIME= 20:38:46
Element 2969 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.200 TIME= 20:38:46
Element 2969 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.200 TIME= 20:38:46
Element 2970 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.210 TIME= 20:38:46
Element 2970 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.210 TIME= 20:38:46
Element 2973 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.210 TIME= 20:38:46
Element 2973 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.210 TIME= 20:38:46

Element 2974 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.210 TIME= 20:38:46
Element 2974 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.220 TIME= 20:38:46
Element 2977 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.220 TIME= 20:38:46
Element 2977 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.220 TIME= 20:38:46
Element 2978 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.220 TIME= 20:38:46
Element 2978 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.220 TIME= 20:38:46
Element 2981 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.230 TIME= 20:38:46
Element 2981 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.230 TIME= 20:38:46
Element 2982 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.230 TIME= 20:38:46
Element 2982 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.230 TIME= 20:38:46
Element 2985 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.230 TIME= 20:38:46
Element 2985 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.240 TIME= 20:38:46
Element 2986 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.240 TIME= 20:38:46
Element 2986 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.240 TIME= 20:38:46

Element 2989 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.240 TIME= 20:38:46
Element 2989 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2990 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2990 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2993 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2993 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2994 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.250 TIME= 20:38:46
Element 2994 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.260 TIME= 20:38:46
Element 2997 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.260 TIME= 20:38:46
Element 2997 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.260 TIME= 20:38:46
Element 2998 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.260 TIME= 20:38:46
Element 2998 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.270 TIME= 20:38:46
Element 3001 has an angle between adjacent edges of 36.9776312 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.270 TIME= 20:38:46
Element 3001 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 86.270 TIME= 20:38:46

Element 3002 has an angle between adjacent edges of 143.022369 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.270 TIME= 20:38:46
Element 3002 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.270 TIME= 20:38:46
Element 3005 has an angle between adjacent edges of 36.9776312 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.280 TIME= 20:38:46
Element 3005 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.280 TIME= 20:38:46
Element 3006 has an angle between adjacent edges of 143.022369 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.280 TIME= 20:38:46
Element 3006 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.280 TIME= 20:38:46
Element 3009 has an angle between adjacent edges of 36.9776312 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.280 TIME= 20:38:46
Element 3009 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.290 TIME= 20:38:46
Element 3010 has an angle between adjacent edges of 143.022369 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.290 TIME= 20:38:46
Element 3010 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.290 TIME= 20:38:46
Element 3013 has an angle between adjacent edges of 36.9776312 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.290 TIME= 20:38:46
Element 3013 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.290 TIME= 20:38:46
Element 3014 has an angle between adjacent edges of 143.022369 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.300 TIME= 20:38:46
Element 3014 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 86.300 TIME= 20:38:46

```
 Element 3017 has an angle between adjacent edges of 36.9776312 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=     86.300   TIME= 20:38:46
 Element 3017 has an angle between adjacent edges of 149.518219 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=     86.300   TIME= 20:38:46
 Element 3018 has an angle between adjacent edges of 143.022369 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=     86.300   TIME= 20:38:46
 Element 3018 has an angle between adjacent edges of 143.022369 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 ***************************************************************************
 Error messages discontinued after 200 messages were displayed.
  More may exist.  See ( seism2.err ) for suppressed messages.
 ***************************************************************************

 *** NOTE ***                            CP=     90.380   TIME= 20:38:53
 The model data was checked and warning messages were found.
  Please review output or errors file ( seism2.err ) for these warning
  messages.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   20:38:53  APR 10, 1996 CP=     90.380
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337    FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .MODAL
      EXTRACTION METHOD. . . . . .SUBSPACE
   NUMBER OF MODES TO EXTRACT. . . . . .     8

                   L O A D   S T E P   O P T I O N S

   LOAD STEP NUMBER. . . . . .     1



          ***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

  CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

  TOTAL MASS =   11165.

                          MOM. OF INERTIA          MOM. OF INERTIA
     CENTROID              ABOUT ORIGIN             ABOUT CENTROID

 XC =  0.32998        IXX =   0.2171E+05       IXX =    6319.
 YC =  0.22502        IYY =   0.2141E+05       IYY =    5366.
 ZC =   1.1525        IZZ =    3654.           IZZ =    1873.
                      IXY =   -881.1           IXY =   -52.07
                      IYZ =   -2895.           IYZ =   0.6106
                      IZX =   -4249.           IZX =   -2.464


 *** MASS SUMMARY BY ELEMENT TYPE ***
```

TYPE	MASS
2	5499.34
3	332.670
4	180.515
5	95.0035
6	5057.97

Range of element maximum matrix coefficients in global coordinates
Maximum= 5.474720139E+11 at element 5101.
Minimum= 148626650 at element 6476.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	15.060	0.006
3	1560	SOLID45	9.210	0.006
4	600	SOLID45	3.600	0.006
5	2872	SOLID45	17.010	0.006
6	1064	SOLID45	6.520	0.006

Time at end of element matrix formulation CP= 151.53.

Estimated number of active DOF= 37495.
Maximum wavefront= 1397.

Time at end of matrix triangularization CP= 235.09.

SUBSPACE SIZE OF 12 VECTORS USED FOR CALCULATION OF FIRST 8 EIGENVECTORS.
MAXIMUM ITERATIONS = 100
NUMBER OF EQUATIONS = 37495
MAXIMUM WAVEFRONT = 1397
ITERATIONS PER SHIFT = 5
MAXIMUM MODES STORED = 12
MAXIMUM EIGENVALUE = 0.10000E+07
WORK SPACE (MBYTE) = 8.0875

Equation solver maximum pivot= 1.435813461E+12 at node 8454 UX.

Equation solver minimum pivot= 1939687.75 at node 7457 UY.

***** ITERATION 1 COMPLETE ***** CP= 3007.720 WALL= 22.0344

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	28.500850	0.00000000E+00	0.10000E+01
2	35.435089	0.00000000E+00	0.10000E+01
3	37.065221	0.00000000E+00	0.10000E+01
4	43.506112	0.00000000E+00	0.10000E+01
5	53.155403	0.00000000E+00	0.10000E+01
6	57.478751	0.00000000E+00	0.10000E+01
7	63.198089	0.00000000E+00	0.10000E+01
8	75.979652	0.00000000E+00	0.10000E+01
9	82.052553	0.00000000E+00	0.10000E+01
10	85.061637	0.00000000E+00	0.10000E+01
11	93.044340	0.00000000E+00	0.10000E+01
12	101.60571	0.00000000E+00	0.10000E+01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 1
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2597.650
CP TIME SINCE LAST SHIFT= 170.880

***** ITERATION 2 COMPLETE ***** CP= 3178.290 WALL= 22.1661

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.941691	28.500850	0.68723E+00
2	26.028957	35.435089	0.85333E+00
3	29.309110	37.065221	0.59929E+00
4	30.979887	43.506112	0.97215E+00
5	34.839971	53.155403	0.13278E+01
6	36.297893	57.478751	0.15076E+01
7	41.446687	63.198089	0.13250E+01
8	50.157048	75.979652	0.12947E+01
9	51.306181	82.052553	0.15577E+01
10	58.065537	85.061637	0.11460E+01
11	60.608634	93.044340	0.13567E+01
12	70.969451	101.60571	0.10497E+01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2597.650
CP TIME SINCE LAST SHIFT= 341.450

***** ITERATION 3 COMPLETE ***** CP= 3348.260 WALL= 22.2967

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.913403	21.941691	0.25834E-02
2	24.659111	26.028957	0.11419E+00
3	29.009763	29.309110	0.20744E-01
4	30.754720	30.979887	0.14696E-01
5	34.396433	34.839971	0.25956E-01
6	35.931035	36.297893	0.20524E-01
7	39.114522	41.446687	0.12280E+00
8	49.159351	50.157048	0.41002E-01
9	49.776636	51.306181	0.62401E-01
10	56.371883	58.065537	0.60991E-01
11	57.893687	60.608634	0.95990E-01
12	66.927901	70.969451	0.12442E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2597.650
CP TIME SINCE LAST SHIFT= 511.420

***** ITERATION 4 COMPLETE ***** CP= 3519.170 WALL= 22.4278

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.913260	21.913403	0.13074E-04
2	24.639311	24.659111	0.16078E-02
3	29.000459	29.009763	0.64170E-03
4	30.743154	30.754720	0.75260E-03
5	34.377880	34.396433	0.10797E-02
6	35.913686	35.931035	0.96639E-03
7	38.831700	39.114522	0.14620E-01
8	48.944075	49.159351	0.88162E-02
9	49.630606	49.776636	0.58933E-02
10	55.754432	56.371883	0.22272E-01
11	57.304604	57.893687	0.20665E-01
12	65.618464	66.927901	0.40309E-01

```
ITERATIONS SINCE LAST SHIFT=      4
TOTAL NUMBER OF ITERATIONS=       4
NUMBER OF MODES CONVERGED=        0
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  2597.650
CP TIME SINCE LAST SHIFT=        682.330


    *****  ITERATION    5  COMPLETE *****  CP=    3689.510  WALL=     22.5578

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   1     21.913258          21.913260          0.11790E-06
   2     24.638910          24.639311          0.32539E-04
   3     29.000091          29.000459          0.25403E-04
   4     30.742570          30.743154          0.38014E-04
   5     34.376474          34.377880          0.81783E-04
   6     35.912436          35.913686          0.69564E-04
   7     38.795985          38.831700          0.18420E-02
   8     48.877275          48.944075          0.27352E-02
   9     49.604301          49.630606          0.10609E-02
  10     55.412831          55.754432          0.12367E-01
  11     57.076372          57.304604          0.80134E-02
  12     65.043655          65.618464          0.17753E-01

ITERATIONS SINCE LAST SHIFT=      5
TOTAL NUMBER OF ITERATIONS=       5
NUMBER OF MODES CONVERGED=        1
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  2597.650
CP TIME SINCE LAST SHIFT=        852.670

*** NOTE ***                            CP=    3689.510   TIME= 22:33:28
NEW SHIFT= 24.5098271.

*** NOTE ***                            CP=    6285.350   TIME= 23:42:32
STURM number= 1 should be 1.


    *****  ITERATION    6  COMPLETE *****  CP=    6424.750  WALL=     23.8058

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  21.9132584

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   2     24.638900          24.638910          0.78284E-06
   3     29.000073          29.000091          0.12229E-05
   4     30.742539          30.742570          0.20122E-05
   5     34.376311          34.376474          0.94940E-05
   6     35.912321          35.912436          0.64103E-05
   7     38.790801          38.795985          0.26732E-03
   8     48.852023          48.877275          0.10341E-02
   9     49.595708          49.604301          0.34654E-03
  10     55.132484          55.412831          0.10196E-01
  11     56.913636          57.076372          0.57269E-02
  12     64.646623          65.043655          0.12321E-01

ITERATIONS SINCE LAST SHIFT=      1
TOTAL NUMBER OF ITERATIONS=       6
NUMBER OF MODES CONVERGED=        6
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=           24.510
CP TIME FOR TRIANGULARIZATION=  2596.130
CP TIME SINCE LAST SHIFT=        139.110
```

***** ITERATION 7 COMPLETE ***** CP= 6535.250 WALL= 23.8925

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9132584	2	24.6389001	3	29.0000733
4	30.7425386	5	34.3763108	6	35.9123214

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
7	38.790427	38.790801	0.19247E-04
8	48.845287	48.852023	0.27585E-03
9	49.593278	49.595708	0.98011E-04
10	54.909075	55.132484	0.81539E-02
11	56.797634	56.913636	0.40889E-02
12	64.284973	64.646623	0.11283E-01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 7
NUMBER OF MODES CONVERGED= 6
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 24.510
CP TIME FOR TRIANGULARIZATION= 2596.130
CP TIME SINCE LAST SHIFT= 249.620

***** ITERATION 8 COMPLETE ***** CP= 6645.890 WALL= 23.9792

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9132584	2	24.6389001	3	29.0000733
4	30.7425386	5	34.3763108	6	35.9123214

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
7	38.790398	38.790427	0.15080E-05
8	48.843455	48.845287	0.75017E-04
9	49.592534	49.593278	0.30000E-04
10	54.711766	54.909075	0.72257E-02
11	56.707302	56.797634	0.31885E-02
12	63.821860	64.284973	0.14565E-01

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 8
NUMBER OF MODES CONVERGED= 7
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 24.510
CP TIME FOR TRIANGULARIZATION= 2596.130
CP TIME SINCE LAST SHIFT= 360.250

***** ITERATION 9 COMPLETE ***** CP= 6752.830 WALL= 24.0642

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9132584	2	24.6389001	3	29.0000733
4	30.7425386	5	34.3763108	6	35.9123214
7	38.7903982				

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
8	48.842938	48.843455	0.21164E-04
9	49.592298	49.592534	0.95254E-05
10	54.530936	54.711766	0.66432E-02
11	56.633083	56.707302	0.26227E-02
12	63.156437	63.821860	0.21183E-01

ITERATIONS SINCE LAST SHIFT= 4
TOTAL NUMBER OF ITERATIONS= 9
NUMBER OF MODES CONVERGED= 7

```
 NUMBER OF WORKING VECTORS=       12
 CURRENT SHIFT POINT=            24.510
 CP TIME FOR TRIANGULARIZATION=  2596.130
 CP TIME SINCE LAST SHIFT=        467.190


     *****  ITERATION   10  COMPLETE *****  CP=    6859.230  WALL=     24.1494

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1  21.9132584           2  24.6389001           3  29.0000733
        4  30.7425386           5  34.3763108           6  35.9123214
        7  38.7903982

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
  MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
    8     48.842783         48.842938         0.63519E-05

 *** NOTE ***                            CP=   6859.240   TIME= 00:08:58
 NEW SHIFT= 48.9182431.

 *** NOTE ***                            CP=   9242.920   TIME= 00:51:13
 STURM number= 8 should be 8.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   00:51:16  APR 11, 1996 CP=   9243.260
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)


    1       21.913258
    2       24.638900
    3       29.000073
    4       30.742539
    5       34.376311
    6       35.912321
    7       38.790398
    8       48.842783


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37495
  R.M.S. WAVEFRONT SIZE =   902.2


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096
       44.625 MB WRITTEN ON ELEMENT MATRIX FILE: seism2.emat
       29.703 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism2.esav
       21.094 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism2.full
        2.719 MB WRITTEN ON MODAL MATRIX FILE: seism2.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =      9249.930


 *****  ANSYS SOLUTION ROUTINE  *****

 PERFORM AN EXPANSION PASS
```

```
 NUMBER OF MODES TO EXPAND=     8
  CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   00:51:30  APR 11, 1996 CP=   9249.930
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX  UY  UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
     EXPANSION PASS . . . . . .ON
  NUMBER OF MODES TO EXPAND . . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                    L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY    COMPONENT
      ALL         ALL


*** NOTE ***                                CP=   9276.940   TIME= 00:52:31
Page file used.

  *** ELEMENT RESULT CALCULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45        9.130   0.004
    3    1560  SOLID45        5.560   0.004
    4     600  SOLID45        2.180   0.004
    5    2872  SOLID45       10.220   0.004
    6    1064  SOLID45        3.660   0.003

  *** NODAL LOAD CALCULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45        0.710   0.000
    3    1560  SOLID45        0.560   0.000
    4     600  SOLID45        0.170   0.000
    5    2872  SOLID45        0.820   0.000
    6    1064  SOLID45        0.330   0.000

*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
     106.109 MB WRITTEN ON RESULTS FILE: seism2.rst

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      9529.890


*****  ANSYS SOLUTION ROUTINE  *****
```

```
 PERFORM A SPECTRUM ANALYSIS
  THIS WILL BE A NEW ANALYSIS

 *** NOTE ***                                CP=   9529.890   TIME= 01:02:49
 Some analysis options have been reset to their defaults.  Please verify
  current settings or respecify as required.


 USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
  USE ALL MODES FROM THE MODAL ANALYSIS
  INCLUDE STRESS RESPONSES IN THE CALCULATIONS

 SEISMIC EXCITATION DIRECTION = 0.00000E+00  1.0000     0.00000E+00

 SPECTRUM TYPE KEY=  2  FACTOR=  1.00000

 FREQ= 0.100      100.     0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
 NUMBER OF FREQUENCIES IN TABLE =  2

 DAMPING= 0.00000E+00  SV=     16.285         16.285        0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00


 COMBINE MODES USING THE SRSS METHOD
  WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

 WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
   FOR ALL APPLICABLE ENTITIES

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism2.db
  FOR POSSIBLE RESUME FROM THIS POINT

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   01:03:17  APR 11, 1996 CP=   9543.100
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


                     S O L U T I O N   O P T I O N S

   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .SPECTRUM
      SPECTRUM TYPE. . . . . .SINGLE POINT
   NUMBER OF MODES TO BE USED. . . . . .     8
   ELEMENT RESULTS CALCULATION . . . . . .ON

                   L O A D   S T E P   O P T I O N S

   LOAD STEP NUMBER. . . . . .     1
   SPECTRUM LOADING TYPE . . . . . .ACCELERATION
   EXCITATION DIRECTION. . . . . .0.00000E+00  1.0000     0.00000E+00
   MODE COMBINATION TYPE . . . . . .SRSS
      SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
   PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
   DATABASE OUTPUT CONTROLS
      ITEM      FREQUENCY    COMPONENT
       ALL         ALL

1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   01:03:29  APR 11, 1996 CP=   9546.950
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844
```

21 PWR Tube Seismic Analysis With Backfill

SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07

SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

MODE	FREQUENCY	DAMPING	SV	MODE COEF.
1	21.91	0.0000	16.285	-0.3980E-03
2	24.64	0.0000	16.285	-0.3840E-03
3	29.00	0.0000	16.285	0.9750E-03
4	30.74	0.0000	16.285	0.3615E-01
5	34.38	0.0000	16.285	-0.6770E-03
6	35.91	0.0000	16.285	-0.7013E-03
7	38.79	0.0000	16.285	0.2195E-03
8	48.84	0.0000	16.285	-0.4132E-04

MODAL COMBINATION COEFFICIENTS

MODE=	1	FREQUENCY=	21.913	COUPLING COEF.=	1.000
MODE=	2	FREQUENCY=	24.639	COUPLING COEF.=	1.000
MODE=	3	FREQUENCY=	29.000	COUPLING COEF.=	1.000
MODE=	4	FREQUENCY=	30.743	COUPLING COEF.=	1.000
MODE=	5	FREQUENCY=	34.376	COUPLING COEF.=	1.000
MODE=	6	FREQUENCY=	35.912	COUPLING COEF.=	1.000
MODE=	7	FREQUENCY=	38.790	COUPLING COEF.=	1.000
MODE=	8	FREQUENCY=	48.843	COUPLING COEF.=	1.000

SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE seism2.mcom

*** PROBLEM STATISTICS
ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM = 37495
R.M.S. WAVEFRONT SIZE = 902.2

*** ANSYS BINARY FILE STATISTICS
BUFFER SIZE USED= 4096

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 9546.950

PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism2.db
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 1015
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

*** PAGE FILE USED ***
NUMBER OF R/W OPERATIONS= 788
MAXIMUM RECORD NUMBER = 599
RECORD SIZE (I*4 WORDS) = 16384
PAGE FILE SIZE (MB) = 37.438

ANSYS RUN COMPLETED

```
|                REV. 5.1   24                    HP 9000/7XX
|
|       CP TIME      (sec) =       9555.840       TIME  =  01:03:45
|       ELAPSED TIME (sec) =      16061.000       DATE  =  04/11/96
|
*-----------------------------------------------------------------*
```

```
*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
```

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AFTER YOU HAVE READ AND UNDERSTAND THE PREVIOUS DISCLAIMER,
PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postf2
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.170   TIME= 07:52:08
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postf2    07:52:08  APR 11, 1996 CP=      0.170

    1  resume,seism2,db
    2  /filnam,seism2
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /out,seism2,res
    7  /com, 100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
    8  /com,  90% Degradation of Inner Barrier
    9  /com,
   10  /com,
   11  /com, MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER
   12  /com,
   13  /com, No Outer Barrier
   14  !esel,s,type,,6,7
   15  !nsle
   16  !esln
   17  !set,1,5
   18  !nsort,s,int,0,0,1
   19  !prns,s,prin
   20
   21  /com,
   22  /com,
   23  /com, MAXIMUM STRESS INTENSITY IN THE INNER BARRIER
   24  /com,
   25  /com,
   26  esel,s,type,,5,6
   27  nsle
   28  esln
   29  nsort,s,int,0,0,1
   30  prns,s,prin
   31
   32  /com,
   33  /com,
   34  /com, MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES
   35  /com,
   36  /com,
   37  esel,s,type,,1
   38  esel,a,type,,3,4
   39  nsle
   40  esln
   41  nsort,s,int,0,0,1
   42  prns,s,prin
   43
   44  /com,
   45  /com,
   46  /com, MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES
   47  /com,
   48  /com,
   49  esel,s,type,,2
   50  nsle
```

```
   51  esln
   52  nsort,s,int,0,0,1
   53  prns,s,prin
   54
   55  /out
   56  fini
   57  /exit,nosave
   58  /eof

 RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

 /INPUT FILE= /ansys51/docu/start.ans  LINE=       0

 ABBREVIATION= REPLOT    /REPLOT

 PARAMETER PI       =     3.141593
    ***********************************************************
    ANSYS STARTUP FILE  start.ans
    ***********************************************************

 ABBREVIATION= VEC       /show,,,1,

 ABBREVIATION= RAS       /show,,,0,

 ABBREVIATION= INP       /input,,inp,

 ABBREVIATION= ESC       /exit,nosav,

 ABBREVIATION= K1        /pnum,kp  ,1,

 ABBREVIATION= K0        /pnum,kp  ,0,

 ABBREVIATION= L1        /pnum,line,1,

 ABBREVIATION= L0        /pnum,line,0,

 ABBREVIATION= A1        /pnum,area,1,

 ABBREVIATION= A0        /pnum,area,0,

 ABBREVIATION= V1        /pnum,volu,1,

 ABBREVIATION= V0        /pnum,volu,0,

 ABBREVIATION= N1        /pnum,node,1,

 ABBREVIATION= N0        /pnum,node,0,

 ABBREVIATION= E1        /pnum,elem,1,

 ABBREVIATION= E0        /pnum,elem,0,

 ABBREVIATION= M1        /pnum,mat ,1,

 ABBREVIATION= M0        /pnum,mat ,0,

 ABBREVIATION= R1        /pnum,real,1,

 ABBREVIATION= R0        /pnum,real,0,

 ABBREVIATION= T1        /pnum,type,1,

 ABBREVIATION= T0        /pnum,type,0,

 ABBREVIATION= C1        /number,1,

 ABBREVIATION= C0        /number,0,

 ABBREVIATION= PR1       /psf,pres,norm,1,
```

```
 ABBREVIATION= PRO       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ****************************************************************
    END  start.ans
    ****************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ****************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism2.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER       =      6
 ACTIVE COORDINATE SYSTEM             =      0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS      =   1196

 INITIAL JOBNAME = postf2
 CURRENT JOBNAME = postf2

 CURRENT JOBNAME REDEFINED AS seism2
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   07:52:14  APR 11, 1996 CP=      5.520
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


         ***** ANSYS RESULTS INTERPRETATION (POST1) *****


 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 *** NOTE ***                            CP=      7.150   TIME= 07:52:16
 Page file used.

 SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
   TIME/FREQUENCY=  34.376
```

```
 TITLE=  21 PWR Tube Seismic Analysis With Backfill

 /INPUT FILE= seism2.mcom  LINE=       0
 ANSYS REVISION  5.1              24    01:03:29    04/11/1996
  seism2.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.39797E-03

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                            CP=     31.260   TIME= 07:53:20
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.38398E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.38398E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.38398E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.97501E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.97501E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.97501E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.36155E-01

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.36155E-01 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.36155E-01 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.67697E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.67697E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.67697E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.70127E-03
```

```
LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.70127E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.70127E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism2.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.21951E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.21951E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.21951E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism2.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.41315E-04

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.41315E-04 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.41315E-04 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE

/OUTPUT FILE= seism2.res

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       109.870


EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        15592
MAXIMUM RECORD NUMBER   =          554
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       34.625

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|        CP TIME      (sec) =        109.880     TIME  =  07:56:38       |
|        ELAPSED TIME (sec) =        271.000     DATE  =  04/11/96       |
|                                                                        |
*------------------------------------------------------------------------*
```

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```
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 PRESS <CR> OR <ENTER> TO CONTINUE


         *****  ANSYS COMMAND LINE ARGUMENTS  *****
  INITIAL JOBNAME            = postlin2
  MEMORY REQUESTED (MB)      =     64.0
  BATCH MODE REQUESTED       = LIST
  START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.160   TIME= 08:23:36
There are no parameters and no abbreviations defined.

38303             VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postlin2  08:23:36  APR 11, 1996 CP=      0.160

    1  resume,seism2,db
    2  /filnam,seism2
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /com, Outer Barrier Stress Distribution
    7  !nsel,s,node,,13294
    8  !nsel,a,node,,13367
    9  !nsel,a,node,,12430
   10  !nsel,a,node,,12503
   11  !nsel,a,node,,7840
   12  !esln
   13  !lpath,7840,13294
   14  !/out,obstress
   15  /com, Outer Barrier Linearized Stresses at Location of Peak Stress
   16  !prsect
   17  !/out
   18  !/show,obdist,grph
   19  !plsect,s,int
   20  !/show,term
   21  /com, Inner Barrier Stress Distribution
   22  nsel,s,node,,12757
   23  nsel,a,node,,12765
   24  nsel,a,node,,12761
   25  esln
   26  lpath,12757,12761
   27  /out,ibstress
   28  /com, Inner Barrier Linearized Stresses at Location of Peak Stress
   29  prsect
   30  /out
   31  /show,ibdist,grph
   32  plsect,s,int
   33  /show,term
   34  /com, Basket Stress Distribution
   35  nsel,s,node,,6133
   36  nsel,a,node,,6194
   37  nsel,a,node,,6069
   38  esln
   39  lpath,6133,6069
   40  /out,bktstress
   41  /com, Basket Tubes and Guides Linearized Stresses at Location of Peak Stress
   42  prsect
   43  /out
   44  /show,bktdist,grph
   45  plsect,s,int
   46  /show,term
   47  /com, Criticality Control Plate Stress Distribution
   48  nsel,s,node,,3813
   49  nsel,a,node,,3938
   50  nsel,a,node,,3877
```

```
   51  esln
   52  lpath,3813,3877
   53  /out,pltstress
   54  /com, Criticality Control Plates Linearized Stresses at Location of Peak Stress
   55  prsect
   56  /out
   57  /show,pltdist,grph
   58  plsect,s,int
   59  /show,term
   60  fini
   61  /exit,nosave

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,
```

```
 ABBREVIATION= PR1       /psf,pres,norm,1,

 ABBREVIATION= PR0       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism2.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER        =       6
 ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS       =    1196

 INITIAL JOBNAME = postlin2
 CURRENT JOBNAME = postlin2

 CURRENT JOBNAME REDEFINED AS seism2
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   08:23:47  APR 11, 1996 CP=      5.680
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill

         ***** ANSYS RESULTS INTERPRETATION (POST1) *****

 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 *** NOTE ***                            CP=       7.260   TIME= 08:23:49
 Page file used.
```

```
 SET COMMAND GOT LOAD STEP=      1  SUBSTEP=      5  CUMULATIVE ITERATION=      5
   TIME/FREQUENCY=  34.376
 TITLE=  21 PWR Tube Seismic Analysis With Backfill

 /INPUT FILE= seism2.mcom  LINE=       0
 ANSYS REVISION  5.1              24    01:03:29    04/11/1996
  seism2.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      1  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.39797E-03

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                                CP=      32.680   TIME= 08:24:54
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      2  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.38398E-03

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR=-0.38398E-03 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR=-0.38398E-03 ABS=    0

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      3  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.97501E-03

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR= 0.97501E-03 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR= 0.97501E-03 ABS=    0

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      4  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.36155E-01

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR= 0.36155E-01 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR= 0.36155E-01 ABS=    0

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      5  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.67697E-03

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR=-0.67697E-03 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR=-0.67697E-03 ABS=    0

 LOAD CASE   1 IS LOAD STEP      1  SUBSTEP      6  COMPLEX=  0
 FILE= seism2.rst
  21 PWR Tube Seismic Analysis With Backfill
```

```
LOAD CASE   1 FACTOR SET TO-0.70127E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.70127E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.70127E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism2.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.21951E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.21951E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.21951E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism2.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.41315E-04

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.41315E-04 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.41315E-04 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE
 Outer Barrier Stress Distribution
 Outer Barrier Linearized Stresses at Location of Peak Stress
 Inner Barrier Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE   12757 TO    12757 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12765 TO    12765 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12761 TO    12761 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     8 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
     12757 12761

/OUTPUT FILE= ibstress

/SHOW SWITCH PLOTS TO FILE ibdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE ibdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Basket Stress Distribution

SELECT      FOR ITEM=NODE COMPONENT=
 IN RANGE    6133 TO     6133 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.
```

```
ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    6194 TO     6194 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    6069 TO     6069 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

    10 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      6133  6069

/OUTPUT FILE= bktstres

/SHOW SWITCH PLOTS TO FILE bktdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE bktdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Criticality Control Plate Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    3813 TO     3813 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    3938 TO     3938 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    3877 TO     3877 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     6 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      3813  3877

/OUTPUT FILE= pltstres

/SHOW SWITCH PLOTS TO FILE pltdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE pltdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED *****  CP =       104.790
```

```
EXIT ANSYS WITHOUT SAVING DATABASE

NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        14527
MAXIMUM RECORD NUMBER   =          529
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       33.063

*------------------------------------------------------------------------------*
|                                                                              |
|                           ANSYS RUN COMPLETED                                |
|                                                                              |
|------------------------------------------------------------------------------|
|                                                                              |
|              REV. 5.1   24                      HP 9000/7XX                  |
|                                                                              |
|       CP TIME      (sec) =        104.790       TIME  =  08:28:06            |
|       ELAPSED TIME (sec) =        271.000       DATE  =  04/11/96            |
|                                                                              |
*------------------------------------------------------------------------------*
```

```
/COM,ANSYS REVISION  5.1                24    01:03:29    04/11/1996
/COM, seism2.mcom
LCOPER,ZERO
LCDEFI,1,     1,     1
LCFACT,1, -0.397967E-03
LCASE,1
LCOPER,SQUARE
LCDEFI,1,     1,     2
LCFACT,1, -0.383981E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     3
LCFACT,1,  0.975010E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     4
LCFACT,1,  0.361549E-01
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     5
LCFACT,1, -0.676968E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     6
LCFACT,1, -0.701273E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     7
LCFACT,1,  0.219508E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     8
LCFACT,1, -0.413154E-04
LCOPER,ADD,1,MULT,1
LCOPER,SQRT
```

```
*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
```

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        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = seism4
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.250   TIME= 12:57:18
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism4    12:57:18  APR 10, 1996 CP=      0.250

    1  /com,*********************************************************************
    2  /com,*********************************************************************
    3  /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4  /com,*****  Degree of Degradation in Outer Barrier: 100%                   *****
    5  /com,*****  Degree of Degradation in Inner Barrier:  90%                   *****
    6  /com,*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
    7  /com,*****                                             Guides 50%         *****
    8  /com,*****                                             SS-B Plates 50%    *****
    9  /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
   10  /com,*****  Quarter Symmetry Model                                         *****
   11  /com,*********************************************************************
   12  /com,*********************************************************************
   13  /com,*********************************************************************
   14  /config,nvpag,512
   15  /units,si
   16  /prep7
   17  /title, 21 PWR Tube Seismic Analysis With Backfill
   18  /vcon,,0
   19  /com, Define Parameters
   20  ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   21  obir=0.71295            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   22  obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   23  obor=0.78095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   24  ts1=.0035                ! SS-B Plate Thickness
   25  ts2=.005                ! CS Tube Thickness
   26  ts3=.005                ! Corner Guide Thickness
   27  ts4=.005                ! End Guide Thickness
   28  egih=0.0855             ! End Guide Fin Inner Height(0.0809+0.005-2.5*tan10)
   29  pie=3.1415926           ! Pi
   30  ang1=30*pie/180         ! Angle on end of end guide
   31  ang2=80*pie/180         ! Angle on end of end guide fin
   32  ang3=58*pie/180         ! Angle on end of corner guide
   33  tw=0.2285               ! Tube Inner Side Width
   34  pos1=tw/2               ! Dimension to Keypoint Position 1
   35  pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   36  pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   37  pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   38  pos5=pos4+tw            ! Dimension to Keypoint Position 5
   39  pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   40  pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   41  pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   42  pos9=pos8+tw            ! Dimension to Keypoint Position 9
   43  pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   44  pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   45  posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   46  posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   47  poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   48  posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   49  posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   50  poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
```

```
51  poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
52  bkht=4.575/2                ! Basket Height (Half Height)
53  ibht=bkht+0.01              ! inner barrier cavity height
54  !bgh=ibht-bkht             ! Basket Gap Height
55  iblt=0.01                  ! inner lid height
56  elev1=ibht+iblt            ! Elevation of Top of Inner Barrier
57  ltlgh=0.030                ! Lid to Lid Gap Height
58  elev2=elev1+ltlgh          ! Elevation of Bottom of Upper Outer Barrier Lid
59  oblt=0.06                  ! outer lid height
60  elev3=elev2+oblt           ! Elevation of Top of Upper Outer Barrier Lid
61  stht=0.225                 ! skirt height
62  elev4=elev3+stht           ! Elevation of Top of Waste Package
63  elev5=-(iblt+oblt)         ! Elevation of Bottom of Lower Outer Barrier Lid
64  elev6=elev5-stht           ! Elevation of Bottom of Waste Package
65  /com, Line Divisions
66  shd=1              ! Skirt Height Divisions
67  obld=1             ! Outer Barrier Lid Divisions
68  gd=2               ! Gap Divisions
69  ibld=2             ! Inner Barrier Lid Divisions
70  bd=15              ! Basket Divisions
71  htwd=4             ! Half Tube Width Divisions
72  twd=4              ! Tube Width Divisions
73  thd=4              ! Tube Height Divisions
74  egfd=4             ! End Guide Fin Divisions
75  ptd=2              ! Plate Thickness Divisions
76  ttd=1              ! Tube Thickness Divisions
77  a1d=4              ! Arc 1 Divisions
78  a2d=4              ! Arc 2 Divisions
79  a3d=4              ! Arc 3 Divisions
80  a4d=4              ! Arc 4 Divisions
81  a5d=4              ! Arc 5 Divisions
82  a6d=4              ! Arc 6 Divisions
83  a7d=4              ! Arc 7 Divisions
84  a8d=4              ! Arc 8 Divisions
85  a9d=4              ! Arc 9 Divisions
86  ibtd=2             ! Inner Barrier Thickness Divisions
87  obitd=2            ! Outer Barrier Inner Thickness Divisions
88  std=2              ! Skirt Thickness Divisions
89  /com, Define Element Properties
90  et,1,solid45       ! Carbon Steel Tube
91  et,2,solid45       ! Stainless Steel - Boron Plate
92  et,3,solid45       ! Carbon Steel End Guide
93  et,4,solid45       ! Carbon Steel Corner Guide
94  et,5,solid45       ! Alloy 625 Inner Barrier
95  et,6,solid45       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
96  !et,6,solid45      ! A 516 Carbon Steel Outer Barrier
97  !et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
98  /com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
99  /com, Room Temperature Properties of Materials
100 mp,ex,1,206e9        ! A516 Carbon Steel Tube
101 mp,ex,2,195e9        ! 316B6A Stainless Steel - Boron Plate (316L Properties)
102 mp,ex,3,206e9        ! A516 Carbon Steel End Guide
103 mp,ex,4,206e9        ! A516 Carbon Steel Corner Guide
104 mp,ex,5,208e9        ! Alloy 625 Inner Barrier
105 mp,ex,6,208e9        ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
106 !mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
107 !mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
108 mp,nuxy,1,0.3        ! A516 Carbon Steel Tube
109 mp,nuxy,2,0.298      ! 316B6A Stainless Steel - Boron Plate (316 Properties)
110 mp,nuxy,3,0.3        ! A516 Carbon Steel End Guide
111 mp,nuxy,4,0.3        ! A516 Carbon Steel Corner Guide
112 mp,nuxy,5,0.278      ! Alloy 625 Inner Barrier
113 mp,nuxy,6,0.278      ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
114 !mp,nuxy,6,0.3        ! A516 Carbon Steel Outer Barrier
115 !mp,nuxy,7,0.3        ! A516 Carbon Steel Outer Barrier w/Backfill Weight
116 mp,dens,1,8131       ! A516 Carbon Steel Tube
117 mp,dens,2,178040.66  ! 316B6A Stainless Steel - Boron Plate (Adjusted to include tube, degraded plate, and SNF ma
118 mp,dens,3,16262      ! A516 Carbon Steel End Guide
119 mp,dens,4,16262      ! A516 Carbon Steel Corner Guide
120 mp,dens,5,8442       ! Alloy 625 Inner Barrier
```

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121 mp,dens,6,1101960   ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
122 !mp,dens,6,8131     ! A516 Carbon Steel Outer Barrier
123 !mp,mu,7,0.57       ! Coefficient of Friction (Steel on Steel Assumed)
124 !tb,biso,1
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
126 !tb,biso,2
127 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
128 !tb,biso,3
129 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
130 !tb,biso,4
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
132 !tb,biso,5
133 !tbdata,,379e6,1.271e9  ! Alloy 625
134 !tb,biso,6
135 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
136 !tb,biso,7
137 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
138 /com
139 /com, Define keypoints in the basket assembly
140 csys,0
141 k,1,0,0
142 k,2,pos1,0
143 k,3,pos2,0
144 k,4,pos3,0
145 k,5,pos4,0
146 k,6,pos5,0
147 k,7,pos6,0
148 k,8,pos7,0
149 k,9,pos8,0
150 k,10,pos9,0
151 k,11,pos10,0
152 k,12,pos11,0
153 k,13,pos1,pos1
154 k,14,pos4,pos1
155 k,15,pos5,pos1
156 k,16,pos8,pos1
157 k,17,pos9,pos1
158 k,18,pos2,pos2
159 k,19,pos3,pos2
160 k,20,pos6,pos2
161 k,21,pos7,pos2
162 k,22,pos10,pos2
163 k,23,pos11,posen
164 !k,24,posei,posen
165 csys,1
166 k,24,ibir,(180/pie)*atan(posen/posei)
167 csys,0
168 k,25,pos3,pos3
169 k,26,pos6,pos3
170 k,27,pos7,pos3
171 k,28,pos10,pos3
172 k,29,pos11,posef
173 !k,30,poseo,posef
174 csys,1
175 k,30,ibir,(180/pie)*atan(posef/poseo)
176 csys,0
177 k,31,pos4,pos4
178 k,32,pos5,pos4
179 k,33,pos8,pos4
180 k,34,pos9,pos4
181 k,35,pos5,pos5
182 k,36,pos8,pos5
183 k,37,pos9,pos5
184 !k,38,pos11,poseg
185 csys,1
186 k,38,ibir,(180/pie)*atan(poseg/pos11)
187 csys,0
188 k,39,pos6,pos6
189 k,40,pos7,pos6
190 !k,41,pos10,pos6
```

```
191 csys,1
192 k,41,ibir,(180/pie)*atan(pos6/pos10)
193 csys,0
194 k,42,posg,posg
195 !k,43,poscg,posg
196 csys,1
197 k,43,ibir,(180/pie)*atan(posg/poscg)
198 k,44,ibir,0
199 k,45,ibir,45
200 k,46,obir,0
201 k,47,obir,(180/pie)*atan(posen/posei)
202 k,48,obir,(180/pie)*atan(posef/poseo)
203 k,49,obir,(180/pie)*atan(poseg/pos11)
204 k,50,obir,(180/pie)*atan(pos6/pos10)
205 k,51,obir,(180/pie)*atan(posg/poscg)
206 k,52,obir,45
207 k,53,obsr,0
208 k,54,obsr,(180/pie)*atan(posen/posei)
209 k,55,obsr,(180/pie)*atan(posef/poseo)
210 k,56,obsr,(180/pie)*atan(poseg/pos11)
211 k,57,obsr,(180/pie)*atan(pos6/pos10)
212 k,58,obsr,(180/pie)*atan(posg/poscg)
213 k,59,obsr,45
214 k,60,obor,0
215 k,61,obor,(180/pie)*atan(posen/posei)
216 k,62,obor,(180/pie)*atan(posef/poseo)
217 k,63,obor,(180/pie)*atan(poseg/pos11)
218 k,64,obor,(180/pie)*atan(pos6/pos10)
219 k,65,obor,(180/pie)*atan(posg/poscg)
220 k,66,obor,45
221 local,11,0,0,0,0,45,0,0,
222 ksymm,y,all,,,0,0,0
223 nummrg,kp
224 csys,0
225 ksymm,y,all,,,0,0,0
226 nummrg,kp
227 kdel,2,12,1
228 k,1001,0,0,bkht
229 l,1,1001              ! Line 1 for VDRAG of Basket
230 lesize,all,,,bd,.2,0
231 k,2001,0,0,ibht
232 l,1001,2001          ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
233 lesize,all,,,gd,1,0
234 k,3001,0,0,elev1
235 l,2001,3001          ! Line 3 for VDRAG of Inner Barrier Upper Lid
236 lesize,all,,,ibld,1,0
237 k,4001,0,0,elev2
238 l,3001,4001          ! Line 4 for VDRAG of Lid to Lid Gap
239 lesize,all,,,gd,1,0
240 k,5001,0,0,elev3
241 l,4001,5001          ! Line 5 for VDRAG of Outer Barrier Upper Lid
242 lesize,all,,,obld,1,0
243 k,6001,0,0,elev4
244 l,5001,6001          ! Line 6 for VDRAG of Upper Skirt
245 lesize,all,,,shd,1,0
246 k,7001,0,0,-iblt
247 l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
248 lesize,all,,,ibld,1,0
249 k,8001,0,0,elev5
250 l,7001,8001          ! Line 8 for VDRAG of OB Lower Lid
251 lesize,all,,,obld,1,0
252 k,9001,0,0,elev6
253 l,8001,9001          ! Line 9 for VDRAG of Lower Skirt
254 lesize,all,,,shd,1,0
255 /com, line set 1 Tube Width for Half Tubes on Symmetry Plane
256 L,     197,     206  ! Line 10
257 L,     196,     205
258 L,     195,     201
259 L,     194,     200
260 L,     193,     204
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 261  L,      192,      203
 262  L,      191,      199
 263  L,      190,      198
 264  L,      189,      202
 265  L,      188,      138
 266  L,      187,      133  ! 20
 267  L,       68,       13
 268  L,       69,       18
 269  L,       70,       85
 270  L,       71,       80
 271  L,       72,       81
 272  L,       73,       86
 273  L,       74,       87
 274  L,       75,       82
 275  L,       76,       83
 276  L,       77,       88  ! 30
 277  L,       78,       89
 278  lesize,all,,,htwd,1,0
 279  /com, line set 2 Tube Widths
 280  L,      211,      218
 281  L,      210,      220
 282  L,      215,      217
 283  L,      214,      216
 284  L,      209,      219
 285  L,      208,      159
 286  L,      213,      155
 287  L,      151,      152
 288  L,      145,      146  ! 40
 289  L,      139,      140
 290  L,      134,      135
 291  L,       14,       15
 292  L,       19,       20
 293  L,       25,       26
 294  L,       31,       32
 295  L,       98,       35
 296  L,       92,       39
 297  L,       93,      106
 298  L,       99,      102  ! 50
 299  L,      100,      103
 300  L,       94,      107
 301  L,       95,      104
 302  lesize,all,,,twd,1,0
 303  /com, line set 3 Tube Widths on End Column
 304  L,      162,      163
 305  L,      160,      161
 306  L,      156,      157
 307  L,      153,      154
 308  L,      147,      148
 309  L,      141,      142
 310  L,      136,      137  ! 60
 311  L,       16,       17
 312  L,       21,       22
 313  L,       27,       28
 314  L,       33,       34
 315  L,       36,       37
 316  L,       40,       41
 317  L,       42,       43
 318  lesize,all,,,twd,1,0
 319  /com, line set 4 Tube Heights
 320  L,      201,      200
 321  L,      205,      204
 322  L,      210,      209  ! 70
 323  L,      215,      214
 324  L,      217,      216
 325  L,      220,      219
 326  L,      221,      162
 327  L,      199,      198
 328  L,      203,      202
 329  L,      208,      145
 330  L,      213,      151
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 331  L,      155,      152
 332  L,      159,      146  ! 80
 333  L,      160,      147
 334  L,      156,      153
 335  L,      157,      154
 336  L,      161,      148
 337  L,      133,       13
 338  L,      138,       18
 339  L,      139,       19
 340  L,      134,       14
 341  L,      135,       15
 342  L,      140,       20  ! 90
 343  L,      141,       21
 344  L,      136,       16
 345  L,      137,       17
 346  L,      142,       22
 347  L,      143,       23
 348  L,       80,       81
 349  L,       85,       86
 350  L,       25,       92
 351  L,       31,       98
 352  L,       32,       35  ! 100
 353  L,       26,       39
 354  L,       27,       40
 355  L,       33,       36
 356  L,       34,       37
 357  L,       28,       41
 358  L,       29,       38
 359  L,       82,       83
 360  L,       87,       88
 361  L,       93,       94
 362  L,       99,      100  ! 110
 363  L,      102,      103
 364  L,      106,      107
 365  L,       42,      109
 366  L,      158,      149
 367  lesize,all,,,thd,1,0
 368  /com, line set 5 End Guide Fins
 369  L,      207,      206
 370  L,      212,      211
 371  L,      150,      149
 372  L,      144,      143
 373  L,       24,       23
 374  L,       30,       29  ! 120
 375  L,       96,       95
 376  L,       90,       89
 377  lesize,all,,,egfd,1,0
 378  /com, line set 6 SS-B Plate Thickness
 379  L,      197,      196
 380  L,      206,      205
 381  L,      211,      210
 382  L,      207,      212
 383  L,      206,      211
 384  L,      205,      210
 385  L,      218,      220
 386  L,      220,      221  ! 130
 387  L,      193,      192
 388  L,      204,      203
 389  L,      209,      208
 390  L,      204,      209
 391  L,      203,      208
 392  L,      219,      159
 393  L,      162,      160
 394  L,      163,      161
 395  L,      161,      158
 396  L,      219,      162  ! 140
 397  L,      159,      160
 398  L,      189,      188
 399  L,      202,      138
 400  L,      145,      139
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401  L,     202,     145
402  L,     138,     139
403  L,     146,     140
404  L,     147,     141
405  L,     146,     147
406  L,     140,     141  ! 150
407  L,     148,     142
408  L,     149,     143
409  L,     148,     149
410  L,     142,     143
411  L,     150,     144
412  L,      69,      70
413  L,      18,      85
414  L,      19,      25
415  L,      18,      19
416  L,      85,      25  ! 160
417  L,      20,      26
418  L,      21,      27
419  L,      20,      21
420  L,      26,      27
421  L,      22,      28
422  L,      22,      23
423  L,      28,      29
424  L,      23,      29
425  L,      24,      30
426  L,      73,      74  ! 170
427  L,      86,      87
428  L,      92,      93
429  L,      86,      92
430  L,      87,      93
431  L,      39,     106
432  L,      40,      42
433  L,      39,      40
434  L,     106,      42
435  L,      38,      41
436  L,      41,      43  ! 180
437  L,      77,      78
438  L,      88,      89
439  L,      94,      95
440  L,      88,      94
441  L,      89,      95
442  L,      90,      96
443  L,     109,     107
444  L,     107,     104
445  L,     224,     225
446  L,     230,     231  ! 190
447  L,     236,     237
448  L,     226,     227
449  L,     227,     228
450  L,     232,     233
451  L,     233,     234
452  L,     238,     239
453  L,     239,     240
454  L,     171,     170
455  L,     170,     169
456  L,     178,     177  ! 200
457  L,     177,     176
458  L,     185,     184
459  L,     184,     183
460  L,     168,     167
461  L,     175,     174
462  L,     182,     181
463  L,      47,      48
464  L,      54,      55
465  L,      61,      62
466  L,      49,      50  ! 210
467  L,      50,      51
468  L,      56,      57
469  L,      57,      58
470  L,      63,      64
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471  L,      64,      65
472  L,     117,     116
473  L,     116,     115
474  L,     124,     123
475  L,     123,     122
476  L,     131,     130  ! 220
477  L,     130,     129
478  L,     114,     113
479  L,     121,     120
480  L,     128,     127
481  lesize,all,,,ptd,1,0
482  /com, line set 7 tube thickness
483  L,     196,     195
484  L,     205,     201
485  L,     204,     200
486  L,     193,     194
487  L,     210,     215
488  L,     220,     217  ! 230
489  L,     219,     216
490  L,     209,     214
491  L,     192,     191
492  L,     203,     199
493  L,     202,     198
494  L,     189,     190
495  L,     208,     213
496  L,     159,     155
497  L,     146,     152
498  L,     145,     151  ! 240
499  L,     160,     156
500  L,     161,     157
501  L,     148,     154
502  L,     147,     153
503  L,     188,     187
504  L,     138,     133
505  L,      18,      13
506  L,      69,      68
507  L,     139,     134
508  L,     140,     135  ! 250
509  L,      20,      15
510  L,      19,      14
511  L,     141,     136
512  L,     142,     137
513  L,      22,      17
514  L,      21,      16
515  L,      70,      71
516  L,      85,      80
517  L,      86,      81
518  L,      73,      72  ! 260
519  L,      25,      31
520  L,      26,      32
521  L,      39,      35
522  L,      92,      98
523  L,      27,      33
524  L,      28,      34
525  L,      41,      37
526  L,      40,      36
527  L,      74,      75
528  L,      87,      82  ! 270
529  L,      88,      83
530  L,      77,      76
531  L,      93,      99
532  L,     106,     102
533  L,     107,     103
534  L,      94,     100
535  lesize,all,,,ttd,1,0
536  csys,1
537  /com, line set 8, arc 1 bottom
538  L,     222,     207
539  L,     223,     224
540  L,     229,     230
```

```
541 L,      235,      236  ! 280
542 lesize,all,,,a1d,1,0
543 /com, line set 9, arc 2 side arcs
544 L,      212,      218
545 L,      225,      226
546 L,      231,      232
547 L,      237,      238
548 lesize,all,,,a2d,1,0
549 /com, line set 10, arc 3 side arcs
550 L,      221,      163
551 L,      228,      171
552 L,      234,      178
553 L,      240,      185
554 lesize,all,,,a3d,1,0
555 /com, line set 11, arc 4 side arcs
556 L,      158,      150
557 L,      169,      168  ! 290
558 L,      176,      175
559 L,      183,      182
560 lesize,all,,,a4d,1,0
561 /com, line set 12, arc 5 side arcs
562 L,      144,       24
563 L,      167,       47
564 L,      174,       54
565 L,      181,       61
566 lesize,all,,,a5d,1,0
567 /com, line set 13, arc 6 side arcs
568 L,       30,       38
569 L,       48,       49
570 L,       55,       56
571 L,       62,       63  ! 300
572 lesize,all,,,a6d,1,0
573 /com, line set 14, arc 7 side arcs
574 L,       43,      109
575 L,       51,      117
576 L,       58,      124
577 L,       65,      131
578 lesize,all,,,a7d,1,0
579 /com, line set 15, arc 8 side arcs
580 L,      104,       96
581 L,      115,      114
582 L,      122,      121
583 L,      129,      128
584 lesize,all,,,a8d,1,0
585 /com, line set 16, arc 9 top arcs
586 L,       90,      110
587 L,      113,      112  ! 310
588 L,      120,      119
589 L,      127,      126
590 lesize,all,,,a9d,1,0
591 csys,0
592 /com, line set 17 IB thickness
593 L,      222,      223
594 L,      207,      224
595 L,      212,      225
596 L,      218,      226
597 L,      220,      227
598 L,      221,      228
599 L,      163,      171
600 L,      161,      170  ! 320
601 L,      158,      169
602 L,      150,      168
603 L,      144,      167
604 L,       24,       47
605 L,       30,       48
606 L,       38,       49
607 L,       41,       50
608 L,       43,       51
609 L,      109,      117
610 L,      107,      116  ! 330
```

```
611 L,      104,      115
612 L,       96,      114
613 L,       90,      113
614 L,      110,      112
615 lesize,all,,,ibtd,1,0
616 /com, line set 18 OB inner thickness
617 L,      223,      229
618 L,      224,      230
619 L,      225,      231
620 L,      226,      232
621 L,      227,      233
622 L,      228,      234  ! 340
623 L,      171,      178
624 L,      170,      177
625 L,      169,      176
626 L,      168,      175
627 L,      167,      174
628 L,       47,       54
629 L,       48,       55
630 L,       49,       56
631 L,       50,       57
632 L,       51,       58  ! 350
633 L,      117,      124
634 L,      116,      123
635 L,      115,      122
636 L,      114,      121
637 L,      113,      120
638 L,      112,      119
639 lesize,all,,,obitd,1,0
640 /com, line set 19 skirt thickness
641 L,      229,      235
642 L,      230,      236
643 L,      231,      237
644 L,      232,      238  ! 360
645 L,      233,      239
646 L,      234,      240
647 L,      178,      185
648 L,      177,      184
649 L,      176,      183
650 L,      175,      182
651 L,      174,      181
652 L,       54,       61
653 L,       55,       62
654 L,       56,       63  ! 370
655 L,       57,       64
656 L,       58,       65
657 L,      124,      131
658 L,      123,      130
659 L,      122,      129
660 L,      121,      128
661 L,      120,      127
662 L,      119,      126
663 lesize,all,,,std,1,0
664 /com, lines to fill in lids
665 /com, lines tube height
666 l,195,194            ! 379
667 l,191,190            ! 380
668 l,187,68             ! 381
669 l,71,72              ! 382
670 l,75,76              ! 383
671 lesize,all,,,thd,1,0
672 /com, end lines
673 l,222,197            ! 384
674 l,78,110             ! 385
675 lesize,all,,,egfd,1,0
676 /com, area set 1, tubes
677 a,195,196,205,201
678 a,200,201,205,204
679 a,193,194,200,204
680 a,191,192,203,199
```

```
a,198,199,203,202
a,189,190,198,202
a,187,188,138,133
a,133,138,18,13
a,69,68,13,18
a,71,70,85,80
a,80,85,86,81
a,73,72,81,86
a,75,74,87,82
a,82,87,88,83
a,77,76,83,88
a,209,210,215,214
a,215,210,220,217
a,216,217,220,219
a,209,214,216,219
a,145,208,213,151
a,213,208,159,155
a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
```

```
a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
a,159,219,162,160
a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
!a,223,229,230,224
!a,224,230,231,225
!a,225,231,232,226
!a,226,232,233,227
!a,227,233,234,228
!a,228,234,178,171
!a,171,178,177,170
!a,170,177,176,169
!a,169,176,175,168
!a,168,175,174,167
!a,167,174,54,47
!a,47,54,55,48
!a,48,55,56,49
!a,49,56,57,50
!a,50,57,58,51
!a,51,58,124,117
!a,117,124,123,116
!a,116,123,122,115
!a,115,122,121,114
!a,114,121,120,113
!a,113,120,119,112
!a,229,235,236,230
!a,236,237,231,230
!a,231,237,238,232
!a,238,239,233,232
```

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!a,239,240,234,233
!a,240,185,178,234
!a,185,184,177,178
!a,184,183,176,177
!a,176,183,182,175
!a,175,182,181,174
!a,174,181,61,54
!a,54,61,62,55
!a,55,62,63,56
!a,56,63,64,57
!a,57,64,65,58
!a,58,65,131,124
!a,124,131,130,123
!a,123,130,129,122
!a,122,129,128,121
!a,121,128,127,120
!a,120,127,126,119
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.01
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,0.01
nummrg,kp
/com, generate lines to fill in lid at top of WP
/com, lines tube height
L,414,421  ! 1121
L,422,429  ! 1124
L,430,437  ! 1125
L,438,445  ! 1131
L,446,453  ! 1138
lesize,all,,,thd,1,0
/com, end lines
L,370,518  ! 1141
L,539,413  ! 1151
lesize,all,,,egfd,1,0
al,832,1116,1120,1141
al,936,937,941,1121
al,946,947,951,1124
al,956,959,961,1125
al,966,969,971,1131
al,976,979,981,1138
al,932,1143,1147,1151
al,842,1122,1123
al,985,989,990,993
al,997,1001,1002,1005
al,1010,1013,1015,1018
al,1021,1025,1028,1029
al,1033,1037,1040,1041
al,922,1144,1148
al,857,1153,1156
al,1046,1049,1051,1054
al,1058,1061,1063,1066
al,1070,1073,1075,1078
al,907,1159,1163
al,872,1126,1130
al,882,1132,1133,1137
al,892,1139,1140
asel,s,loc,z,ibht+0.01
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
!asel,s,loc,z,elev1+0.015
!csys,1
!asel,r,loc,x,obir,obor
```

```
!csys,0
!vdrag,all,,,,,,4          ! Drag Lid to Lid Gap
!asel,s,loc,z,elev1+0.015
!asel,r,loc,z,elev1-0.015
!csys,1
!asel,r,loc,x,0,obir
!csys,0
!agen,2,all,,,,,ltlgh
!nummrg,kp
!asel,s,loc,z,elev2+0.015
!vdrag,all,,,,,,5          ! Drag Outer Barrier Upper Lid
!asel,s,loc,z,elev3
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,6          ! Drag Upper Skirt
/com, lines at bottom lid used to be here
!al,10,115,277,384
!al,12,13,68,379
!al,16,17,75,380
!al,20,21,85,381
!al,24,25,96,382
!al,28,29,107,383
!al,31,122,309,385
!al,32,116,281
!al,34,35,71,72
!al,38,39,78,79
!al,42,43,88,89
!al,46,47,99,100
!al,50,51,110,111
!al,53,121,305
!al,54,74,285
!al,56,57,82,83
!al,60,61,92,93
!al,64,65,103,104
!al,67,113,301
!al,114,117,289
!al,95,118,119,293
!al,106,120,297
!asel,s,loc,z,0
!vdrag,all,,,,,,7          ! Drag Inner Barrier Lower Lid
!csys,0
!asel,s,loc,z,-iblt
!vdrag,all,,,,,,8          ! Drag Outer Barrier Lower Lid
!asel,s,loc,z,elev5
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
!vsel,s,volu,,1,47
!type,1
!mat,1
!vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
```

```
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,0,elev1
csys,1
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
vsel,u,loc,x,ibir-0.02,obir
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,loc,x,obir,obor
vsel,r,loc,z,-iblt,elev1
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Upper Inner Barrier Adding Backfill Mass
vsel,inve
csys,1
vsel,u,loc,x,obir,obor
vsel,r,loc,z,0,elev1
vsel,u,volu,,1,92
csys,0
type,6
mat,6
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
!vsel,inve
!vsel,u,volu,,1,92
!csys,1
!vsel,u,loc,x,obir,obor
!vsel,a,loc,y,-90,5
!vsel,u,volu,,1,92
!vsel,u,type,,5
!type,6
!mat,6
!vmesh,all
/com, mesh upper outer barrier adding backfill mass
!vsel,inve
!vsel,u,type,,1,5
!type,7
!mat,7
!vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
nsel,s,loc,z,0
dsym,symm,z,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(7*bkht/bd),(10*bkht/bd)+0.02
nsel,r,loc,x,obir-0.001,obir+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini
```

```
 1031
 1032  /sol
 1033  expass,on
 1034  mxpand,8,,,yes
 1035  solve
 1036  fini
 1037
 1038  /sol
 1039  antype,spectr
 1040  spopt,sprs,,on
 1041  sed,,1
 1042  svtyp,2
 1043  freq,0.1,100
 1044  sv,,16.285,16.285
 1045  mcomb,srss,1e-8
 1046  outres,all,1
 1047  save
 1048  solve
 1049  fini
 1050  /exit
 1051  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=  .     0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI        =     3.141593
   ***********************************************************************
   ANSYS STARTUP FILE  start.ans
   ***********************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,
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```
ABBREVIATION= RO        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= TO        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= CO        /number,0,

ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ***********************************************************************
   END  start.ans
   ***********************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ***********************************************************************
**************************************************************************
**************************************************************************
*****  Seismic Analysis of 21 PWR Waste Package Under Degradation      *****
*****  Degree of Degradation in Outer Barrier: 100%                    *****
*****  Degree of Degradation in Inner Barrier:  90%                    *****
*****  Degree of Degradation in Basket Assembly:  Tubes 100%           *****
*****                                             Guides 50%           *****
*****                                             SS-B Plates 50%      *****
*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
*****  Quarter Symmetry Model                                          *****
**************************************************************************
**************************************************************************
**************************************************************************


NUMBER OF DATA BASE PAGES IN MEMORY      (NVPAGE)=       512

SI UNITS SPECIFIED FOR INTERNAL
 LENGTH          (l)  = METER(M)
 MASS            (M)  = KILOGRAM(KG)
 TIME            (t)  = SECOND(SEC)
 TEMPERATURE     (T)  = KELVIN(K)
 TOFFSET              = 0.0 KELVIN
 CHARGE          (Q)  = COULOMB
 CURRENT         (i)  = AMPERE (COULOMBS/SEC)
 FORCE           (f)  = NEWTON(N) (KG-M/SEC2)
 PRESSURE             = PASCAL (NEWTON/M**2)
 ENERGY          (W)  = JOULE (N-M)
 POWER           (P)  = WATT (N-M/SEC)
 CAPACITANCE     (C)  = FARAD
 INDUCTANCE      (L)  = HENRY
 MAGNETIC FLUX        = WEBER
 RESISTANCE      (R)  = OHM
 ELECTRIC POTENTIAL = VOLT

 INPUT UNITS ARE ALSO SET TO SI
```

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 12:57:19 APR 10, 1996 CP= 0.470
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

***** ANSYS ANALYSIS DEFINITION (PREP7) *****

TITLE=
21 PWR Tube Seismic Analysis With Backfill

VIEW CONE ANGLE FOR WINDOW 1 0.00
Define Parameters

PARAMETER IBIR = 0.7109500

PARAMETER OBIR = 0.7129500

PARAMETER OBSR = 0.7709500

PARAMETER OBOR = 0.7809500

PARAMETER TS1 = 0.3500000E-02

PARAMETER TS2 = 0.5000000E-02

PARAMETER TS3 = 0.5000000E-02

PARAMETER TS4 = 0.5000000E-02

PARAMETER EGIH = 0.8550000E-01

PARAMETER PIE = 3.141593

PARAMETER ANG1 = 0.5235988

PARAMETER ANG2 = 1.396263

PARAMETER ANG3 = 1.012291

PARAMETER TW = 0.2285000

PARAMETER POS1 = 0.1142500

PARAMETER POS2 = 0.1192500

PARAMETER POS3 = 0.1227500

PARAMETER POS4 = 0.1277500

PARAMETER POS5 = 0.3562500

PARAMETER POS6 = 0.3612500

PARAMETER POS7 = 0.3647500

PARAMETER POS8 = 0.3697500

PARAMETER POS9 = 0.5982500

PARAMETER POS10 = 0.6032500

PARAMETER POS11 = 0.6082500

PARAMETER POSG = 0.3662500

PARAMETER POSEI = 0.6937500

PARAMETER POSEO = 0.6928684

PARAMETER POSEN = 0.1185000

PARAMETER POSEF = 0.1235000

PARAMETER POSEG = 0.3525897

PARAMETER POSCG = 0.6001257

PARAMETER BKHT = 2.287500

PARAMETER IBHT = 2.297500

PARAMETER IBLT = 0.1000000E-01

PARAMETER ELEV1 = 2.307500

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 2.337500

PARAMETER OBLT = 0.6000000E-01

PARAMETER ELEV3 = 2.397500

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 2.622500

PARAMETER ELEV5 = -0.7000000E-01

PARAMETER ELEV6 = -0.2950000
Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 2.000000

PARAMETER IBLD = 2.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 2.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

PARAMETER A3D = 4.000000

PARAMETER A4D = 4.000000

PARAMETER A5D = 4.000000

PARAMETER A6D = 4.000000

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 PARAMETER A7D      =      4.000000

 PARAMETER A8D      =      4.000000

 PARAMETER A9D      =      4.000000

 PARAMETER IBTD     =      2.000000

 PARAMETER OBITD    =      2.000000

 PARAMETER STD      =      2.000000
  Define Element Properties

 ELEMENT TYPE     1 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     2 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     3 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     4 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     5 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE     6 IS SOLID45       3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL
  ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
  Room Temperature Properties of Materials

 MATERIAL    1          EX   =  0.2060000E+12

 MATERIAL    2          EX   =  0.1950000E+12

 MATERIAL    3          EX   =  0.2060000E+12

 MATERIAL    4          EX   =  0.2060000E+12

 MATERIAL    5          EX   =  0.2080000E+12

 MATERIAL    6          EX   =  0.2080000E+12

 MATERIAL    1          NUXY =  0.3000000

 MATERIAL    2          NUXY =  0.2980000

 MATERIAL    3          NUXY =  0.3000000
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 MATERIAL    4          NUXY =   0.3000000
 MATERIAL    5          NUXY =   0.2780000
 MATERIAL    6          NUXY =   0.2780000
 MATERIAL    1          DENS =    8131.000
 MATERIAL    2          DENS =    178040.7
 MATERIAL    3          DENS =    16262.00
 MATERIAL    4          DENS =    16262.00
 MATERIAL    5          DENS =    8442.000
 MATERIAL    6          DENS =    1101960.
  Define keypoints in the basket assembly
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT      1   X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      2   X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      3   X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      4   X,Y,Z=  0.122750      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      5   X,Y,Z=  0.127750      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      6   X,Y,Z=  0.356250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      7   X,Y,Z=  0.361250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      8   X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      9   X,Y,Z=  0.369750      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT     10   X,Y,Z=  0.598250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT     11   X,Y,Z=  0.603250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT     12   X,Y,Z=  0.608250      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT     13   X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
 KEYPOINT     14   X,Y,Z=  0.127750      0.114250      0.000000E+00  IN CSYS=  0
 KEYPOINT     15   X,Y,Z=  0.356250      0.114250      0.000000E+00  IN CSYS=  0
 KEYPOINT     16   X,Y,Z=  0.369750      0.114250      0.000000E+00  IN CSYS=  0
 KEYPOINT     17   X,Y,Z=  0.598250      0.114250      0.000000E+00  IN CSYS=  0
 KEYPOINT     18   X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     19   X,Y,Z=  0.122750      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     20   X,Y,Z=  0.361250      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     21   X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     22   X,Y,Z=  0.603250      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     23   X,Y,Z=  0.608250      0.118500      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

```
KEYPOINT     24  X,Y,Z=  0.710950       9.69319       0.000000E+00  IN CSYS=  1
                      0.700800      0.119704      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     0  (CARTESIAN)
KEYPOINT     25  X,Y,Z=  0.122750      0.122750      0.000000E+00  IN CSYS=  0
KEYPOINT     26  X,Y,Z=  0.361250      0.122750      0.000000E+00  IN CSYS=  0
KEYPOINT     27  X,Y,Z=  0.364750      0.122750      0.000000E+00  IN CSYS=  0
KEYPOINT     28  X,Y,Z=  0.603250      0.122750      0.000000E+00  IN CSYS=  0
KEYPOINT     29  X,Y,Z=  0.608250      0.123500      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     1  (CYLINDRICAL)
KEYPOINT     30  X,Y,Z=  0.710950       10.1065       0.000000E+00  IN CSYS=  1
                      0.699918      0.124757      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     0  (CARTESIAN)
KEYPOINT     31  X,Y,Z=  0.127750      0.127750      0.000000E+00  IN CSYS=  0
KEYPOINT     32  X,Y,Z=  0.356250      0.127750      0.000000E+00  IN CSYS=  0
KEYPOINT     33  X,Y,Z=  0.369750      0.127750      0.000000E+00  IN CSYS=  0
KEYPOINT     34  X,Y,Z=  0.598250      0.127750      0.000000E+00  IN CSYS=  0
KEYPOINT     35  X,Y,Z=  0.356250      0.356250      0.000000E+00  IN CSYS=  0
KEYPOINT     36  X,Y,Z=  0.369750      0.356250      0.000000E+00  IN CSYS=  0
KEYPOINT     37  X,Y,Z=  0.598250      0.356250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     1  (CYLINDRICAL)
KEYPOINT     38  X,Y,Z=  0.710950       30.1000       0.000000E+00  IN CSYS=  1
                      0.615080      0.356549      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     0  (CARTESIAN)
KEYPOINT     39  X,Y,Z=  0.361250      0.361250      0.000000E+00  IN CSYS=  0
KEYPOINT     40  X,Y,Z=  0.364750      0.361250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     1  (CYLINDRICAL)
KEYPOINT     41  X,Y,Z=  0.710950       30.9148       0.000000E+00  IN CSYS=  1
                      0.609947      0.365260      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     0  (CARTESIAN)
KEYPOINT     42  X,Y,Z=  0.366250      0.366250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO     1  (CYLINDRICAL)
KEYPOINT     43  X,Y,Z=  0.710950       31.3953       0.000000E+00  IN CSYS=  1
                      0.606863      0.370362      0.000000E+00  IN CSYS=  0
KEYPOINT     44  X,Y,Z=  0.710950      0.000000E+00  0.000000E+00  IN CSYS=  1
                      0.710950      0.000000E+00  0.000000E+00  IN CSYS=  0
```

KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0
KEYPOINT 46 X,Y,Z= 0.712950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.712950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 47 X,Y,Z= 0.712950 9.69319 0.000000E+00 IN CSYS= 1
0.702772 0.120041 0.000000E+00 IN CSYS= 0
KEYPOINT 48 X,Y,Z= 0.712950 10.1065 0.000000E+00 IN CSYS= 1
0.701887 0.125108 0.000000E+00 IN CSYS= 0
KEYPOINT 49 X,Y,Z= 0.712950 30.1000 0.000000E+00 IN CSYS= 1
0.616810 0.357552 0.000000E+00 IN CSYS= 0
KEYPOINT 50 X,Y,Z= 0.712950 30.9148 0.000000E+00 IN CSYS= 1
0.611662 0.366288 0.000000E+00 IN CSYS= 0
KEYPOINT 51 X,Y,Z= 0.712950 31.3953 0.000000E+00 IN CSYS= 1
0.608570 0.371403 0.000000E+00 IN CSYS= 0
KEYPOINT 52 X,Y,Z= 0.712950 45.0000 0.000000E+00 IN CSYS= 1
0.504132 0.504132 0.000000E+00 IN CSYS= 0
KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 54 X,Y,Z= 0.770950 9.69319 0.000000E+00 IN CSYS= 1
0.759944 0.129807 0.000000E+00 IN CSYS= 0
KEYPOINT 55 X,Y,Z= 0.770950 10.1065 0.000000E+00 IN CSYS= 1
0.758987 0.135285 0.000000E+00 IN CSYS= 0
KEYPOINT 56 X,Y,Z= 0.770950 30.1000 0.000000E+00 IN CSYS= 1
0.666989 0.386639 0.000000E+00 IN CSYS= 0
KEYPOINT 57 X,Y,Z= 0.770950 30.9148 0.000000E+00 IN CSYS= 1
0.661423 0.396086 0.000000E+00 IN CSYS= 0
KEYPOINT 58 X,Y,Z= 0.770950 31.3953 0.000000E+00 IN CSYS= 1
0.658078 0.401618 0.000000E+00 IN CSYS= 0
KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0
KEYPOINT 60 X,Y,Z= 0.780950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.780950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 61 X,Y,Z= 0.780950 9.69319 0.000000E+00 IN CSYS= 1
0.769801 0.131490 0.000000E+00 IN CSYS= 0
KEYPOINT 62 X,Y,Z= 0.780950 10.1065 0.000000E+00 IN CSYS= 1

```
                    0.768832      0.137040      0.000000E+00  IN CSYS=  0

KEYPOINT     63   X,Y,Z=  0.780950       30.1000       0.000000E+00  IN CSYS=  1

                    0.675640      0.391654      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.780950       30.9148       0.000000E+00  IN CSYS=  1

                    0.670002      0.401224      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.780950       31.3953       0.000000E+00  IN CSYS=  1

                    0.666614      0.406827      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.780950       45.0000       0.000000E+00  IN CSYS=  1

                    0.552215      0.552215      0.000000E+00  IN CSYS=  0

 COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
   XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
   ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
   ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

 ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

 SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
   SET IS ALL SELECTED KEYPOINTS

 MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
 KEYPOINT      1 USED FOR KEYPOINT(S)      67
 KEYPOINT     13 USED FOR KEYPOINT(S)      79
 KEYPOINT     18 USED FOR KEYPOINT(S)      84
 KEYPOINT     25 USED FOR KEYPOINT(S)      91
 KEYPOINT     31 USED FOR KEYPOINT(S)      97
 KEYPOINT     35 USED FOR KEYPOINT(S)     101
 KEYPOINT     39 USED FOR KEYPOINT(S)     105
 KEYPOINT     42 USED FOR KEYPOINT(S)     108
 KEYPOINT     45 USED FOR KEYPOINT(S)     111
 KEYPOINT     52 USED FOR KEYPOINT(S)     118
 KEYPOINT     59 USED FOR KEYPOINT(S)     125
 KEYPOINT     66 USED FOR KEYPOINT(S)     132

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
   SET IS ALL SELECTED KEYPOINTS

 MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
 KEYPOINT      1 USED FOR KEYPOINT(S)      67
 KEYPOINT      2 USED FOR KEYPOINT(S)      79
 KEYPOINT      3 USED FOR KEYPOINT(S)      84
 KEYPOINT      4 USED FOR KEYPOINT(S)      91
 KEYPOINT      5 USED FOR KEYPOINT(S)      97
 KEYPOINT      6 USED FOR KEYPOINT(S)     101
 KEYPOINT      7 USED FOR KEYPOINT(S)     105
 KEYPOINT      8 USED FOR KEYPOINT(S)     108
 KEYPOINT      9 USED FOR KEYPOINT(S)     111
 KEYPOINT     10 USED FOR KEYPOINT(S)     118
 KEYPOINT     11 USED FOR KEYPOINT(S)     125
 KEYPOINT     12 USED FOR KEYPOINT(S)     132
 KEYPOINT     44 USED FOR KEYPOINT(S)     164
 KEYPOINT     46 USED FOR KEYPOINT(S)     166
 KEYPOINT     53 USED FOR KEYPOINT(S)     173
 KEYPOINT     60 USED FOR KEYPOINT(S)     180

 DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

 KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   2.28750      IN CSYS=  0

 LINE CONNECTS KEYPOINTS       1  1001
```

```
 LINE NO.=     1 KP1=       1  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    1001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    15,  SPACING RATIO =    0.200

KEYPOINT    2001   X,Y,Z=  0.000000E+00  0.000000E+00   2.29750      IN CSYS=  0

LINE CONNECTS KEYPOINTS    1001  2001
 LINE NO.=     2  KP1=    1001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    2001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000

KEYPOINT    3001   X,Y,Z=  0.000000E+00  0.000000E+00   2.30750      IN CSYS=  0

LINE CONNECTS KEYPOINTS    2001  3001
 LINE NO.=     3  KP1=    2001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    3001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000

KEYPOINT    4001   X,Y,Z=  0.000000E+00  0.000000E+00   2.33750      IN CSYS=  0

LINE CONNECTS KEYPOINTS    3001  4001
 LINE NO.=     4  KP1=    3001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    4001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000

KEYPOINT    5001   X,Y,Z=  0.000000E+00  0.000000E+00   2.39750      IN CSYS=  0

LINE CONNECTS KEYPOINTS    4001  5001
 LINE NO.=     5  KP1=    4001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    5001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

KEYPOINT    6001   X,Y,Z=  0.000000E+00  0.000000E+00   2.62250      IN CSYS=  0

LINE CONNECTS KEYPOINTS    5001  6001
 LINE NO.=     6  KP1=    5001  TAN1=    0.0000   0.0000  -1.0000
                 KP2=    6001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

KEYPOINT    7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.100000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS       1  7001
 LINE NO.=     7  KP1=       1  TAN1=    0.0000   0.0000   1.0000
                 KP2=    7001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000

KEYPOINT    8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.700000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS    7001  8001
 LINE NO.=     8  KP1=    7001  TAN1=    0.0000   0.0000   1.0000
                 KP2=    8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

KEYPOINT    9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.295000      IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     72    81
```

```
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     81  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=    26  KP1=     73  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     86  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=    27  KP1=     74  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     87  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=    28  KP1=     75  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     82  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=    29  KP1=     76  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     83  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=    30  KP1=     77  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     88  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=    31  KP1=     78  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     89  TAN2=    1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=    32  KP1=    211  TAN1=   -0.9996   0.0293   0.0000
                  KP2=    218  TAN2=    0.9996  -0.0293   0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=    33  KP1=    210  TAN1=   -0.9996   0.0276   0.0000
                  KP2=    220  TAN2=    0.9996  -0.0276   0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=    34  KP1=    215  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    217  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=    35  KP1=    214  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    216  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=    36  KP1=    209  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    219  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=    37  KP1=    208  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    159  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=    38  KP1=    213  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    155  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=    39  KP1=    151  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    152  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    145   146
 LINE NO.=    40  KP1=    145  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    146  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    139   140
 LINE NO.=    41  KP1=    139  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    140  TAN2=    1.0000   0.0000   0.0000
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 LINE CONNECTS KEYPOINTS    134   135
  LINE NO.=     42  KP1=    134  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    135  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     14    15
  LINE NO.=     43  KP1=     14  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     15  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     19    20
  LINE NO.=     44  KP1=     19  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     20  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     25    26
  LINE NO.=     45  KP1=     25  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     26  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     31    32
  LINE NO.=     46  KP1=     31  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     32  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     98    35
  LINE NO.=     47  KP1=     98  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     35  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     92    39
  LINE NO.=     48  KP1=     92  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     39  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     93   106
  LINE NO.=     49  KP1=     93  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    106  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     99   102
  LINE NO.=     50  KP1=     99  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    102  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    100   103
  LINE NO.=     51  KP1=    100  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    103  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     94   107
  LINE NO.=     52  KP1=     94  TAN1=   -0.9996   -0.0276    0.0000
                    KP2=    107  TAN2=    0.9996    0.0276    0.0000

 LINE CONNECTS KEYPOINTS     95   104
  LINE NO.=     53  KP1=     95  TAN1=   -0.9996   -0.0293    0.0000
                    KP2=    104  TAN2=    0.9996    0.0293    0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
  Line set 3 Tube Widths on End Column

 LINE CONNECTS KEYPOINTS    162   163
  LINE NO.=     54  KP1=    162  TAN1=   -0.9999    0.0171    0.0000
                    KP2=    163  TAN2=    0.9999   -0.0171    0.0000

 LINE CONNECTS KEYPOINTS    160   161
  LINE NO.=     55  KP1=    160  TAN1=   -0.9999    0.0164    0.0000
                    KP2=    161  TAN2=    0.9999   -0.0164    0.0000

 LINE CONNECTS KEYPOINTS    156   157
  LINE NO.=     56  KP1=    156  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    157  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    153   154
  LINE NO.=     57  KP1=    153  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    154  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    147   148
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 LINE NO.=    58  KP1=    147  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    148  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    142  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    137  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     17  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     22  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     28  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     34  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     37  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -0.9999  -0.0164   0.0000
                  KP2=     41  TAN2=    0.9999   0.0164   0.0000

 LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -0.9999  -0.0171   0.0000
                  KP2=     43  TAN2=    0.9999   0.0171   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =   1.000
 line set 4 Tube Heights

 LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    200  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    204  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    209  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    214  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    216  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=    220  TAN1=    0.0164  -0.9999   0.0000
                  KP2=    219  TAN2=   -0.0164   0.9999   0.0000

 LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=    221  TAN1=    0.0171  -0.9999   0.0000
                  KP2=    162  TAN2=   -0.0171   0.9999   0.0000
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LINE CONNECTS KEYPOINTS    199   198
 LINE NO.=     75  KP1=    199  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    198  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=     76  KP1=    203  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    202  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=     77  KP1=    208  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    145  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=     78  KP1=    213  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    151  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=     79  KP1=    155  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    152  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=     80  KP1=    159  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    146  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=     81  KP1=    160  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    147  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=     82  KP1=    156  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    153  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=     83  KP1=    157  TAN1=     0.0000  -1.0000   0.0000
                   KP2=    154  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=     84  KP1=    161  TAN1=     0.0276  -0.9996   0.0000
                   KP2=    148  TAN2=    -0.0276   0.9996   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=     85  KP1=    133  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     13  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=     86  KP1=    138  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     18  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=     87  KP1=    139  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     19  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=     88  KP1=    134  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     14  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=     89  KP1=    135  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     15  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
 LINE NO.=     90  KP1=    140  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     20  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    141    21
 LINE NO.=     91  KP1=    141  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     21  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    136    16
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 LINE NO.=    92  KP1=    136  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     16  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=    93  KP1=    137  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     17  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=    94  KP1=    142  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     22  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=    95  KP1=    143  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     23  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=    96  KP1=     80  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     81  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=    97  KP1=     85  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     86  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=    98  KP1=     25  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     92  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=    99  KP1=     31  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     98  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=   100  KP1=     32  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     35  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=   101  KP1=     26  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     39  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=   102  KP1=     27  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     40  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=   103  KP1=     33  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     36  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=   104  KP1=     34  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     37  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=   105  KP1=     28  TAN1=   -0.0276  -0.9996   0.0000
                  KP2=     41  TAN2=    0.0276   0.9996   0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=   106  KP1=     29  TAN1=   -0.0293  -0.9996   0.0000
                  KP2=     38  TAN2=    0.0293   0.9996   0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=   107  KP1=     82  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     83  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=   108  KP1=     87  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     88  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=   109  KP1=     93  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     94  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS     99   100
 LINE NO.=   110  KP1=      99  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     100  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=   111  KP1=     102  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     103  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=   112  KP1=     106  TAN1=   -0.0164  -0.9999   0.0000
                  KP2=     107  TAN2=    0.0164   0.9999   0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=   113  KP1=      42  TAN1=   -0.0171  -0.9999   0.0000
                  KP2=     109  TAN2=    0.0171   0.9999   0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=   114  KP1=     158  TAN1=    0.0293  -0.9996   0.0000
                  KP2=     149  TAN2=   -0.0293   0.9996   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 Line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=   115  KP1=     207  TAN1=    0.0130  -0.9999   0.0000
                  KP2=     206  TAN2=   -0.0130   0.9999   0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=   116  KP1=     212  TAN1=    0.0137  -0.9999   0.0000
                  KP2=     211  TAN2=   -0.0137   0.9999   0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=   117  KP1=     150  TAN1=    0.9999  -0.0137   0.0000
                  KP2=     149  TAN2=   -0.9999   0.0137   0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=   118  KP1=     144  TAN1=    0.9999  -0.0130   0.0000
                  KP2=     143  TAN2=   -0.9999   0.0130   0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=   119  KP1=      24  TAN1=    0.9999   0.0130   0.0000
                  KP2=      23  TAN2=   -0.9999  -0.0130   0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=   120  KP1=      30  TAN1=    0.9999   0.0137   0.0000
                  KP2=      29  TAN2=   -0.9999  -0.0137   0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=   121  KP1=      96  TAN1=    0.0137   0.9999   0.0000
                  KP2=      95  TAN2=   -0.0137  -0.9999   0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=   122  KP1=      90  TAN1=    0.0130   0.9999   0.0000
                  KP2=      89  TAN2=   -0.0130  -0.9999   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 Line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
 LINE NO.=   123  KP1=     197  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     196  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    206   205
 LINE NO.=   124  KP1=     206  TAN1=   -0.1483  -0.9889   0.0000
                  KP2=     205  TAN2=    0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS    211   210
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LINE NO.=	125	KP1=	211	TAN1=	0.1483	-0.9889	0.0000
		KP2=	210	TAN2=	-0.1483	0.9889	0.0000
LINE CONNECTS KEYPOINTS			207	212			
LINE NO.=	126	KP1=	207	TAN1=	-0.9851	-0.1719	0.0000
		KP2=	212	TAN2=	0.9851	0.1719	0.0000
LINE CONNECTS KEYPOINTS			206	211			
LINE NO.=	127	KP1=	206	TAN1=	-1.0000	0.0000	0.0000
		KP2=	211	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			205	210			
LINE NO.=	128	KP1=	205	TAN1=	-1.0000	0.0000	0.0000
		KP2=	210	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			218	220			
LINE NO.=	129	KP1=	218	TAN1=	-0.8616	-0.5076	0.0000
		KP2=	220	TAN2=	0.8616	0.5076	0.0000
LINE CONNECTS KEYPOINTS			220	221			
LINE NO.=	130	KP1=	220	TAN1=	-0.8558	-0.5174	0.0000
		KP2=	221	TAN2=	0.8558	0.5174	0.0000
LINE CONNECTS KEYPOINTS			193	192			
LINE NO.=	131	KP1=	193	TAN1=	0.0000	-1.0000	0.0000
		KP2=	192	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			204	203			
LINE NO.=	132	KP1=	204	TAN1=	0.0000	-1.0000	0.0000
		KP2=	203	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			209	208			
LINE NO.=	133	KP1=	209	TAN1=	0.0000	-1.0000	0.0000
		KP2=	208	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			204	209			
LINE NO.=	134	KP1=	204	TAN1=	-1.0000	0.0000	0.0000
		KP2=	209	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			203	208			
LINE NO.=	135	KP1=	203	TAN1=	-1.0000	0.0000	0.0000
		KP2=	208	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			219	159			
LINE NO.=	136	KP1=	219	TAN1=	0.0000	-1.0000	0.0000
		KP2=	159	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			162	160			
LINE NO.=	137	KP1=	162	TAN1=	0.2873	-0.9578	0.0000
		KP2=	160	TAN2=	-0.2873	0.9578	0.0000
LINE CONNECTS KEYPOINTS			163	161			
LINE NO.=	138	KP1=	163	TAN1=	-0.5174	-0.8558	0.0000
		KP2=	161	TAN2=	0.5174	0.8558	0.0000
LINE CONNECTS KEYPOINTS			161	158			
LINE NO.=	139	KP1=	161	TAN1=	-0.5076	-0.8616	0.0000
		KP2=	158	TAN2=	0.5076	0.8616	0.0000
LINE CONNECTS KEYPOINTS			219	162			
LINE NO.=	140	KP1=	219	TAN1=	-0.9578	0.2873	0.0000
		KP2=	162	TAN2=	0.9578	-0.2873	0.0000
LINE CONNECTS KEYPOINTS			159	160			
LINE NO.=	141	KP1=	159	TAN1=	-1.0000	0.0000	0.0000
		KP2=	160	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			189	188			
LINE NO.=	142	KP1=	189	TAN1=	0.0000	-1.0000	0.0000
		KP2=	188	TAN2=	0.0000	1.0000	0.0000

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LINE CONNECTS KEYPOINTS    202   138
 LINE NO.=   143  KP1=     202  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     138  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=     145  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     139  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=     202  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     145  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=     138  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     139  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=     146  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     140  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=     147  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     141  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=     146  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     147  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=     140  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     141  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=     148  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     142  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=     149  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     143  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=     148  TAN1=   -0.9889    0.1483    0.0000
                  KP2=     149  TAN2=    0.9889   -0.1483    0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=     142  TAN1=   -0.9889   -0.1483    0.0000
                  KP2=     143  TAN2=    0.9889    0.1483    0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=     150  TAN1=   -0.1719   -0.9851    0.0000
                  KP2=     144  TAN2=    0.1719    0.9851    0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=      69  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      70  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=      18  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      85  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     19    25
 LINE NO.=   158  KP1=      19  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      25  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=      18  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      19  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     85    25
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LINE NO.=	160	KP1=	85	TAN1=	-1.0000	0.0000	0.0000
		KP2=	25	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			20	26			
LINE NO.=	161	KP1=	20	TAN1=	0.0000	-1.0000	0.0000
		KP2=	26	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			21	27			
LINE NO.=	162	KP1=	21	TAN1=	0.0000	-1.0000	0.0000
		KP2=	27	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			20	21			
LINE NO.=	163	KP1=	20	TAN1=	-'.0000	0.0000	0.0000
		KP2=	21	TAN2=	'.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			26	27			
LINE NO.=	164	KP1=	26	TAN1=	-'.0000	0.0000	0.0000
		KP2=	27	TAN2=	'.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			22	28			
LINE NO.=	165	KP1=	22	TAN1=	0.0000	-1.0000	0.0000
		KP2=	28	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			22	23			
LINE NO.=	166	KP1=	22	TAN1=	-0.9889	0.1483	0.0000
		KP2=	23	TAN2=	0.9889	-0.1483	0.0000
LINE CONNECTS KEYPOINTS			28	29			
LINE NO.=	167	KP1=	28	TAN1=	-0.9889	-0.1483	0.0000
		KP2=	29	TAN2=	0.9889	0.1483	0.0000
LINE CONNECTS KEYPOINTS			23	29			
LINE NO.=	168	KP1=	23	TAN1=	0.0000	-1.0000	0.0000
		KP2=	29	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			24	30			
LINE NO.=	169	KP1=	24	TAN1=	0.1719	-0.9851	0.0000
		KP2=	30	TAN2=	-0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS			73	74			
LINE NO.=	170	KP1=	73	TAN1=	0.0000	-1.0000	0.0000
		KP2=	74	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			86	87			
LINE NO.=	171	KP1=	86	TAN1=	0.0000	-1.0000	0.0000
		KP2=	87	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			92	93			
LINE NO.=	172	KP1=	92	TAN1=	0.0000	-1.0000	0.0000
		KP2=	93	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			86	92			
LINE NO.=	173	KP1=	86	TAN1=	-1.0000	0.0000	0.0000
		KP2=	92	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			87	93			
LINE NO.=	174	KP1=	87	TAN1=	-1.0000	0.0000	0.0000
		KP2=	93	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			39	106			
LINE NO.=	175	KP1=	39	TAN1=	0.0000	-1.0000	0.0000
		KP2=	106	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			40	42			
LINE NO.=	176	KP1=	40	TAN1=	-0.2873	-0.9578	0.0000
		KP2=	42	TAN2=	0.2873	0.9578	0.0000
LINE CONNECTS KEYPOINTS			39	40			
LINE NO.=	177	KP1=	39	TAN1=	-1.0000	0.0000	0.0000
		KP2=	40	TAN2=	1.0000	0.0000	0.0000

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LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=   178  KP1=     106  TAN1=   -0.9578  -0.2873   0.0000
                  KP2=      42  TAN2=    0.9578   0.2873   0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=   179  KP1=      38  TAN1=    0.5076  -0.8616   0.0000
                  KP2=      41  TAN2=   -0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=   180  KP1=      41  TAN1=    0.5174  -0.8558   0.0000
                  KP2=      43  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=   181  KP1=      77  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      78  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=   182  KP1=      88  TAN1=    0.1483  -0.9889   0.0000
                  KP2=      89  TAN2=   -0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=   183  KP1=      94  TAN1=   -0.1483  -0.9889   0.0000
                  KP2=      95  TAN2=    0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=   184  KP1=      88  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      94  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=   185  KP1=      89  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      95  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=   186  KP1=      90  TAN1=   -0.9851   0.1719   0.0000
                  KP2=      96  TAN2=    0.9851  -0.1719   0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=   187  KP1=     109  TAN1=    0.8558  -0.5174   0.0000
                  KP2=     107  TAN2=   -0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=   188  KP1=     107  TAN1=    0.8616  -0.5076   0.0000
                  KP2=     104  TAN2=   -0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=   189  KP1=     224  TAN1=   -0.9851  -0.1719   0.0000
                  KP2=     225  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=   190  KP1=     230  TAN1=   -0.9851  -0.1719   0.0000
                  KP2=     231  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=   191  KP1=     236  TAN1=   -0.9851  -0.1719   0.0000
                  KP2=     237  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=   192  KP1=     226  TAN1=   -0.8616  -0.5076   0.0000
                  KP2=     227  TAN2=    0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    227   228
 LINE NO.=   193  KP1=     227  TAN1=   -0.8558  -0.5174   0.0000
                  KP2=     228  TAN2=    0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    232   233
 LINE NO.=   194  KP1=     232  TAN1=   -0.8616  -0.5076   0.0000
                  KP2=     233  TAN2=    0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    233   234
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 LINE NO.=   195  KP1=    233  TAN1=   -0.8558  -0.5174   0.0000
                  KP2=    234  TAN2=    0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    238   239
 LINE NO.=   196  KP1=    238  TAN1=   -0.8616  -0.5076   0.0000
                  KP2=    239  TAN2=    0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    239   240
 LINE NO.=   197  KP1=    239  TAN1=   -0.8558  -0.5174   0.0000
                  KP2=    240  TAN2=    0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    171   170
 LINE NO.=   198  KP1=    171  TAN1=   -0.5174  -0.8558   0.0000
                  KP2=    170  TAN2=    0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS    170   169
 LINE NO.=   199  KP1=    170  TAN1=   -0.5076  -0.8616   0.0000
                  KP2=    169  TAN2=    0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS    178   177
 LINE NO.=   200  KP1=    178  TAN1=   -0.5174  -0.8558   0.0000
                  KP2=    177  TAN2=    0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS    177   176
 LINE NO.=   201  KP1=    177  TAN1=   -0.5076  -0.8616   0.0000
                  KP2=    176  TAN2=    0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS    185   184
 LINE NO.=   202  KP1=    185  TAN1=   -0.5174  -0.8558   0.0000
                  KP2=    184  TAN2=    0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS    184   183
 LINE NO.=   203  KP1=    184  TAN1=   -0.5076  -0.8616   0.0000
                  KP2=    183  TAN2=    0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS    168   167
 LINE NO.=   204  KP1=    168  TAN1=   -0.1719  -0.9851   0.0000
                  KP2=    167  TAN2=    0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS    175   174
 LINE NO.=   205  KP1=    175  TAN1=   -0.1719  -0.9851   0.0000
                  KP2=    174  TAN2=    0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS    182   181
 LINE NO.=   206  KP1=    182  TAN1=   -0.1719  -0.9851   0.0000
                  KP2=    181  TAN2=    0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS     47    48
 LINE NO.=   207  KP1=     47  TAN1=    0.1719  -0.9851   0.0000
                  KP2=     48  TAN2=   -0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS     54    55
 LINE NO.=   208  KP1=     54  TAN1=    0.1719  -0.9851   0.0000
                  KP2=     55  TAN2=   -0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS     61    62
 LINE NO.=   209  KP1=     61  TAN1=    0.1719  -0.9851   0.0000
                  KP2=     62  TAN2=   -0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS     49    50
 LINE NO.=   210  KP1=     49  TAN1=    0.5076  -0.8616   0.0000
                  KP2=     50  TAN2=   -0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS     50    51
 LINE NO.=   211  KP1=     50  TAN1=    0.5174  -0.8558   0.0000
                  KP2=     51  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS     56    57
 LINE NO.=   212  KP1=     56  TAN1=    0.5076  -0.8616   0.0000
                  KP2=     57  TAN2=   -0.5076   0.8616   0.0000
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 LINE CONNECTS KEYPOINTS     57    58
  LINE NO.=   213  KP1=      57  TAN1=    0.5174  -0.8558   0.0000
                   KP2=      58  TAN2=   -0.5174   0.8558   0.0000

 LINE CONNECTS KEYPOINTS     63    64
  LINE NO.=   214  KP1=      63  TAN1=    0.5076  -0.8616   0.0000
                   KP2=      64  TAN2=   -0.5076   0.8616   0.0000

 LINE CONNECTS KEYPOINTS     64    65
  LINE NO.=   215  KP1=      64  TAN1=    0.5174  -0.8558   0.0000
                   KP2=      65  TAN2=   -0.5174   0.8558   0.0000

 LINE CONNECTS KEYPOINTS    117   116
  LINE NO.=   216  KP1=     117  TAN1=    0.8558  -0.5174   0.0000
                   KP2=     116  TAN2=   -0.8558   0.5174   0.0000

 LINE CONNECTS KEYPOINTS    116   115
  LINE NO.=   217  KP1=     116  TAN1=    0.8616  -0.5076   0.0000
                   KP2=     115  TAN2=   -0.8616   0.5076   0.0000

 LINE CONNECTS KEYPOINTS    124   123
  LINE NO.=   218  KP1=     124  TAN1=    0.8558  -0.5174   0.0000
                   KP2=     123  TAN2=   -0.8558   0.5174   0.0000

 LINE CONNECTS KEYPOINTS    123   122
  LINE NO.=   219  KP1=     123  TAN1=    0.8616  -0.5076   0.0000
                   KP2=     122  TAN2=   -0.8616   0.5076   0.0000

 LINE CONNECTS KEYPOINTS    131   130
  LINE NO.=   220  KP1=     131  TAN1=    0.8558  -0.5174   0.0000
                   KP2=     130  TAN2=   -0.8558   0.5174   0.0000

 LINE CONNECTS KEYPOINTS    130   129
  LINE NO.=   221  KP1=     130  TAN1=    0.8616  -0.5076   0.0000
                   KP2=     129  TAN2=   -0.8616   0.5076   0.0000

 LINE CONNECTS KEYPOINTS    114   113
  LINE NO.=   222  KP1=     114  TAN1=    0.9851  -0.1719   0.0000
                   KP2=     113  TAN2=   -0.9851   0.1719   0.0000

 LINE CONNECTS KEYPOINTS    121   120
  LINE NO.=   223  KP1=     121  TAN1=    0.9851  -0.1719   0.0000
                   KP2=     120  TAN2=   -0.9851   0.1719   0.0000

 LINE CONNECTS KEYPOINTS    128   127
  LINE NO.=   224  KP1=     128  TAN1=    0.9851  -0.1719   0.0000
                   KP2=     127  TAN2=   -0.9851   0.1719   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000
  Line set 7 tube thickness

 LINE CONNECTS KEYPOINTS    196   195
  LINE NO.=   225  KP1=     196  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     195  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    205   201
  LINE NO.=   226  KP1=     205  TAN1=    0.7071  -0.7071   0.0000
                   KP2=     201  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS    204   200
  LINE NO.=   227  KP1=     204  TAN1=    0.7071   0.7071   0.0000
                   KP2=     200  TAN2=   -0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS    193   194
  LINE NO.=   228  KP1=     193  TAN1=    0.0000   1.0000   0.0000
                   KP2=     194  TAN2=    0.0000  -1.0000   0.0000

 LINE CONNECTS KEYPOINTS    210   215
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LINE NO.=	229	KP1=	210	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	215	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			220	217			
LINE NO.=	230	KP1=	220	TAN1=	0.6103	-0.7922	0.0000
		KP2=	217	TAN2=	-0.6103	0.7922	0.0000
LINE CONNECTS KEYPOINTS			219	216			
LINE NO.=	231	KP1=	219	TAN1=	0.7071	0.7071	0.0000
		KP2=	216	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			209	214			
LINE NO.=	232	KP1=	209	TAN1=	-0.7071	0.7071	0.0000
		KP2=	214	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			192	191			
LINE NO.=	233	KP1=	192	TAN1=	0.0000	-1.0000	0.0000
		KP2=	191	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			203	199			
LINE NO.=	234	KP1=	203	TAN1=	0.7071	-0.7071	0.0000
		KP2=	199	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			202	198			
LINE NO.=	235	KP1=	202	TAN1=	0.7071	0.7071	0.0000
		KP2=	198	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			189	190			
LINE NO.=	236	KP1=	189	TAN1=	0.0000	1.0000	0.0000
		KP2=	190	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			208	213			
LINE NO.=	237	KP1=	208	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	213	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			159	155			
LINE NO.=	238	KP1=	159	TAN1=	0.7071	-0.7071	0.0000
		KP2=	155	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			146	152			
LINE NO.=	239	KP1=	146	TAN1=	0.7071	0.7071	0.0000
		KP2=	152	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			145	151			
LINE NO.=	240	KP1=	145	TAN1=	-0.7071	0.7071	0.0000
		KP2=	151	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			160	156			
LINE NO.=	241	KP1=	160	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	156	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			161	157			
LINE NO.=	242	KP1=	161	TAN1=	0.7922	-0.6103	0.0000
		KP2=	157	TAN2=	-0.7922	0.6103	0.0000
LINE CONNECTS KEYPOINTS			148	154			
LINE NO.=	243	KP1=	148	TAN1=	0.7071	0.7071	0.0000
		KP2=	154	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			147	153			
LINE NO.=	244	KP1=	147	TAN1=	-0.7071	0.7071	0.0000
		KP2=	153	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			188	187			
LINE NO.=	245	KP1=	188	TAN1=	0.0000	-1.0000	0.0000
		KP2=	187	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			138	133			
LINE NO.=	246	KP1=	138	TAN1=	0.7071	-0.7071	0.0000
		KP2=	133	TAN2=	-0.7071	0.7071	0.0000

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LINE CONNECTS KEYPOINTS     18    13
 LINE NO.=   247  KP1=      18  TAN1=    0.7071   0.7071   0.0000
                  KP2=      13  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     69    68
 LINE NO.=   248  KP1=      69  TAN1=    0.0000   1.0000   0.0000
                  KP2=      68  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    139   134
 LINE NO.=   249  KP1=     139  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     134  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    140   135
 LINE NO.=   250  KP1=     140  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     135  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     20    15
 LINE NO.=   251  KP1=      20  TAN1=    0.7071   0.7071   0.0000
                  KP2=      15  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     19    14
 LINE NO.=   252  KP1=      19  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      14  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    141   136
 LINE NO.=   253  KP1=     141  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     136  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    142   137
 LINE NO.=   254  KP1=     142  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     137  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     22    17
 LINE NO.=   255  KP1=      22  TAN1=    0.7071   0.7071   0.0000
                  KP2=      17  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     21    16
 LINE NO.=   256  KP1=      21  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      16  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     70    71
 LINE NO.=   257  KP1=      70  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      71  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    80
 LINE NO.=   258  KP1=      85  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      80  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     86    81
 LINE NO.=   259  KP1=      86  TAN1=    0.7071   0.7071   0.0000
                  KP2=      81  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     73    72
 LINE NO.=   260  KP1=      73  TAN1=    0.0000   1.0000   0.0000
                  KP2=      72  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    31
 LINE NO.=   261  KP1=      25  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      31  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     26    32
 LINE NO.=   262  KP1=      26  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      32  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     39    35
 LINE NO.=   263  KP1=      39  TAN1=    0.7071   0.7071   0.0000
                  KP2=      35  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     92    98
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 LINE NO.=   264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     98  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=     27  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     33  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=     28  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     34  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=     41  TAN1=    0.7922   0.6103   0.0000
                  KP2=     37  TAN2=   -0.7922  -0.6103   0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=     40  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     36  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=     74  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     75  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=     87  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     82  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=     88  TAN1=    0.7071   0.7071   0.0000
                  KP2=     83  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=     77  TAN1=    0.0000   1.0000   0.0000
                  KP2=     76  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=     93  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     99  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=    106  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    102  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=    107  TAN1=    0.6103   0.7922   0.0000
                  KP2=    103  TAN2=   -0.6103  -0.7922   0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=     94  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    100  TAN2=    0.7071  -0.7071   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO       1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=    222  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    207  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS    223   224
 LINE NO.=   278  KP1=    223  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    224  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279  KP1=    229  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    230  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS    235   236
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 LINE NO.=   280  KP1=    235  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    236  TAN2=    0.9857   0.1684   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 9, arc 2 side arcs

 LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281  KP1=    212  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    218  TAN2=    0.8652   0.5015   0.0000

 LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282  KP1=    225  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    226  TAN2=    0.8652   0.5015   0.0000

 LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283  KP1=    231  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    232  TAN2=    0.8652   0.5015   0.0000

 LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284  KP1=    237  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    238  TAN2=    0.8652   0.5015   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 10, arc 3 side arcs

 LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285  KP1=    221  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    163  TAN2=    0.5209   0.8536   0.0000

 LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286  KP1=    228  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    171  TAN2=    0.5209   0.8536   0.0000

 LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287  KP1=    234  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    178  TAN2=    0.5209   0.8536   0.0000

 LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288  KP1=    240  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    185  TAN2=    0.5209   0.8536   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 11, arc 4 side arcs

 LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289  KP1=    158  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    150  TAN2=    0.1755   0.9845   0.0000

 LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290  KP1=    169  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    168  TAN2=    0.1755   0.9845   0.0000

 LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291  KP1=    176  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    175  TAN2=    0.1755   0.9845   0.0000

 LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292  KP1=    183  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    182  TAN2=    0.1755   0.9845   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 12, arc 5 side arcs

 LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     24  TAN2=   -0.1684   0.9857   0.0000
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 LINE CONNECTS KEYPOINTS    167    47
  LINE NO.=   294  KP1=     167  TAN1=   -0.1684  -0.9857   0.0000
                   KP2=      47  TAN2=   -0.1684   0.9857   0.0000

 LINE CONNECTS KEYPOINTS    174    54
  LINE NO.=   295  KP1=     174  TAN1=   -0.1684  -0.9857   0.0000
                   KP2=      54  TAN2=   -0.1684   0.9857   0.0000

 LINE CONNECTS KEYPOINTS    181    61
  LINE NO.=   296  KP1=     181  TAN1=   -0.1684  -0.9857   0.0000
                   KP2=      61  TAN2=   -0.1684   0.9857   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 13, arc 6 side arcs

 LINE CONNECTS KEYPOINTS     30    38
  LINE NO.=   297  KP1=      30  TAN1=    0.1755  -0.9845   0.0000
                   KP2=      38  TAN2=   -0.5015   0.8652   0.0000

 LINE CONNECTS KEYPOINTS     48    49
  LINE NO.=   298  KP1=      48  TAN1=    0.1755  -0.9845   0.0000
                   KP2=      49  TAN2=   -0.5015   0.8652   0.0000

 LINE CONNECTS KEYPOINTS     55    56
  LINE NO.=   299  KP1=      55  TAN1=    0.1755  -0.9845   0.0000
                   KP2=      56  TAN2=   -0.5015   0.8652   0.0000

 LINE CONNECTS KEYPOINTS     62    63
  LINE NO.=   300  KP1=      62  TAN1=    0.1755  -0.9845   0.0000
                   KP2=      63  TAN2=   -0.5015   0.8652   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 14, arc 7 side arcs

 LINE CONNECTS KEYPOINTS     43   109
  LINE NO.=   301  KP1=      43  TAN1=    0.5209  -0.8536   0.0000
                   KP2=     109  TAN2=   -0.8536   0.5209   0.0000

 LINE CONNECTS KEYPOINTS     51   117
  LINE NO.=   302  KP1=      51  TAN1=    0.5209  -0.8536   0.0000
                   KP2=     117  TAN2=   -0.8536   0.5209   0.0000

 LINE CONNECTS KEYPOINTS     58   124
  LINE NO.=   303  KP1=      58  TAN1=    0.5209  -0.8536   0.0000
                   KP2=     124  TAN2=   -0.8536   0.5209   0.0000

 LINE CONNECTS KEYPOINTS     65   131
  LINE NO.=   304  KP1=      65  TAN1=    0.5209  -0.8536   0.0000
                   KP2=     131  TAN2=   -0.8536   0.5209   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 15, arc 8 side arcs

 LINE CONNECTS KEYPOINTS    104    96
  LINE NO.=   305  KP1=     104  TAN1=    0.8652  -0.5015   0.0000
                   KP2=      96  TAN2=   -0.9845   0.1755   0.0000

 LINE CONNECTS KEYPOINTS    115   114
  LINE NO.=   306  KP1=     115  TAN1=    0.8652  -0.5015   0.0000
                   KP2=     114  TAN2=   -0.9845   0.1755   0.0000

 LINE CONNECTS KEYPOINTS    122   121
  LINE NO.=   307  KP1=     122  TAN1=    0.8652  -0.5015   0.0000
                   KP2=     121  TAN2=   -0.9845   0.1755   0.0000

 LINE CONNECTS KEYPOINTS    129   128
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 LINE NO.=   308  KP1=    129  TAN1=    0.8652  -0.5015   0.0000
                  KP2=    128  TAN2=   -0.9845   0.1755   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=     90  TAN1=    0.9857  -0.1684   0.0000
                  KP2=    110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=    113  TAN1=    0.9857  -0.1684   0.0000
                  KP2=    112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=    120  TAN1=    0.9857  -0.1684   0.0000
                  KP2=    119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=    127  TAN1=    0.9857  -0.1684   0.0000
                  KP2=    126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=    222  TAN1=    0.0000   1.0000   0.0000
                  KP2=    223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=    207  TAN1=   -0.1684   0.9857   0.0000
                  KP2=    224  TAN2=    0.1684  -0.9857   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=    212  TAN1=   -0.1755   0.9845   0.0000
                  KP2=    225  TAN2=    0.1755  -0.9845   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=    218  TAN1=   -0.5015   0.8652   0.0000
                  KP2=    226  TAN2=    0.5015  -0.8652   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=    220  TAN1=   -0.5138   0.8579   0.0000
                  KP2=    227  TAN2=    0.5138  -0.8579   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=    221  TAN1=   -0.5209   0.8536   0.0000
                  KP2=    228  TAN2=    0.5209  -0.8536   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=    163  TAN1=   -0.8536   0.5209   0.0000
                  KP2=    171  TAN2=    0.8536  -0.5209   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=    161  TAN1=   -0.8579   0.5138   0.0000
                  KP2=    170  TAN2=    0.8579  -0.5138   0.0000

LINE CONNECTS KEYPOINTS    158   169
 LINE NO.=   321  KP1=    158  TAN1=   -0.8652   0.5015   0.0000
                  KP2=    169  TAN2=    0.8652  -0.5015   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=    150  TAN1=   -0.9845   0.1755   0.0000
                  KP2=    168  TAN2=    0.9845  -0.1755   0.0000

LINE CONNECTS KEYPOINTS    144   167
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 LINE NO.=   323  KP1=    144  TAN1=  -0.9857   0.1684   0.0000
                  KP2=    167  TAN2=   0.9857  -0.1684   0.0000

LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=     24  TAN1=  -0.9857  -0.1684   0.0000
                  KP2=     47  TAN2=   0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=     30  TAN1=  -0.9845  -0.1755   0.0000
                  KP2=     48  TAN2=   0.9845   0.1755   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=     38  TAN1=  -0.8652  -0.5015   0.0000
                  KP2=     49  TAN2=   0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=     41  TAN1=  -0.8579  -0.5138   0.0000
                  KP2=     50  TAN2=   0.8579   0.5138   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=     43  TAN1=  -0.8536  -0.5209   0.0000
                  KP2=     51  TAN2=   0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=    109  TAN1=  -0.5209  -0.8536   0.0000
                  KP2=    117  TAN2=   0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=    107  TAN1=  -0.5138  -0.8579   0.0000
                  KP2=    116  TAN2=   0.5138   0.8579   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=    104  TAN1=  -0.5015  -0.8652   0.0000
                  KP2=    115  TAN2=   0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=     96  TAN1=  -0.1755  -0.9845   0.0000
                  KP2=    114  TAN2=   0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=     90  TAN1=  -0.1684  -0.9857   0.0000
                  KP2=    113  TAN2=   0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=    110  TAN1=   0.0000  -1.0000   0.0000
                  KP2=    112  TAN2=   0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=    223  TAN1=   0.0000   1.0000   0.0000
                  KP2=    229  TAN2=   0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=    224  TAN1=  -0.1684   0.9857   0.0000
                  KP2=    230  TAN2=   0.1684  -0.9857   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=    225  TAN1=  -0.1755   0.9845   0.0000
                  KP2=    231  TAN2=   0.1755  -0.9845   0.0000

LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=   338  KP1=    226  TAN1=  -0.5015   0.8652   0.0000
                  KP2=    232  TAN2=   0.5015  -0.8652   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=   339  KP1=    227  TAN1=  -0.5138   0.8579   0.0000
                  KP2=    233  TAN2=   0.5138  -0.8579   0.0000
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 LINE CONNECTS KEYPOINTS    228   234
  LINE NO.=    340  KP1=    228  TAN1=   -0.5209   0.8536   0.0000
                    KP2=    234  TAN2=    0.5209  -0.8536   0.0000

 LINE CONNECTS KEYPOINTS    171   178
  LINE NO.=    341  KP1=    171  TAN1=   -0.8536   0.5209   0.0000
                    KP2=    178  TAN2=    0.8536  -0.5209   0.0000

 LINE CONNECTS KEYPOINTS    170   177
  LINE NO.=    342  KP1=    170  TAN1=   -0.8579   0.5138   0.0000
                    KP2=    177  TAN2=    0.8579  -0.5138   0.0000

 LINE CONNECTS KEYPOINTS    169   176
  LINE NO.=    343  KP1=    169  TAN1=   -0.8652   0.5015   0.0000
                    KP2=    176  TAN2=    0.8652  -0.5015   0.0000

 LINE CONNECTS KEYPOINTS    168   175
  LINE NO.=    344  KP1=    168  TAN1=   -0.9845   0.1755   0.0000
                    KP2=    175  TAN2=    0.9845  -0.1755   0.0000

 LINE CONNECTS KEYPOINTS    167   174
  LINE NO.=    345  KP1=    167  TAN1=   -0.9857   0.1684   0.0000
                    KP2=    174  TAN2=    0.9857  -0.1684   0.0000

 LINE CONNECTS KEYPOINTS     47    54
  LINE NO.=    346  KP1=     47  TAN1=   -0.9857  -0.1684   0.0000
                    KP2=     54  TAN2=    0.9857   0.1684   0.0000

 LINE CONNECTS KEYPOINTS     48    55
  LINE NO.=    347  KP1=     48  TAN1=   -0.9845  -0.1755   0.0000
                    KP2=     55  TAN2=    0.9845   0.1755   0.0000

 LINE CONNECTS KEYPOINTS     49    56
  LINE NO.=    348  KP1=     49  TAN1=   -0.8652  -0.5015   0.0000
                    KP2=     56  TAN2=    0.8652   0.5015   0.0000

 LINE CONNECTS KEYPOINTS     50    57
  LINE NO.=    349  KP1=     50  TAN1=   -0.8579  -0.5138   0.0000
                    KP2=     57  TAN2=    0.8579   0.5138   0.0000

 LINE CONNECTS KEYPOINTS     51    58
  LINE NO.=    350  KP1=     51  TAN1=   -0.8536  -0.5209   0.0000
                    KP2=     58  TAN2=    0.8536   0.5209   0.0000

 LINE CONNECTS KEYPOINTS    117   124
  LINE NO.=    351  KP1=    117  TAN1=   -0.5209  -0.8536   0.0000
                    KP2=    124  TAN2=    0.5209   0.8536   0.0000

 LINE CONNECTS KEYPOINTS    116   123
  LINE NO.=    352  KP1=    116  TAN1=   -0.5138  -0.8579   0.0000
                    KP2=    123  TAN2=    0.5138   0.8579   0.0000

 LINE CONNECTS KEYPOINTS    115   122
  LINE NO.=    353  KP1=    115  TAN1=   -0.5015  -0.8652   0.0000
                    KP2=    122  TAN2=    0.5015   0.8652   0.0000

 LINE CONNECTS KEYPOINTS    114   121
  LINE NO.=    354  KP1=    114  TAN1=   -0.1755  -0.9845   0.0000
                    KP2=    121  TAN2=    0.1755   0.9845   0.0000

 LINE CONNECTS KEYPOINTS    113   120
  LINE NO.=    355  KP1=    113  TAN1=   -0.1684  -0.9857   0.0000
                    KP2=    120  TAN2=    0.1684   0.9857   0.0000

 LINE CONNECTS KEYPOINTS    112   119
  LINE NO.=    356  KP1=    112  TAN1=    0.0000  -1.0000   0.0000
                    KP2=    119  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
```

TO NDIV = 2, SPACING RATIO = 1.000
line set 19 skirt thickness

LINE CONNECTS KEYPOINTS		229	235			
LINE NO.=	357	KP1=	229	TAN1=	0.0000	1.0000	0.0000
		KP2=	235	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS		230	236			
LINE NO.=	358	KP1=	230	TAN1=	-0.1684	0.9857	0.0000
		KP2=	236	TAN2=	0.1684	-0.9857	0.0000
LINE CONNECTS KEYPOINTS		231	237			
LINE NO.=	359	KP1=	231	TAN1=	-0.1755	0.9845	0.0000
		KP2=	237	TAN2=	0.1755	-0.9845	0.0000
LINE CONNECTS KEYPOINTS		232	238			
LINE NO.=	360	KP1=	232	TAN1=	-0.5015	0.8652	0.0000
		KP2=	238	TAN2=	0.5015	-0.8652	0.0000
LINE CONNECTS KEYPOINTS		233	239			
LINE NO.=	361	KP1=	233	TAN1=	-0.5138	0.8579	0.0000
		KP2=	239	TAN2=	0.5138	-0.8579	0.0000
LINE CONNECTS KEYPOINTS		234	240			
LINE NO.=	362	KP1=	234	TAN1=	-0.5209	0.8536	0.0000
		KP2=	240	TAN2=	0.5209	-0.8536	0.0000
LINE CONNECTS KEYPOINTS		178	185			
LINE NO.=	363	KP1=	178	TAN1=	-0.8536	0.5209	0.0000
		KP2=	185	TAN2=	0.8536	-0.5209	0.0000
LINE CONNECTS KEYPOINTS		177	184			
LINE NO.=	364	KP1=	177	TAN1=	-0.8579	0.5138	0.0000
		KP2=	184	TAN2=	0.8579	-0.5138	0.0000
LINE CONNECTS KEYPOINTS		176	183			
LINE NO.=	365	KP1=	176	TAN1=	-0.8652	0.5015	0.0000
		KP2=	183	TAN2=	0.8652	-0.5015	0.0000
LINE CONNECTS KEYPOINTS		175	182			
LINE NO.=	366	KP1=	175	TAN1=	-0.9845	0.1755	0.0000
		KP2=	182	TAN2=	0.9845	-0.1755	0.0000
LINE CONNECTS KEYPOINTS		174	181			
LINE NO.=	367	KP1=	174	TAN1=	-0.9857	0.1684	0.0000
		KP2=	181	TAN2=	0.9857	-0.1684	0.0000
LINE CONNECTS KEYPOINTS		54	61			
LINE NO.=	368	KP1=	54	TAN1=	-0.9857	-0.1684	0.0000
		KP2=	61	TAN2=	0.9857	0.1684	0.0000
LINE CONNECTS KEYPOINTS		55	62			
LINE NO.=	369	KP1=	55	TAN1=	-0.9845	-0.1755	0.0000
		KP2=	62	TAN2=	0.9845	0.1755	0.0000
LINE CONNECTS KEYPOINTS		56	63			
LINE NO.=	370	KP1=	56	TAN1=	-0.8652	-0.5015	0.0000
		KP2=	63	TAN2=	0.8652	0.5015	0.0000
LINE CONNECTS KEYPOINTS		57	64			
LINE NO.=	371	KP1=	57	TAN1=	-0.8579	-0.5138	0.0000
		KP2=	64	TAN2=	0.8579	0.5138	0.0000
LINE CONNECTS KEYPOINTS		58	65			
LINE NO.=	372	KP1=	58	TAN1=	-0.8536	-0.5209	0.0000
		KP2=	65	TAN2=	0.8536	0.5209	0.0000
LINE CONNECTS KEYPOINTS		124	131			
LINE NO.=	373	KP1=	124	TAN1=	-0.5209	-0.8536	0.0000
		KP2=	131	TAN2=	0.5209	0.8536	0.0000

```
LINE CONNECTS KEYPOINTS    123   130
 LINE NO.=   374  KP1=    123  TAN1=   -0.5138  -0.8579   0.0000
                  KP2=    130  TAN2=    0.5138   0.8579   0.0000

LINE CONNECTS KEYPOINTS    122   129
 LINE NO.=   375  KP1=    122  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    129  TAN2=    0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS    121   128
 LINE NO.=   376  KP1=    121  TAN1=   -0.1755  -0.9845   0.0000
                  KP2=    128  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    120   127
 LINE NO.=   377  KP1=    120  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=    127  TAN2=    0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    119   126
 LINE NO.=   378  KP1=    119  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    126  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 lines to fill in lids
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=   379  KP1=    195  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    194  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=   380  KP1=    191  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    190  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=   381  KP1=    187  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     68  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=   382  KP1=     71  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     72  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=   383  KP1=     75  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     76  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=   384  KP1=    222  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    197  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=   385  KP1=     78  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    110  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 area set 1, tubes

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     195   196   205   201

    AREA NUMBER =       1

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     200   201   205   204
```

```
     AREA NUMBER =       2

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     193   194   200   204

     AREA NUMBER =       3

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     191   192   203   199

     AREA NUMBER =       4

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     198   199   203   202

     AREA NUMBER =       5

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     189   190   198   202

     AREA NUMBER =       6

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     187   188   138   133

     AREA NUMBER =       7

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     133   138    18    13

     AREA NUMBER =       8

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      69    68    13    18

     AREA NUMBER =       9

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      71    70    85    80

     AREA NUMBER =      10

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      80    85    86    81

     AREA NUMBER =      11

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      73    72    81    86

     AREA NUMBER =      12

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      75    74    87    82

     AREA NUMBER =      13

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      82    87    88    83

     AREA NUMBER =      14

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =      77    76    83    88

     AREA NUMBER =      15

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     209   210   215   214
```

```
     AREA NUMBER =     16

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    215   210   220   217

     AREA NUMBER =     17

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    216   217   220   219

     AREA NUMBER =     18

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    209   214   216   219

     AREA NUMBER =     19

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    145   208   213   151

     AREA NUMBER =     20

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    213   208   159   155

     AREA NUMBER =     21

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    152   155   159   146

     AREA NUMBER =     22

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    145   151   152   146

     AREA NUMBER =     23

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    134   139   140   135

     AREA NUMBER =     24

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    135   140    20    15

     AREA NUMBER =     25

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     19    14    15    20

     AREA NUMBER =     26

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     19   139   134    14

     AREA NUMBER =     27

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     92    25    31    98

     AREA NUMBER =     28

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     31    25    26    32

     AREA NUMBER =     29

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     32    26    39    35
```

```
    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    98    35    39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    93    99   100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99    93   106   102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102   106   107   103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94   100   103   107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156   160   161   157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157   161   148   154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   153   154   148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   160   156   153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136   141   142   137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137   142    22    17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    16    17    22

    AREA NUMBER =     42

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34
```

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    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    202   203   208   145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146   159   160   147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188   189   202   138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138   202   145   139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139   145   146   140

    AREA NUMBER =     56

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142
```

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     AREA NUMBER =     58

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     18   138   139    19

     AREA NUMBER =     59

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     20   140   141    21

     AREA NUMBER =     60

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     70    69    18    85

     AREA NUMBER =     61

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     85    18    19    25

     AREA NUMBER =     62

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     25    19    20    26

     AREA NUMBER =     63

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     26    20    21    27

     AREA NUMBER =     64

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     27    21    22    28

     AREA NUMBER =     65

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     86    85    25    92

     AREA NUMBER =     66

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     39    26    27    40

     AREA NUMBER =     67

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     74    73    86    87

     AREA NUMBER =     68

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     87    86    92    93

     AREA NUMBER =     69

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     93    92    39   106

     AREA NUMBER =     70

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     88    87    93    94

     AREA NUMBER =     71
 area set 3, end guides

 DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    196   197   206   205

    AREA NUMBER =     72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205   206   211   210

    AREA NUMBER =     73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206   207   212   211

    AREA NUMBER =     74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210   211   218   220

    AREA NUMBER =     75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148   161   158   149

    AREA NUMBER =     76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142   148   149   143

    AREA NUMBER =     77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143   149   150   144

    AREA NUMBER =     78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22   142   143    23

    AREA NUMBER =     79

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     28    22    23    29

    AREA NUMBER =     80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     29    23    24    30

    AREA NUMBER =     81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    28    29    38

    AREA NUMBER =     82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     95    94   107   104

    AREA NUMBER =     83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     89    88    94    95

    AREA NUMBER =     84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    89    95    96

    AREA NUMBER =     85

DEFINE AREA BY LIST OF KEYPOINTS
```

```
   KEYPOINT LIST =     78    77    88    89

     AREA NUMBER =     86
 area set 4, corner guides

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    219   220   221   162

     AREA NUMBER =     87

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    159   219   162   160

     AREA NUMBER =     88

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    160   162   163   161

     AREA NUMBER =     89

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    107   106    42   109

     AREA NUMBER =     90

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    106    39    40    42

     AREA NUMBER =     91

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     42    40    41    43

     AREA NUMBER =     92

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
  area set 5, inner barrier

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    222   223   224   207

     AREA NUMBER =     93

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    207   224   225   2'2

     AREA NUMBER =     94

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    212   225   226   218

     AREA NUMBER =     95

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    218   226   227   220

     AREA NUMBER =     96

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    220   227   228   221

     AREA NUMBER =     97

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    221   228   171   163

     AREA NUMBER =     98

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    163   171   170   161
```

```
    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   153

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104   115   114    96

    AREA NUMBER =    111

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90   113   112   110
```

```
   AREA NUMBER =    113
 area set 6, outer barrier

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 DRAG ALL SELECTED AREAS
      ALONG LINES
          1,

 *** WARNING ***                          CP=      5.000   TIME= 12:57:23
 Area 1 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.000   TIME= 12:57:23
 Area 2 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.000   TIME= 12:57:23
 Area 3 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.000   TIME= 12:57:23
 Area 4 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 5 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 6 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 7 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 8 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 9 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 10 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 11 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 12 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 13 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 14 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.010   TIME= 12:57:23
 Area 15 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.020   TIME= 12:57:23
 Area 16 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.020   TIME= 12:57:23
 Area 17 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.020   TIME= 12:57:23
 Area 18 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.020   TIME= 12:57:23
 Area 19 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.020   TIME= 12:57:23
 Area 20 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.020   TIME= 12:57:23
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.030   TIME= 12:57:23
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 41 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
```

```
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.040   TIME= 12:57:23
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 12:57:23
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 12:57:23
Area 67 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.060   TIME= 12:57:23
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.060   TIME= 12:57:23
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.060   TIME= 12:57:23
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 12:57:23
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 90 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.080   TIME= 12:57:23
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 12:57:23
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.100   TIME= 12:57:23
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.110   TIME= 12:57:23
Area 113 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2875     AND   2.2875
```

```
   KABS=  0.  TOLERANCE= 0.114375E-01

   113  AREAS (OF   509  DEFINED) SELECTED BY  ASEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 UNSELECT      FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.00000E+00 AND  0.68095
   KABS=  0.  TOLERANCE= 0.000000E+00

    21  AREAS (OF    509  DEFINED) SELECTED BY ASEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 DRAG ALL SELECTED AREAS
      ALONG LINES
          2,

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 441 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 444 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 448 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 451 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 454 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.500   TIME= 12:57:30
 Area 458 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 461 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 464 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 468 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 471 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 475 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 478 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 482 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 485 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 488 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 492 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.510   TIME= 12:57:30
 Area 495 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                                CP=      11.520   TIME= 12:57:30
 Area 498 is not meshed.  Volume will be generated without elements.
```

```
 *** WARNING ***                         CP=      11.520   TIME= 12:57:30
 Area 502 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                         CP=      11.520   TIME= 12:57:30
 Area 505 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                         CP=      11.520   TIME= 12:57:30
 Area 509 is not meshed.  Volume will be generated without elements.
  copy areas from top of basket to bottom of lid

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2775     AND   2.2775
   KABS=  0.  TOLERANCE= 0.113875E-01

    113  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
   KABS=  0.  TOLERANCE= 0.000000E+00

     92  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 GENERATE    2 TOTAL SETS OF AREAS
   SET IS ALL SELECTED AREAS
   DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

 MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
 KEYPOINT    373 USED FOR KEYPOINT(S)     521
 KEYPOINT    375 USED FOR KEYPOINT(S)     522
 KEYPOINT    377 USED FOR KEYPOINT(S)     523
 KEYPOINT    379 USED FOR KEYPOINT(S)     458
 KEYPOINT    381 USED FOR KEYPOINT(S)     540
 KEYPOINT    383 USED FOR KEYPOINT(S)     542
 KEYPOINT    385 USED FOR KEYPOINT(S)     496
 KEYPOINT    387 USED FOR KEYPOINT(S)     524
 KEYPOINT    389 USED FOR KEYPOINT(S)     527
 KEYPOINT    391 USED FOR KEYPOINT(S)     528
 KEYPOINT    393 USED FOR KEYPOINT(S)     531
 KEYPOINT    395 USED FOR KEYPOINT(S)     532
 KEYPOINT    397 USED FOR KEYPOINT(S)     533
 KEYPOINT    399 USED FOR KEYPOINT(S)     514
 KEYPOINT    401 USED FOR KEYPOINT(S)     545
 KEYPOINT    403 USED FOR KEYPOINT(S)     544
 KEYPOINT    405 USED FOR KEYPOINT(S)     492
 KEYPOINT    407 USED FOR KEYPOINT(S)     535
 KEYPOINT    409 USED FOR KEYPOINT(S)     538
 KEYPOINT    410 USED FOR KEYPOINT(S)     537
 LINE     837 USED FOR LINE(S)    1121
 LINE     847 USED FOR LINE(S)    1124
 LINE     852 USED FOR LINE(S)    1152
 LINE     862 USED FOR LINE(S)    1157
 LINE     867 USED FOR LINE(S)    1125
 LINE     877 USED FOR LINE(S)    1131
 LINE     887 USED FOR LINE(S)    1138
 LINE     897 USED FOR LINE(S)    1141
 LINE     902 USED FOR LINE(S)    1162
 LINE     912 USED FOR LINE(S)    1160
 LINE     917 USED FOR LINE(S)    1143
 LINE     923 USED FOR LINE(S)    1149
  generate lines to fill in lid at top of WP
  lines tube height

 LINE CONNECTS KEYPOINTS    414   421
  LINE NO.=  1121  KP1=     414  TAN1=     0.0000  -1.0000   0.0000
                   KP2=     421  TAN2=     0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    422   429
```

```
 LINE NO.=  1124  KP1=    422  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    429  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    430   437
 LINE NO.=  1125  KP1=    430  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    437  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    438   445
 LINE NO.=  1131  KP1=    438  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    445  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    446   453
 LINE NO.=  1138  KP1=    446  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    453  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    370   518
 LINE NO.=  1141  KP1=    370  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    518  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    539   413
 LINE NO.=  1143  KP1=    539  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    413  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =   832 1116 1120 1141
     (TRAVERSED IN SAME DIRECTION AS LINE   832)

    AREA NUMBER =    687

DEFINE AREA BY LIST OF LINES
     LINE LIST =   936  937  941 1121
     (TRAVERSED IN SAME DIRECTION AS LINE   936)

    AREA NUMBER =    688

DEFINE AREA BY LIST OF LINES
     LINE LIST =   946  947  951 1124
     (TRAVERSED IN SAME DIRECTION AS LINE   946)

    AREA NUMBER =    689

DEFINE AREA BY LIST OF LINES
     LINE LIST =   956  959  961 1125
     (TRAVERSED IN SAME DIRECTION AS LINE   956)

    AREA NUMBER =    690

DEFINE AREA BY LIST OF LINES
     LINE LIST =   966  969  971 1131
     (TRAVERSED IN SAME DIRECTION AS LINE   966)

    AREA NUMBER =    691

DEFINE AREA BY LIST OF LINES
     LINE LIST =   976  979  981 1138
     (TRAVERSED IN SAME DIRECTION AS LINE   976)

    AREA NUMBER =    692

DEFINE AREA BY LIST OF LINES
     LINE LIST =   932 1143 1147 1151
     (TRAVERSED IN SAME DIRECTION AS LINE   932)
```

```
    AREA NUMBER =   693

DEFINE AREA BY LIST OF LINES
     LINE LIST =   842 1122 1123
     (TRAVERSED IN SAME DIRECTION AS LINE   842)

    AREA NUMBER =   694

DEFINE AREA BY LIST OF LINES
     LINE LIST =   985  989  990  993
     (TRAVERSED IN SAME DIRECTION AS LINE   985)

    AREA NUMBER =   695

DEFINE AREA BY LIST OF LINES
     LINE LIST =   997 1001 1002 1005
     (TRAVERSED IN SAME DIRECTION AS LINE   997)

    AREA NUMBER =   696

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1010 1013 1015 1018
     (TRAVERSED IN SAME DIRECTION AS LINE  1010)

    AREA NUMBER =   697

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1021 1025 1028 1029
     (TRAVERSED IN SAME DIRECTION AS LINE  1021)

    AREA NUMBER =   698

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1033 1037 1040 1041
     (TRAVERSED IN SAME DIRECTION AS LINE  1033)

    AREA NUMBER =   699

DEFINE AREA BY LIST OF LINES
     LINE LIST =   922 1144 1148
     (TRAVERSED IN SAME DIRECTION AS LINE   922)

    AREA NUMBER =   700

DEFINE AREA BY LIST OF LINES
     LINE LIST =   857 1153 1156
     (TRAVERSED IN SAME DIRECTION AS LINE   857)

    AREA NUMBER =   701

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1046 1049 1051 1054
     (TRAVERSED IN SAME DIRECTION AS LINE  1046)

    AREA NUMBER =   702

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1058 1061 1063 1066
     (TRAVERSED IN SAME DIRECTION AS LINE  1058)

    AREA NUMBER =   703

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1070 1073 1075 1078
     (TRAVERSED IN SAME DIRECTION AS LINE  1070)

    AREA NUMBER =   704

DEFINE AREA BY LIST OF LINES
     LINE LIST =   907 1159 1163
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE   907)

    AREA NUMBER =    705

DEFINE AREA BY LIST OF LINES
     LINE LIST =   872 1126 1130
     (TRAVERSED IN SAME DIRECTION AS LINE   872)

    AREA NUMBER =    706

DEFINE AREA BY LIST OF LINES
     LINE LIST =   882 1132 1133 1137
     (TRAVERSED IN SAME DIRECTION AS LINE   882)

    AREA NUMBER =    707

DEFINE AREA BY LIST OF LINES
     LINE LIST =   892 1139 1140
     (TRAVERSED IN SAME DIRECTION AS LINE   892)

    AREA NUMBER =    708

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.3075     AND   2.3075
  KABS=  0.  TOLERANCE= 0.115375E-01

  135  AREAS (OF   708  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         3,

*** WARNING ***                          CP=     15.510   TIME= 12:57:34
Area 514 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.510   TIME= 12:57:34
Area 518 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.510   TIME= 12:57:34
Area 522 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 526 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 530 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 542 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 546 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 550 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 554 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 562 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     15.520   TIME= 12:57:34
Area 566 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 578 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 586 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 590 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 595 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.530   TIME= 12:57:34
Area 598 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 599 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 601 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 602 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 605 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 607 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 608 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.540   TIME= 12:57:34
Area 609 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.550   TIME= 12:57:34
```

```
Area 610 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 611 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 613 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 614 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 615 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 616 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 617 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 618 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 619 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.550   TIME= 12:57:34
Area 620 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 621 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 622 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 623 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 624 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 625 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 626 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 627 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 629 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 630 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 12:57:34
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 12:57:34
Area 632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 12:57:34
Area 633 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 635 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 638 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 639 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 641 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 12:57:34
Area 642 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 645 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 647 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 650 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 12:57:34
Area 653 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 656 is not meshed.  Volume will be generated without elements.
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*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 659 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 662 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 12:57:34
Area 663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 665 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 668 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 671 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.600   TIME= 12:57:34
Area 674 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
Area 675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
Area 677 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
Area 678 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
Area 679 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.610   TIME= 12:57:34
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Area 680 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.610 TIME= 12:57:34
Area 681 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.610 TIME= 12:57:34
Area 682 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.610 TIME= 12:57:34
Area 683 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.610 TIME= 12:57:34
Area 684 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 685 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 686 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 687 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 688 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 689 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 690 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 691 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 692 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 693 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 694 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.620 TIME= 12:57:34
Area 695 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 696 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 697 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 698 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 699 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 700 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 701 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 702 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.630 TIME= 12:57:34
Area 703 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=      15.630   TIME= 12:57:34
Area 704 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.630   TIME= 12:57:34
Area 705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.640   TIME= 12:57:34
Area 706 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.640   TIME= 12:57:34
Area 707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.640   TIME= 12:57:34
Area 708 is not meshed.  Volume will be generated without elements.
 Lines at bottom lid used to be here

 Mesh Volumes

 Mesh the CS Tubes

 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=      24.000   TIME= 12:57:43
Meshing of volume 49 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    49 WITH EXCESSIVE ASPECT RATIO ***
          121     122     123     136     137     138     151     152
          153     166     167     168     181     182     183     196
          197     198     211     212     213     226     227     228


*** WARNING ***                         CP=      24.210   TIME= 12:57:43
Meshing of volume 50 produced 60 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
          241     242     243     244     245     246     247     248
          249     250     251     252     253     254     255     256
          257     258     259     260     261     262     263     264
          265     266     267     268     269     270     271     272
          273     274     275     276     277     278     279     280
          281     282     283     284     285     286     287     288
          289     290     291     292     293     294     295     296
          297     298     299     300


*** WARNING ***                         CP=      25.530   TIME= 12:57:44
Meshing of volume 54 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    54 WITH EXCESSIVE ASPECT RATIO ***
          661     662     663     676     677     678     691     692
          693     706     707     708     721     722     723     736
          737     738     751     752     753     766     767     768


*** WARNING ***                         CP=      25.740   TIME= 12:57:45
```

Meshing of volume 55 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 55 WITH EXCESSIVE ASPECT RATIO ***

781	782	783	784	785	786	787	788
789	790	791	792	793	794	795	796
797	798	799	800	801	802	803	804
805	806	807	808	809	810	811	812
813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828
829	830	831	832	833	834	835	836
837	838	839	840				

*** WARNING *** CP= 26.280 TIME= 12:57:45
Meshing of volume 57 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 57 WITH EXCESSIVE ASPECT RATIO ***

961	962	963	964	965	966	967	968
969	970	971	972	973	974	975	976
977	978	979	980	981	982	983	984
985	986	987	988	989	990	991	992
993	994	995	996	997	998	999	1000
1001	1002	1003	1004	1005	1006	1007	1008
1009	1010	1011	1012	1013	1014	1015	1016
1017	1018	1019	1020				

*** WARNING *** CP= 27.600 TIME= 12:57:46
Meshing of volume 61 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 61 WITH EXCESSIVE ASPECT RATIO ***

1381	1382	1383	1396	1397	1398	1411	1412
1413	1426	1427	1428	1441	1442	1443	1456
1457	1458	1471	1472	1473	1486	1487	1488

*** WARNING *** CP= 27.810 TIME= 12:57:47
Meshing of volume 62 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 62 WITH EXCESSIVE ASPECT RATIO ***

1501	1502	1503	1504	1505	1506	1507	1508
1509	1510	1511	1512	1513	1514	1515	1516
1517	1518	1519	1520	1521	1522	1523	1524
1525	1526	1527	1528	1529	1530	1531	1532
1533	1534	1535	1536	1537	1538	1539	1540
1541	1542	1543	1544	1545	1546	1547	1548
1549	1550	1551	1552	1553	1554	1555	1556
1557	1558	1559	1560				

*** WARNING *** CP= 28.350 TIME= 12:57:47
Meshing of volume 64 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 64 WITH EXCESSIVE ASPECT RATIO ***

1681	1682	1683	1684	1685	1686	1687	1688
1689	1690	1691	1692	1693	1694	1695	1696
1697	1698	1699	1700	1701	1702	1703	1704
1705	1706	1707	1708	1709	1710	1711	1712
1713	1714	1715	1716	1717	1718	1719	1720
1721	1722	1723	1724	1725	1726	1727	1728
1729	1730	1731	1732	1733	1734	1735	1736
1737	1738	1739	1740				

*** WARNING *** CP= 29.690 TIME= 12:57:48

```
 Meshing of volume 68 produced 24 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    68 WITH EXCESSIVE ASPECT RATIO ***
          2101    2102    2103    2116    2117    2118    2131    2132
          2133    2146    2147    2148    2161    2162    2163    2176
          2177    2178    2191    2192    2193    2206    2207    2208


 *** WARNING ***                          CP=     29.900   TIME= 12:57:49
 Meshing of volume 69 produced 60 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
          2221    2222    2223    2224    2225    2226    2227    2228
          2229    2230    2231    2232    2233    2234    2235    2236
          2237    2238    2239    2240    2241    2242    2243    2244
          2245    2246    2247    2248    2249    2250    2251    2252
          2253    2254    2255    2256    2257    2258    2259    2260
          2261    2262    2263    2264    2265    2266    2267    2268
          2269    2270    2271    2272    2273    2274    2275    2276
          2277    2278    2279    2280


 NUMBER OF VOLUMES MESHED    =     24
 MAXIMUM NODE NUMBER         =   4000
 MAXIMUM ELEMENT NUMBER      =   2520
  Mesh End Guides

 SELECT       FOR ITEM=VOLU COMPONENT=
  IN RANGE      72 TO       86 STEP        1

    15  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ELEMENT TYPE SET TO      3

 MATERIAL NUMBER SET TO     3

 GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

 *** WARNING ***                          CP=     31.250   TIME= 12:57:50
 Meshing of volume 72 produced 8 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    72 WITH EXCESSIVE ASPECT RATIO ***
          2521    2536    2551    2566    2581    2596    2611    2626


 *** WARNING ***                          CP=     31.470   TIME= 12:57:50
 Meshing of volume 73 produced 52 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    73 WITH EXCESSIVE ASPECT RATIO ***
          2641    2642    2643    2644    2645    2646    2647    2648
          2649    2650    2651    2652    2653    2654    2655    2656
          2657    2658    2659    2660    2661    2662    2663    2664
          2665    2666    2671    2672    2673    2674    2675    2676
          2677    2678    2679    2680    2681    2682    2683    2684
          2685    2686    2687    2688    2689    2690    2691    2692
          2693    2694    2695    2696


 *** WARNING ***                          CP=     31.810   TIME= 12:57:51
 Meshing of volume 74 produced 24 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

      *** LIST OF ELEMENTS IN VOLUME    74 WITH EXCESSIVE ASPECT RATIO ***
          2701    2702    2703    2716    2717    2718    2731    2732
          2733    2746    2747    2748    2761    2762    2763    2776
          2777    2778    2791    2792    2793    2806    2807    2808
```

*** WARNING *** CP= 31.910 TIME= 12:57:51
Volume 75 area 75 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 31.920 TIME= 12:57:51
Volume 75 area 380 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 32.140 TIME= 12:57:51
Meshing of volume 75 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 75 WITH EXCESSIVE DISTORTION ***

2881	2882	2883	2884	2885	2886	2887	2888
2889	2890	2891	2892	2893	2894	2895	2896
2897	2898	2899	2900	2901	2902	2903	2904
2905	2906	2907	2908	2909	2910	2911	2912
2913	2914	2915	2916	2917	2918	2919	2920
2921	2922	2923	2924	2925	2926	2927	2928
2929	2930	2931	2932	2933	2934	2935	2936
2937	2938	2939	2940				

*** WARNING *** CP= 32.250 TIME= 12:57:51
Volume 76 area 76 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 32.260 TIME= 12:57:51
Volume 76 area 384 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 32.480 TIME= 12:57:51
Meshing of volume 76 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 76 WITH EXCESSIVE DISTORTION ***

2941	2942	2945	2946	2949	2950	2953	2954
2957	2958	2961	2962	2965	2966	2969	2970
2973	2974	2977	2978	2981	2982	2985	2986
2989	2990	2993	2994	2997	2998	3001	3002
3005	3006	3009	3010	3013	3014	3017	3018
3021	3022	3025	3026	3029	3030	3033	3034
3037	3038	3041	3042	3045	3046	3049	3050
3053	3054	3057	3058				

*** WARNING *** CP= 32.700 TIME= 12:57:52
Meshing of volume 77 produced 52 elements with excessive aspect ratio. Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 77 WITH EXCESSIVE ASPECT RATIO ***

3061	3062	3063	3064	3065	3066	3067	3068
3069	3070	3071	3072	3073	3074	3075	3076
3077	3078	3079	3080	3081	3082	3083	3084
3085	3086	3091	3092	3093	3094	3095	3096
3097	3098	3099	3100	3101	3102	3103	3104
3105	3106	3107	3108	3109	3110	3111	3112
3113	3114	3115	3116				

*** WARNING *** CP= 33.020 TIME= 12:57:52
Meshing of volume 78 produced 24 elements with excessive aspect ratio. Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 78 WITH EXCESSIVE ASPECT RATIO ***

3121	3122	3123	3124	3125	3126	3151	3152
3153	3154	3155	3156	3181	3182	3183	3184
3185	3186	3211	3212	3213	3214	3215	3216

*** WARNING *** CP= 33.590 TIME= 12:57:52
Meshing of volume 80 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 80 WITH EXCESSIVE ASPECT RATIO ***

3361	3362	3363	3364	3365	3366	3367	3368
3369	3370	3371	3372	3373	3374	3375	3376
3377	3378	3379	3380	3381	3382	3383	3384
3385	3386	3391	3392	3393	3394	3395	3396
3397	3398	3399	3400	3401	3402	3403	3404
3405	3406	3407	3408	3409	3410	3411	3412
3413	3414	3415	3416				

*** WARNING *** CP= 33.900 TIME= 12:57:53
Meshing of volume 81 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 81 WITH EXCESSIVE ASPECT RATIO ***

3421	3422	3423	3424	3425	3426	3451	3452
3453	3454	3455	3456	3481	3482	3483	3484
3485	3486	3511	3512	3513	3514	3515	3516

*** WARNING *** CP= 34.010 TIME= 12:57:53
Volume 82 area 82 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 34.020 TIME= 12:57:53
Volume 82 area 404 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 34.250 TIME= 12:57:53
Meshing of volume 82 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 82 WITH EXCESSIVE DISTORTION ***

3543	3544	3547	3548	3551	3552	3555	3556
3559	3560	3563	3564	3567	3568	3571	3572
3575	3576	3579	3580	3583	3584	3587	3588
3591	3592	3595	3596	3599	3600	3603	3604
3607	3608	3611	3612	3615	3616	3619	3620
3623	3624	3627	3628	3631	3632	3635	3636
3639	3640	3643	3644	3647	3648	3651	3652
3655	3656	3659	3660				

*** WARNING *** CP= 34.360 TIME= 12:57:53
Volume 83 area 83 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 34.370 TIME= 12:57:53
Volume 83 area 408 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 34.590 TIME= 12:57:53
Meshing of volume 83 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 83 WITH EXCESSIVE DISTORTION ***

3721	3722	3723	3724	3725	3726	3727	3728
3729	3730	3731	3732	3733	3734	3735	3736
3737	3738	3739	3740	3741	3742	3743	3744
3745	3746	3747	3748	3749	3750	3751	3752
3753	3754	3755	3756	3757	3758	3759	3760
3761	3762	3763	3764	3765	3766	3767	3768
3769	3770	3771	3772	3773	3774	3775	3776
3777	3778	3779	3780				

*** WARNING *** CP= 34.810 TIME= 12:57:54
Meshing of volume 84 produced 52 elements with excessive aspect ratio.

```
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         3781    3782    3783    3784    3785    3786    3787    3788
         3789    3790    3791    3792    3793    3796    3797    3798
         3799    3800    3801    3802    3803    3804    3805    3806
         3807    3808    3811    3812    3813    3814    3815    3816
         3817    3818    3819    3820    3821    3822    3823    3826
         3827    3828    3829    3830    3831    3832    3833    3834
         3835    3836    3837    3838


*** WARNING ***                          CP=     35.150   TIME= 12:57:54
Meshing of volume 85 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    85 WITH EXCESSIVE ASPECT RATIO ***
         3841    3842    3843    3856    3857    3858    3871    3872
         3873    3886    3887    3888    3901    3902    3903    3916
         3917    3918    3931    3932    3933    3946    3947    3948


*** WARNING ***                          CP=     35.490   TIME= 12:57:54
Meshing of volume 86 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    86 WITH EXCESSIVE ASPECT RATIO ***
         3961    3976    3991    4006    4021    4036    4051    4066


NUMBER OF VOLUMES MESHED   =     15
MAXIMUM NODE NUMBER        =   6448
MAXIMUM ELEMENT NUMBER     =   4080
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP       1

    6  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     36.190   TIME= 12:57:55
Meshing of volume 88 produced 55 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
         4201    4202    4203    4204    4205    4206    4207    4208
         4209    4210    4211    4212    4213    4214    4215    4216
         4217    4218    4219    4220    4221    4222    4223    4224
         4225    4226    4227    4228    4231    4232    4233    4234
         4235    4236    4237    4238    4239    4240    4241    4242
         4243    4244    4245    4246    4247    4248    4249    4250
         4251    4252    4253    4254    4255    4256    4258


*** WARNING ***                          CP=     37.070   TIME= 12:57:56
Meshing of volume 91 produced 55 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
         4501    4502    4503    4504    4505    4506    4507    4508
         4509    4510    4511    4512    4513    4514    4515    4516
         4517    4518    4519    4520    4521    4522    4523    4524
         4525    4526    4527    4528    4531    4532    4533    4534
         4535    4536    4537    4538    4539    4540    4541    4542
```

```
        4543    4544    4545    4546    4547    4548    4549    4550
        4551    4552    4553    4554    4555    4556    4557


NUMBER OF VOLUMES MESHED   =      6
MAXIMUM NODE NUMBER        =   7280
MAXIMUM ELEMENT NUMBER     =   4680
 Mesh Inner Barrier

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.71295
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP       1

   177  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.69095     AND  0.71295
  KABS=  0.  TOLERANCE= 0.000000E+00

   114  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
  KABS=  0.  TOLERANCE= 0.000000E+00

  197  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP       1

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
  KABS=  0.  TOLERANCE= 0.000000E+00

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.10000E-01 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  147  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      5

MATERIAL NUMBER SET TO     5

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     41.100   TIME= 12:58:00
Meshing of volume 93 produced 48 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    93 WITH EXCESSIVE ASPECT RATIO ***
         4681    4682    4683    4684    4685    4686    4696    4697
         4698    4699    4700    4701    4711    4712    4713    4714
         4715    4716    4726    4727    4728    4729    4730    4731
         4741    4742    4743    4744    4745    4746    4756    4757
         4758    4759    4760    4761    4771    4772    4773    4774
         4775    4776    4786    4787    4788    4789    4790    4791
```

*** WARNING *** CP= 41.320 TIME= 12:58:00
Meshing of volume 94 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 94 WITH EXCESSIVE ASPECT RATIO ***

4801	4802	4803	4804	4805	4806	4807	4808
4809	4810	4811	4812	4813	4814	4815	4816
4817	4818	4819	4820	4821	4822	4823	4824
4825	4826	4827	4828	4829	4830	4831	4832
4833	4834	4835	4836	4837	4838	4839	4840
4841	4842	4843	4844	4845	4846	4847	4848
4849	4850	4851	4852	4853	4854	4855	4856
4857	4858	4859	4860				

*** WARNING *** CP= 41.750 TIME= 12:58:01
Meshing of volume 95 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 95 WITH EXCESSIVE ASPECT RATIO ***

4861	4862	4863	4864	4865	4866	4891	4892
4893	4894	4895	4896	4921	4922	4923	4924
4925	4926	4951	4952	4953	4954	4955	4956

*** WARNING *** CP= 41.960 TIME= 12:58:01
Meshing of volume 96 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 96 WITH EXCESSIVE ASPECT RATIO ***

4981	4982	4983	4984	4985	4986	4987	4988
4989	4990	4991	4992	4993	4994	4995	4996
4997	4998	4999	5000	5001	5002	5003	5004
5005	5006	5011	5012	5013	5014	5015	5016
5017	5018	5019	5020	5021	5022	5023	5024
5025	5026	5027	5028	5029	5030	5031	5032
5033	5034	5035	5036				

*** WARNING *** CP= 42.170 TIME= 12:58:01
Meshing of volume 97 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 97 WITH EXCESSIVE ASPECT RATIO ***

5041	5042	5043	5044	5045	5046	5047	5048
5049	5050	5051	5052	5053	5054	5055	5056
5057	5058	5059	5060	5061	5062	5063	5064
5065	5066	5067	5068	5069	5070	5071	5072
5073	5074	5075	5076	5077	5078	5079	5080
5081	5082	5083	5084	5085	5086	5087	5088
5089	5090	5091	5092	5093	5094	5095	5096
5097	5098	5099	5100				

*** WARNING *** CP= 42.610 TIME= 12:58:01
Meshing of volume 98 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 98 WITH EXCESSIVE ASPECT RATIO ***

5101	5102	5131	5132	5161	5162	5191	5192

*** WARNING *** CP= 42.820 TIME= 12:58:02
Meshing of volume 99 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 99 WITH EXCESSIVE ASPECT RATIO ***

5221	5222	5223	5224	5225	5226	5227	5228

5229	5230	5231	5232	5233	5234	5235	5236
5237	5238	5239	5240	5241	5242	5243	5244
5245	5246	5247	5248	5249	5250	5251	5252
5253	5254	5255	5256	5257	5258	5259	5260
5261	5262	5263	5264	5265	5266	5267	5268
5269	5270	5271	5272	5273	5274	5275	5276
5277	5278	5279	5280				

*** WARNING *** CP= 43.030 TIME= 12:58:02
Meshing of volume 100 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 100 WITH EXCESSIVE ASPECT RATIO ***

5281	5282	5283	5284	5285	5286	5287	5288
5289	5290	5291	5292	5293	5294	5295	5296
5297	5298	5299	5300	5301	5302	5303	5304
5305	5306	5311	5312	5313	5314	5315	5316
5317	5318	5319	5320	5321	5322	5323	5324
5325	5326	5327	5328	5329	5330	5331	5332
5333	5334	5335	5336				

*** WARNING *** CP= 43.460 TIME= 12:58:02
Meshing of volume 101 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 101 WITH EXCESSIVE ASPECT RATIO ***

5341	5342	5343	5344	5345	5346	5371	5372
5373	5374	5375	5376	5401	5402	5403	5404
5405	5406	5431	5432	5433	5434	5435	5436

*** WARNING *** CP= 43.680 TIME= 12:58:03
Meshing of volume 102 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 102 WITH EXCESSIVE ASPECT RATIO ***

5461	5462	5463	5464	5465	5466	5467	5468
5469	5470	5471	5472	5473	5474	5475	5476
5477	5478	5479	5480	5481	5482	5483	5484
5485	5486	5487	5488	5489	5490	5491	5492
5493	5494	5495	5496	5497	5498	5499	5500
5501	5502	5503	5504	5505	5506	5507	5508
5509	5510	5511	5512	5513	5514	5515	5516
5517	5518	5519	5520				

*** WARNING *** CP= 44.110 TIME= 12:58:03
Meshing of volume 103 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 103 WITH EXCESSIVE ASPECT RATIO ***

5521	5522	5523	5524	5525	5526	5551	5552
5553	5554	5555	5556	5581	5582	5583	5584
5585	5586	5611	5612	5613	5614	5615	5616

*** WARNING *** CP= 44.740 TIME= 12:58:04
Meshing of volume 119 produced 16 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 119 WITH EXCESSIVE ASPECT RATIO ***

5697	5698	5699	5700	5701	5702	5703	5704
5705	5706	5707	5708	5709	5710	5711	5712

*** WARNING *** CP= 45.860 TIME= 12:58:05
Meshing of volume 140 produced 16 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

```
     *** LIST OF ELEMENTS IN VOLUME   140 WITH EXCESSIVE ASPECT RATIO ***
         5825    5826    5827    5828    5829    5830    5831    5832
         5833    5834    5835    5836    5837    5838    5839    5840


*** WARNING ***                         CP=     47.730   TIME= 12:58:07
Volume 173 area 612 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     47.740   TIME= 12:58:07
Volume 173 area 871 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     47.770   TIME= 12:58:07
Meshing of volume 173 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   173 WITH EXCESSIVE DISTORTION ***
         6039    6040


*** WARNING ***                         CP=     48.980   TIME= 12:58:08
Volume 189 area 628 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     48.980   TIME= 12:58:08
Volume 189 area 935 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.010   TIME= 12:58:08
Meshing of volume 189 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   189 WITH EXCESSIVE DISTORTION ***
         6167    6168


*** WARNING ***                         CP=     49.140   TIME= 12:58:08
Volume 191 area 630 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.150   TIME= 12:58:08
Volume 191 area 943 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.170   TIME= 12:58:08
Meshing of volume 191 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   191 WITH EXCESSIVE DISTORTION ***
         6183    6184


*** WARNING ***                         CP=     49.910   TIME= 12:58:09
Volume 201 area 640 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.920   TIME= 12:58:09
Volume 201 area 983 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.940   TIME= 12:58:09
Meshing of volume 201 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   201 WITH EXCESSIVE DISTORTION ***
         6263    6264


*** WARNING ***                         CP=     52.260   TIME= 12:58:11
Volume 230 area 669 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.
```

```
*** WARNING ***                         CP=     52.270   TIME= 12:58:11
Volume 230 area 1058 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.310   TIME= 12:58:11
Meshing of volume 230 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   230 WITH EXCESSIVE DISTORTION ***
         6657    6658    6659    6660    6661    6662    6663    6664


*** WARNING ***                         CP=     52.350   TIME= 12:58:11
Volume 231 area 670 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.360   TIME= 12:58:11
Volume 231 area 1061 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.410   TIME= 12:58:11
Meshing of volume 231 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   231 WITH EXCESSIVE DISTORTION ***
         6665    6666    6669    6670    6673    6674    6677    6678


*** WARNING ***                         CP=     52.900   TIME= 12:58:12
Volume 237 area 676 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.910   TIME= 12:58:12
Volume 237 area 1078 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.960   TIME= 12:58:12
Meshing of volume 237 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   237 WITH EXCESSIVE DISTORTION ***
         6747    6748    6751    6752    6755    6756    6759    6760


*** WARNING ***                         CP=     53.020   TIME= 12:58:12
Volume 238 area 677 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.030   TIME= 12:58:12
Volume 238 area 1081 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.070   TIME= 12:58:12
Meshing of volume 238 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   238 WITH EXCESSIVE DISTORTION ***
         6769    6770    6771    6772    6773    6774    6775    6776


*** WARNING ***                         CP=     54.750   TIME= 12:58:14
Volume 255 area 694 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     54.760   TIME= 12:58:14
Volume 255 area 1119 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     54.820   TIME= 12:58:14
Meshing of volume 255 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   255 WITH EXCESSIVE DISTORTION ***
         7121    7122    7123    7124    7125    7126    7127    7128
         7130    7132    7134    7136    7138    7142
```

```
*** WARNING ***                          CP=     55.470   TIME= 12:58:14
Volume 261 area 700 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     55.480   TIME= 12:58:14
Volume 261 area 1125 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     55.540   TIME= 12:58:14
Meshing of volume 261 produced 14 elemerts with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   261 WITH EXCESSIVE DISTORTION ***
         7306    7310    7313    7314    7317    7318    7321    7322
         7323    7324    7325    7326    7327    7328


*** WARNING ***                          CP=     55.650   TIME= 12:58:15
Meshing of volume 262 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   262 WITH EXCESSIVE DISTORTION ***
         7338    7342


*** WARNING ***                          CP=     56.140   TIME= 12:58:15
Meshing of volume 266 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   266 WITH EXCESSIVE DISTORTION ***
         7458    7462


*** WARNING ***                          CP=     56.160   TIME= 12:58:15
Volume 267 area 706 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.180   TIME= 12:58:15
Volume 267 area 1131 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.240   TIME= 12:58:15
Meshing of volume 267 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   267 WITH EXCESSIVE DISTORTION ***
         7474    7478    7481    7482    7485    7486    7489    7490
         7491    7492    7493    7494    7495    7496


*** WARNING ***                          CP=     56.430   TIME= 12:58:15
Volume 269 area 708 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.450   TIME= 12:58:15
Volume 269 area 1133 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.510   TIME= 12:58:15
Meshing of volume 269 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   269 WITH EXCESSIVE DISTORTION ***
         7529    7530    7531    7532    7533    7534    7535    7536
         7538    7540    7542    7544    7546    7550


NUMBER OF VOLUMES MESHED   =    147
MAXIMUM NODE NUMBER        =  11541
MAXIMUM ELEMENT NUMBER     =   7552
 Mesh Upper Inner Barrier Adding Backfill Mass

INVERT       FOR ITEM=VOLU COMPONENT=
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```
  IN RANGE       1 TO      269 STEP       1

   122  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 UNSELECT      FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.71295      AND  0.78095
   KABS=  0.  TOLERANCE= 0.000000E+00

    122  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 RESELECT      FOR ITEM=LOC  COMPONENT=Z      BETWEEN 0.00000E+00 AND   2.3075
   KABS=  0.  TOLERANCE= 0.000000E+00

   122  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 UNSELECT      FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       92 STEP       1

    30  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 ELEMENT TYPE SET TO      6

 MATERIAL NUMBER SET TO     6

 GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

 *** WARNING ***                          CP=     57.350   TIME= 12:58:16
 Meshing of volume 104 produced 60 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   104 WITH EXCESSIVE ASPECT RATIO ***
         7553    7554    7555    7556    7557    7558    7559    7560
         7561    7562    7563    7564    7565    7566    7567    7568
         7569    7570    7571    7572    7573    7574    7575    7576
         7577    7578    7579    7580    7581    7582    7583    7584
         7585    7586    7587    7588    7589    7590    7591    7592
         7593    7594    7595    7596    7597    7598    7599    7600
         7601    7602    7603    7604    7605    7606    7607    7608
         7609    7610    7611    7612


 *** WARNING ***                          CP=     57.790   TIME= 12:58:17
 Meshing of volume 105 produced 24 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   105 WITH EXCESSIVE ASPECT RATIO ***
         7613    7614    7615    7616    7617    7618    7643    7644
         7645    7646    7647    7648    7673    7674    7675    7676
         7677    7678    7703    7704    7705    7706    7707    7708


 *** WARNING ***                          CP=     58.010   TIME= 12:58:17
 Meshing of volume 106 produced 52 elements with excessive aspect ratio.
   Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   106 WITH EXCESSIVE ASPECT RATIO ***
         7733    7734    7735    7736    7737    7738    7739    7740
         7741    7742    7743    7744    7745    7746    7747    7748
         7749    7750    7751    7752    7753    7754    7755    7756
         7757    7758    7763    7764    7765    7766    7767    7768
         7769    7770    7771    7772    7773    7774    7775    7776
         7777    7778    7779    7780    7781    7782    7783    7784
         7785    7786    7787    7788


 *** WARNING ***                          CP=     58.230   TIME= 12:58:17
 Meshing of volume 107 produced 60 elements with excessive aspect ratio.
```

Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 107 WITH EXCESSIVE ASPECT RATIO ***

7793	7794	7795	7796	7797	7798	7799	7800
7801	7802	7803	7804	7805	7806	7807	7808
7809	7810	7811	7812	7813	7814	7815	7816
7817	7818	7819	7820	7821	7822	7823	7824
7825	7826	7827	7828	7829	7830	7831	7832
7833	7834	7835	7836	7837	7838	7839	7840
7841	7842	7843	7844	7845	7846	7847	7848
7849	7850	7851	7852				

*** WARNING *** CP= 58.670 TIME= 12:58:18
Meshing of volume 108 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 108 WITH EXCESSIVE ASPECT RATIO ***

7853	7854	7883	7884	7913	7914	7943	7944

*** WARNING *** CP= 58.890 TIME= 12:58:18
Meshing of volume 109 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 109 WITH EXCESSIVE ASPECT RATIO ***

7973	7974	7975	7976	7977	7978	7979	7980
7981	7982	7983	7984	7985	7986	7987	7988
7989	7990	7991	7992	7993	7994	7995	7996
7997	7998	7999	8000	8001	8002	8003	8004
8005	8006	8007	8008	8009	8010	8011	8012
8013	8014	8015	8016	8017	8018	8019	8020
8021	8022	8023	8024	8025	8026	8027	8028
8029	8030	8031	8032				

*** WARNING *** CP= 59.110 TIME= 12:58:18
Meshing of volume 110 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 110 WITH EXCESSIVE ASPECT RATIO ***

8033	8034	8035	8036	8037	8038	8039	8040
8041	8042	8043	8044	8045	8046	8047	8048
8049	8050	8051	8052	8053	8054	8055	8056
8057	8058	8063	8064	8065	8066	8067	8068
8069	8070	8071	8072	8073	8074	8075	8076
8077	8078	8079	8080	8081	8082	8083	8084
8085	8086	8087	8088				

*** WARNING *** CP= 59.540 TIME= 12:58:18
Meshing of volume 111 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 111 WITH EXCESSIVE ASPECT RATIO ***

8093	8094	8095	8096	8097	8098	8123	8124
8125	8126	8127	8128	8153	8154	8155	8156
8157	8158	8183	8184	8185	8186	8187	8188

*** WARNING *** CP= 59.750 TIME= 12:58:19
Meshing of volume 112 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 112 WITH EXCESSIVE ASPECT RATIO ***

8213	8214	8215	8216	8217	8218	8219	8220
8221	8222	8223	8224	8225	8226	8227	8228
8229	8230	8231	8232	8233	8234	8235	8236
8237	8238	8239	8240	8241	8242	8243	8244
8245	8246	8247	8248	8249	8250	8251	8252

```
        8253    8254    8255    8256    8257    8258    8259    8260
        8261    8262    8263    8264    8265    8266    8267    8268
        8269    8270    8271    8272


*** WARNING ***                         CP=     60.130   TIME= 12:58:19
Meshing of volume 113 produced 48 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   113 WITH EXCESSIVE ASPECT RATIO ***
        8273    8274    8275    8276    8277    8278    8279    8280
        8281    8282    8283    8284    8303    8304    8305    8306
        8307    8308    8309    8310    8311    8312    8313    8314
        8333    8334    8335    8336    8337    8338    8339    8340
        8341    8342    8343    8344    8363    8364    8365    8366
        8367    8368    8369    8370    8371    8372    8373    8374


*** WARNING ***                         CP=     60.630   TIME= 12:58:20
Meshing of volume 129 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   129 WITH EXCESSIVE ASPECT RATIO ***
        8433    8434    8435    8436    8437    8438    8439    8440
        8441    8442    8443    8444    8445    8446    8447    8448


*** WARNING ***                         CP=     61.520   TIME= 12:58:20
Meshing of volume 150 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   150 WITH EXCESSIVE ASPECT RATIO ***
        8545    8546    8547    8548    8549    8550    8551    8552
        8553    8554    8555    8556    8557    8558    8559    8560


NUMBER OF VOLUMES MESHED   =     30
MAXIMUM NODE NUMBER        =  12897
MAXIMUM ELEMENT NUMBER     =   8616
 Mesh Lower Outer Barrier and Lids
 mesh upper outer barrier adding backfill mass

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   555  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     62.300   TIME= 12:58:21
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   555

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   606  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   Z
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     62.710   TIME= 12:58:22
Nodes on symmetry surfaces are rotated into coordinate system 0.
```

```
TOTAL SPECIFIED CONSTRAINTS=  1161
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z      BETWEEN  1.0675      AND   1.5450
  KABS=  0.  TOLERANCE= 0.000000E+00

  1818  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.71195      AND  0.71395
  KABS=  0.  TOLERANCE= 0.000000E+00

   246  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y      BETWEEN -70.000      AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    30  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   12897 BY        1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       269 STEP        1

   269  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO      1133 STEP        1

 1133  AREAS (OF  1133  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO      1604 STEP        1

 1604  LINES (OF  1604  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO      9001 STEP        1

   690  KEYPOINTS (OF    690  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO      8616 STEP        1

  8616  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT   FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO     12897 STEP        1

 12897  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
 FOR POSSIBLE RESUME FROM THIS POINT


***** ROUTINE COMPLETED *****  CP =         71.380


*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A MODAL ANALYSIS
```

```
 THIS WILL BE A NEW ANALYSIS


USE SUBSPACE ITERATION METHOD
 EXTRACT    8 MODES
 NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****

*** WARNING ***                         CP=     80.830   TIME= 12:58:43
Element 2881 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.830   TIME= 12:58:43
Element 2881 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2882 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2882 has an angle between adjacent edges of 139.585464 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2883 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2883 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2884 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.840   TIME= 12:58:43
Element 2884 has an angle between adjacent edges of 139.585464 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.850   TIME= 12:58:43
Element 2885 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.850   TIME= 12:58:43
Element 2885 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     80.850   TIME= 12:58:43
Element 2886 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

*** WARNING *** CP= 80.850 TIME= 12:58:43
Element 2886 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.850 TIME= 12:58:43
Element 2887 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.850 TIME= 12:58:43
Element 2887 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.860 TIME= 12:58:43
Element 2888 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.860 TIME= 12:58:43
Element 2888 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.860 TIME= 12:58:43
Element 2889 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.860 TIME= 12:58:43
Element 2889 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.860 TIME= 12:58:43
Element 2890 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.870 TIME= 12:58:43
Element 2890 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.870 TIME= 12:58:43
Element 2891 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.870 TIME= 12:58:43
Element 2891 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.870 TIME= 12:58:43
Element 2892 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.870 TIME= 12:58:43
Element 2892 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2893 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2893 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2894 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2894 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2895 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.880 TIME= 12:58:43
Element 2895 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2896 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2896 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2897 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2897 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2898 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.890 TIME= 12:58:43
Element 2898 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2899 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2899 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2900 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2900 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2901 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.900 TIME= 12:58:43
Element 2901 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2902 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2902 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2903 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2903 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2904 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.910 TIME= 12:58:43
Element 2904 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2905 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2905 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2906 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2906 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2907 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.920 TIME= 12:58:43
Element 2907 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2908 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2908 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2909 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2909 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2910 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.930 TIME= 12:58:43
Element 2910 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2911 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2911 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2912 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2912 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2913 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.940 TIME= 12:58:43
Element 2913 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.950 TIME= 12:58:43
Element 2914 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.950 TIME= 12:58:43
Element 2914 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.950 TIME= 12:58:43
Element 2915 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.950 TIME= 12:58:43
Element 2915 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.950 TIME= 12:58:43
Element 2916 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.960 TIME= 12:58:43
Element 2916 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.960 TIME= 12:58:43
Element 2917 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.960 TIME= 12:58:43
Element 2917 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.960 TIME= 12:58:43
Element 2918 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.960 TIME= 12:58:43
Element 2918 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2919 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2919 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2920 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2920 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2921 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2921 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2922 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.970 TIME= 12:58:43
Element 2922 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.980 TIME= 12:58:43
Element 2923 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.980 TIME= 12:58:43
Element 2923 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.980 TIME= 12:58:43
Element 2924 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.980 TIME= 12:58:43
Element 2924 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.980 TIME= 12:58:43
Element 2925 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2925 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2926 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2926 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2927 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2927 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 80.990 TIME= 12:58:43
Element 2928 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2928 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2929 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2929 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2930 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2930 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.000 TIME= 12:58:43
Element 2931 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.010 TIME= 12:58:43
Element 2931 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.010 TIME= 12:58:43
Element 2932 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.010 TIME= 12:58:43
Element 2932 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.010 TIME= 12:58:43
Element 2933 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.010 TIME= 12:58:43
Element 2933 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2934 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2934 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2935 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2935 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2936 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.020 TIME= 12:58:43
Element 2936 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2937 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2937 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2938 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2938 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2939 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.030 TIME= 12:58:43
Element 2939 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2940 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2940 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2941 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2941 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2942 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.040 TIME= 12:58:43
Element 2942 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.050 TIME= 12:58:43
Element 2945 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.050 TIME= 12:58:43
Element 2945 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.050 TIME= 12:58:43
Element 2946 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.050 TIME= 12:58:43
Element 2946 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.050 TIME= 12:58:43
Element 2949 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.060 TIME= 12:58:43
Element 2949 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.060 TIME= 12:58:43
Element 2950 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.060 TIME= 12:58:43
Element 2950 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.060 TIME= 12:58:43
Element 2953 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.060 TIME= 12:58:43
Element 2953 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.070 TIME= 12:58:43
Element 2954 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.070 TIME= 12:58:43
Element 2954 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.070 TIME= 12:58:43
Element 2957 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.070 TIME= 12:58:43
Element 2957 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.070 TIME= 12:58:43
Element 2958 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.080 TIME= 12:58:43
Element 2958 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.080 TIME= 12:58:43
Element 2961 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.080 TIME= 12:58:43
Element 2961 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.080 TIME= 12:58:43
Element 2962 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.080 TIME= 12:58:43
Element 2962 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.090 TIME= 12:58:43
Element 2965 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.090 TIME= 12:58:43
Element 2965 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.090 TIME= 12:58:43
Element 2966 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.090 TIME= 12:58:43
Element 2966 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.090 TIME= 12:58:43
Element 2969 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.100 TIME= 12:58:43
Element 2969 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.100 TIME= 12:58:43
Element 2970 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.100 TIME= 12:58:43
Element 2970 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.100 TIME= 12:58:43
Element 2973 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.100 TIME= 12:58:43
Element 2973 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2974 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2974 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2977 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2977 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2978 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2978 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.110 TIME= 12:58:43
Element 2981 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.120 TIME= 12:58:43
Element 2981 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.120 TIME= 12:58:43
Element 2982 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.120 TIME= 12:58:43
Element 2982 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.120 TIME= 12:58:43
Element 2985 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.120 TIME= 12:58:43
Element 2985 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.130 TIME= 12:58:43
Element 2986 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.130 TIME= 12:58:43
Element 2986 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.130 TIME= 12:58:43
Element 2989 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.130 TIME= 12:58:43
Element 2989 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.130 TIME= 12:58:43
Element 2990 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.140 TIME= 12:58:43
Element 2990 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.140 TIME= 12:58:43
Element 2993 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.140 TIME= 12:58:43
Element 2993 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.140 TIME= 12:58:43
Element 2994 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.140 TIME= 12:58:43
Element 2994 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.150 TIME= 12:58:43
Element 2997 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.150 TIME= 12:58:43
Element 2997 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.150 TIME= 12:58:43
Element 2998 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 81.150 TIME= 12:58:43
Element 2998 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.150 TIME= 12:58:43
Element 3001 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.160 TIME= 12:58:43
Element 3001 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.160 TIME= 12:58:43
Element 3002 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.160 TIME= 12:58:43
Element 3002 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.160 TIME= 12:58:43
Element 3005 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.160 TIME= 12:58:43
Element 3005 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.170 TIME= 12:58:43
Element 3006 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.170 TIME= 12:58:43
Element 3006 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.170 TIME= 12:58:43
Element 3009 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.170 TIME= 12:58:43
Element 3009 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.170 TIME= 12:58:43
Element 3010 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.180 TIME= 12:58:43
Element 3010 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 81.180 TIME= 12:58:43
Element 3013 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

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*** WARNING ***                         CP=     81.180   TIME= 12:58:43
Element 3013 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.180   TIME= 12:58:43
Element 3014 has an angle between adjacent edges of 139.536079 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.180   TIME= 12:58:43
Element 3014 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.190   TIME= 12:58:43
Element 3017 has an angle between adjacent edges of 40.4639215 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.190   TIME= 12:58:43
Element 3017 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.190   TIME= 12:58:43
Element 3018 has an angle between adjacent edges of 139.536079 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     81.190   TIME= 12:58:43
Element 3018 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*****************************************************************************
Error messages discontinued after 200 messages were displayed.
 More may exist.  See ( seism4.err ) for suppressed messages.
*****************************************************************************

*** NOTE ***                            CP=     85.080   TIME= 12:58:47
The model data was checked and warning messages were found.
 Please review output or errors file ( seism4.err ) for these warning
 messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   12:58:47  APR 10, 1996 CP=     85.080
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
  NUMBER OF MODES TO EXTRACT. . . . . .     8

                    L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1


          ***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****
```

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

TOTAL MASS = 11180.

CENTROID		MOM. OF INERTIA ABOUT ORIGIN		MOM. OF INERTIA ABOUT CENTROID	
XC =	0.32883	IXX =	0.2183E+05	IXX =	6342.
YC =	0.22505	IYY =	0.2153E+05	IYY =	5397.
ZC =	1.1553	IZZ =	3642.	IZZ =	1866.
		IXY =	-882.5	IXY =	-55.14
		IYZ =	-2903.	IYZ =	3.806
		IZX =	-4250.	IZX =	-2.669

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
2	5469.41
3	343.834
4	184.329
5	115.124
6	5067.35

Range of element maximum matrix coefficients in global coordinates
Maximum= 5.450155848E+11 at element 5101.
Minimum= 180090805 at element 6499.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	14.440	0.006
3	1560	SOLID45	8.950	0.006
4	600	SOLID45	3.410	0.006
5	2872	SOLID45	16.460	0.006
6	1064	SOLID45	6.140	0.006

Time at end of element matrix formulation CP= 143.89.

Estimated number of active DOF= 37500.
Maximum wavefront= 1397.

Time at end of matrix triangularization CP= 223.89.

SUBSPACE SIZE OF 12 VECTORS USED FOR CALCULATION OF FIRST 8 EIGENVECTORS.
MAXIMUM ITERATIONS = 100
NUMBER OF EQUATIONS = 37500
MAXIMUM WAVEFRONT = 1397
ITERATIONS PER SHIFT = 5
MAXIMUM MODES STORED = 12
MAXIMUM EIGENVALUE = 0.10000E+07
WORK SPACE (MBYTE) = 8.0875

Equation solver maximum pivot= 1.42925125E+12 at node 8454 UX.

Equation solver minimum pivot= 1534691.43 at node 462 UY.

***** ITERATION 1 COMPLETE ***** CP= 2828.190 WALL= 14.0261

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	29.225644	0.00000000E+00	0.10000E+01
2	36.158733	0.00000000E+00	0.10000E+01
3	36.697562	0.00000000E+00	0.10000E+01
4	44.411658	0.00000000E+00	0.10000E+01
5	51.589724	0.00000000E+00	0.10000E+01
6	54.879415	0.00000000E+00	0.10000E+01
7	58.488854	0.00000000E+00	0.10000E+01
8	63.235331	0.00000000E+00	0.10000E+01

9	71.737678	0.00000000E+00	0.10000E+01
10	72.851765	0.00000000E+00	0.10000E+01
11	76.885706	0.00000000E+00	0.10000E+01
12	84.023723	0.00000000E+00	0.10000E+01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 1
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2429.270
CP TIME SINCE LAST SHIFT= 171.100

***** ITERATION 2 COMPLETE ***** CP= 3000.620 WALL= 14.1572

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.627792	29.225644	0.82601E+00
2	28.810143	36.158733	0.57520E+00
3	29.667772	36.697562	0.53005E+00
4	34.152366	44.411658	0.69103E+00
5	35.951837	51.589724	0.10591E+01
6	38.114521	54.879415	0.10732E+01
7	41.469631	58.488854	0.98923E+00
8	45.094896	63.235331	0.96637E+00
9	49.657400	71.737678	0.10870E+01
10	53.274522	72.851765	0.87000E+00
11	55.086147	76.885706	0.94808E+00
12	56.590370	84.023723	0.12045E+01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2429.270
CP TIME SINCE LAST SHIFT= 343.530

***** ITERATION 3 COMPLETE ***** CP= 3172.000 WALL= 14.2875

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.525997	21.627792	0.94802E-02
2	28.427651	28.810143	0.27091E-01
3	28.826165	29.667772	0.59244E-01
4	32.120792	34.152366	0.13050E+00
5	33.693934	35.951837	0.13851E+00
6	35.663076	38.114521	0.14220E+00
7	37.957871	41.469631	0.19359E+00
8	42.795276	45.094896	0.11036E+00
9	46.355949	49.657400	0.14751E+00
10	49.612548	53.274522	0.15307E+00
11	50.340188	55.086147	0.19744E+00
12	52.086998	56.590370	0.18039E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2429.270
CP TIME SINCE LAST SHIFT= 514.920

***** ITERATION 4 COMPLETE ***** CP= 3344.280 WALL= 14.4228

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.523438	21.525997	0.23783E-03
2	28.400760	28.427651	0.18946E-02
3	28.684128	28.826165	0.99281E-02
4	30.507540	32.120792	0.10856E+00
5	33.621896	33.693934	0.42897E-02
6	35.479242	35.663076	0.10390E-01
7	37.287892	37.957871	0.36258E-01
8	40.982746	42.795276	0.90409E-01
9	43.732626	46.355949	0.12357E+00
10	47.061992	49.612548	0.11133E+00
11	48.594890	50.340188	0.73120E-01
12	51.458515	52.086998	0.24576E-01

ITERATIONS SINCE LAST SHIFT= 4
TOTAL NUMBER OF ITERATIONS= 4
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2429.270
CP TIME SINCE LAST SHIFT= 687.190

***** ITERATION 5 COMPLETE ***** CP= 3516.510 WALL= 14.5567

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.523367	21.523438	0.66305E-05
2	28.398119	28.400760	0.18600E-03
3	28.658769	28.684128	0.17705E-02
4	30.085551	30.507540	0.28249E-01
5	33.608241	33.621896	0.81280E-03
6	35.424289	35.479242	0.31050E-02
7	36.837192	37.287892	0.24620E-01
8	39.415112	40.982746	0.81127E-01
9	42.816958	43.732626	0.43229E-01
10	44.865624	47.061992	0.10031E+00
11	48.230860	48.594890	0.15152E-01
12	51.111705	51.458515	0.13617E-01

ITERATIONS SINCE LAST SHIFT= 5
TOTAL NUMBER OF ITERATIONS= 5
NUMBER OF MODES CONVERGED= 1
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2429.270
CP TIME SINCE LAST SHIFT= 859.420

*** NOTE *** CP= 3516.520 TIME= 14:33:24
NEW SHIFT= 28.0943635.

*** NOTE *** CP= 6005.910 TIME= 15:33:13
STURM number= 1 should be 1.

***** ITERATION 6 COMPLETE ***** CP= 6147.980 WALL= 15.6611

****** PREVIOUS CONVERGED EIGENVALUES *****
1 21.5233666

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
2	28.397737	28.398119	0.26862E-04
3	28.654161	28.658769	0.32167E-03
4	29.972235	30.085551	0.75757E-02
5	33.604964	33.608241	0.19505E-03

6	35.379536	35.424289	0.25315E-02
7	36.394935	36.837192	0.24451E-01
8	38.581253	39.415112	0.43693E-01
9	42.331602	42.816958	0.23063E-01
10	43.145654	44.865624	0.81318E-01
11	48.029034	48.230860	0.84220E-02
12	50.753920	51.111705	0.14149E-01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 6
NUMBER OF MODES CONVERGED= 1
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 28.094
CP TIME FOR TRIANGULARIZATION= 2489.660
CP TIME SINCE LAST SHIFT= 141.800

***** ITERATION 7 COMPLETE ***** CP= 6292.840 WALL= 15.7658

****** PREVIOUS CONVERGED EIGENVALUES *****
1 21.5233666

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
2	28.397737	28.397737	0.39508E-08
3	28.654159	28.654161	0.13833E-06
4	29.971520	29.972235	0.47694E-04
5	33.604829	33.604964	0.80203E-05
6	35.371872	35.379536	0.43337E-03
7	36.322644	36.394935	0.39845E-02
8	38.451295	38.581253	0.67710E-02
9	42.160094	42.331602	0.81526E-02
10	42.570925	43.145654	0.27183E-01
11	47.942638	48.029034	0.36074E-02
12	50.449028	50.753920	0.12124E-01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 7
NUMBER OF MODES CONVERGED= 3
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 28.094
CP TIME FOR TRIANGULARIZATION= 2489.660
CP TIME SINCE LAST SHIFT= 286.670

***** ITERATION 8 COMPLETE ***** CP= 6427.870 WALL= 15.8703

****** PREVIOUS CONVERGED EIGENVALUES *****
1 21.5233666 2 28.3977373 3 28.6541590

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
4	29.971517	29.971520	0.24119E-06
5	33.604823	33.604829	0.35971E-06
6	35.371108	35.371872	0.43225E-04
7	36.314455	36.322644	0.45104E-03
8	38.429671	38.451295	0.11257E-02
9	42.093428	42.160094	0.31701E-02
10	42.392804	42.570925	0.84211E-02
11	47.897545	47.942638	0.18838E-02
12	50.155094	50.449028	0.11755E-01

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 8
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 28.094
CP TIME FOR TRIANGULARIZATION= 2489.660

```
CP TIME SINCE LAST SHIFT=        421.690


    *****  ITERATION    9  COMPLETE *****  CP=     6557.360  WALL=      15.9783

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  21.5233666            2  28.3977373            3  28.6541590
       4  29.9715167            5  33.6048227

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   6     35.371040          35.371108          0.38307E-05
   7     36.313584          36.314455          0.47955E-04
   8     38.426055          38.429671          0.18823E-03
   9     42.069743          42.093428          0.11263E-02
  10     42.332423          42.392804          0.28547E-02
  11     47.870620          47.897545          0.11252E-02
  12     49.854811          50.155094          0.12083E-01

ITERATIONS SINCE LAST SHIFT=      4
TOTAL NUMBER OF ITERATIONS=       9
NUMBER OF MODES CONVERGED=        6
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=             28.094
CP TIME FOR TRIANGULARIZATION=  2489.660
CP TIME SINCE LAST SHIFT=        551.180


    *****  ITERATION   10  COMPLETE *****  CP=     6679.680  WALL=      16.0814

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  21.5233666            2  28.3977373            3  28.6541590
       4  29.9715167            5  33.6048227            6  35.3710398

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   7     36.313492          36.313584          0.50648E-05
   8     38.425453          38.426055          0.31338E-04
   9     42.061798          42.069743          0.37780E-03
  10     42.309411          42.332423          0.10881E-02
  11     47.853010          47.870620          0.73613E-03
  12     49.540579          49.854811          0.12726E-01

ITERATIONS SINCE LAST SHIFT=      5
TOTAL NUMBER OF ITERATIONS=      10
NUMBER OF MODES CONVERGED=        7
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=             28.094
CP TIME FOR TRIANGULARIZATION=  2489.660
CP TIME SINCE LAST SHIFT=        673.500

*** NOTE ***                          CP=   6679.680   TIME= 16:04:53
NEW SHIFT= 38.3226191.

*** NOTE ***                          CP=   9257.360   TIME= 17:18:11
STURM number= 7 should be 7.


    *****  ITERATION   11  COMPLETE *****  CP=     9375.160  WALL=      17.4075

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  21.5233666            2  28.3977373            3  28.6541590
       4  29.9715167            5  33.6048227            6  35.3710398
       7  36.3134924

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
```

```
   8     38.425333         38.425453         0.62227E-05

 *** NOTE ***                            CP=   9375.160   TIME= 17:24:27
 NEW SHIFT= 38.8039263.

 *** NOTE ***                            CP=  11963.510   TIME= 18:36:46
 STURM number= 8 should be 8.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   18:36:49  APR 10, 1996 CP=  11963.950
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)


    1       21.523367
    2       28.397737
    3       28.654159
    4       29.971517
    5       33.604823
    6       35.371040
    7       36.313492
    8       38.425333


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37500
  R.M.S. WAVEFRONT SIZE =   902.2


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096
       44.625 MB WRITTEN ON ELEMENT MATRIX FILE: seism4.emat
       29.703 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism4.esav
       21.094 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism4.full
        2.719 MB WRITTEN ON MODAL MATRIX FILE: seism4.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =     11971.010


 *****  ANSYS SOLUTION ROUTINE  *****


 PERFORM AN EXPANSION PASS


 NUMBER OF MODES TO EXPAND=     8
  CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   18:37:10  APR 10, 1996 CP=  11971.010
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill

                    S O L U T I O N   O P T I O N S
```

```
   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .MODAL
      EXTRACTION METHOD. . . . . .SUBSPACE
      EXPANSION PASS . . . . . .ON
   NUMBER OF MODES TO EXPAND . . . . . 8
   ELEMENT RESULTS CALCULATION . . . . . .ON

                    L O A D   S T E P   O P T I O N S

   LOAD STEP NUMBER. . . . . 1
   PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
   DATABASE OUTPUT CONTROLS
      ITEM      FREQUENCY    COMPONENT
       ALL         ALL

*** NOTE ***                                CP=  12000.130   TIME= 18:38:28
Page file used.

  *** ELEMENT RESULT CALCULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       9.450    0.004
    3    1560  SOLID45       5.890    0.004
    4     600  SOLID45       2.340    0.004
    5    2872  SOLID45      11.110    0.004
    6    1064  SOLID45       4.020    0.004

  *** NODAL LOAD CALCULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       0.980    0.000
    3    1560  SOLID45       0.590    0.000
    4     600  SOLID45       0.100    0.000
    5    2872  SOLID45       0.990    0.000
    6    1064  SOLID45       0.310    0.000

*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
     106.109 MB WRITTEN ON RESULTS FILE: seism4.rst

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED *****  CP =      12270.770


*****  ANSYS SOLUTION ROUTINE  *****

PERFORM A SPECTRUM ANALYSIS
 THIS WILL BE A NEW ANALYSIS

*** NOTE ***                                CP=  12270.770   TIME= 18:50:46
Some analysis options have been reset to their defaults.  Please verify
 current settings or respecify as required.


USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
 USE ALL MODES FROM THE MODAL ANALYSIS
 INCLUDE STRESS RESPONSES IN THE CALCULATIONS

SEISMIC EXCITATION DIRECTION = 0.00000E+00  1.0000      0.00000E+00

SPECTRUM TYPE KEY=  2  FACTOR=  1.00000
```

```
 FREQ= 0.100      100.     0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
 NUMBER OF FREQUENCIES IN TABLE =  2

 DAMPING= 0.00000E+00  SV=     16.285          16.285         0.00000E+00
                           0.00000E+00     0.00000E+00     0.00000E+00
                           0.00000E+00     0.00000E+00     0.00000E+00


 COMBINE MODES USING THE SRSS METHOD
  WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

 WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
   FOR ALL APPLICABLE ENTITIES

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
  FOR POSSIBLE RESUME FROM THIS POINT

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   18:51:24  APR 10, 1996 CP=  12284.310
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


                     S O L U T I O N   O P T I O N S

   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .SPECTRUM
      SPECTRUM TYPE. . . . . .SINGLE POINT
   NUMBER OF MODES TO BE USED. . . . . .     8
   ELEMENT RESULTS CALCULATION . . . . . .ON

                   L O A D   S T E P   O P T I O N S

   LOAD STEP NUMBER. . . . . .     1
   SPECTRUM LOADING TYPE . . . . . .ACCELERATION
   EXCITATION DIRECTION. . . . . 0.00000E+00  1.0000      0.00000E+00
   MODE COMBINATION TYPE . . . . . .SRSS
      SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
   PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
   DATABASE OUTPUT CONTROLS
      ITEM      FREQUENCY    COMPONENT
       ALL         ALL

1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   18:51:38  APR 10, 1996 CP=  12288.500
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


    SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07


       SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

  MODE     FREQUENCY     DAMPING       SV          MODE COEF.

    1        21.52         0.0000   16.285        -0.4898E-02
    2        28.40         0.0000   16.285         0.4076E-01
    3        28.65         0.0000   16.285         0.2971E-02
    4        29.97         0.0000   16.285         0.2051E-03
    5        33.60         0.0000   16.285         0.5948E-02
    6        35.37         0.0000   16.285         0.1042E-02
```

```
   7       36.31          0.0000  16.285          -0.1785E-03
   8       38.43          0.0000  16.285           0.1629E-03

                  MODAL COMBINATION COEFFICIENTS

          MODE=   1  FREQUENCY=      21.523  COUPLING COEF.=   1.000
          MODE=   2  FREQUENCY=      28.398  COUPLING COEF.=   1.000
          MODE=   3  FREQUENCY=      28.654  COUPLING COEF.=   1.000
          MODE=   4  FREQUENCY=      29.972  COUPLING COEF.=   1.000
          MODE=   5  FREQUENCY=      33.605  COUPLING COEF.=   1.000
          MODE=   6  FREQUENCY=      35.371  COUPLING COEF.=   1.000
          MODE=   7  FREQUENCY=      36.313  COUPLING COEF.=   1.000
          MODE=   8  FREQUENCY=      38.425  COUPLING COEF.=   1.000

SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE seism4.mcom


  *** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37500
 R.M.S. WAVEFRONT SIZE =   902.2


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      12288.520


PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
 FOR POSSIBLE RESUME FROM THIS POINT


NUMBER OF WARNING MESSAGES ENCOUNTERED=        1042
NUMBER OF ERROR   MESSAGES ENCOUNTERED=           0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=          790
MAXIMUM RECORD NUMBER   =          599
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       37.438

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                      HP 9000/7XX            |
|                                                                        |
|       CP TIME      (sec) =      12297.830       TIME  =  18:51:58      |
|       ELAPSED TIME (sec) =      21281.000       DATE  =  04/10/96      |
|                                                                        |
*------------------------------------------------------------------------*
```

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*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
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 PRESS <CR> OR <ENTER> TO CONTINUE


         ***** ANSYS COMMAND LINE ARGUMENTS *****
  INITIAL JOBNAME            = postf4
  MEMORY REQUESTED (MB)      =     64.0
  BATCH MODE REQUESTED       = LIST
  START-UP FILE MODE         = READ

*** NOTE ***                                CP=      0.180   TIME= 19:24:00
There are no parameters and no abbreviations defined.

38303             VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postf4    19:24:00  APR 10, 1996 CP=      0.190

    1  resume,seism4,db
    2  /filnam,seism4
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /out,seism4,res
    7  /com, 100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
    8  /com,  90% Degradation of Inner Barrier
    9  /com,
   10  /com,
   11  /com, MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER
   12  /com,
   13  /com, No Outer Barrier
   14  !esel,s,type,,6,7
   15  !nsle
   16  !esln
   17  !set,1,5
   18  !nsort,s,int,0,0,1
   19  !prns,s,prin
   20
   21  /com,
   22  /com,
   23  /com, MAXIMUM STRESS INTENSITY IN THE INNER BARRIER
   24  /com,
   25  /com,
   26  esel,s,type,,5,6
   27  nsle
   28  esln
   29  nsort,s,int,0,0,1
   30  prns,s,prin
   31
   32  /com,
   33  /com,
   34  /com, MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES
   35  /com,
   36  /com,
   37  esel,s,type,,1
   38  esel,a,type,,3,4
   39  nsle
   40  esln
   41  nsort,s,int,0,0,1
   42  prns,s,prin
   43
   44  /com,
   45  /com,
   46  /com, MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES
   47  /com,
   48  /com,
   49  esel,s,type,,2
   50  nsle
```

```
   51  esln
   52  nsort,s,int,0,0,1
   53  prns,s,prin
   54
   55  /out
   56  fini
   57  /exit,nosave
   58  /eof

 RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

 /INPUT FILE= /ansys51/docu/start.ans  LINE=       0

 ABBREVIATION= REPLOT    /REPLOT

 PARAMETER PI       =     3.141593
    ****************************************************************
    ANSYS STARTUP FILE  start.ans
    ****************************************************************

 ABBREVIATION= VEC       /show,,,1,

 ABBREVIATION= RAS       /show,,,0,

 ABBREVIATION= INP       /input,,inp,

 ABBREVIATION= ESC       /exit,nosav,

 ABBREVIATION= K1        /pnum,kp  ,1,

 ABBREVIATION= K0        /pnum,kp  ,0,

 ABBREVIATION= L1        /pnum,line,1,

 ABBREVIATION= L0        /pnum,line,0,

 ABBREVIATION= A1        /pnum,area,1,

 ABBREVIATION= A0        /pnum,area,0,

 ABBREVIATION= V1        /pnum,volu,1,

 ABBREVIATION= V0        /pnum,volu,0,

 ABBREVIATION= N1        /pnum,node,1,

 ABBREVIATION= N0        /pnum,node,0,

 ABBREVIATION= E1        /pnum,elem,1,

 ABBREVIATION= E0        /pnum,elem,0,

 ABBREVIATION= M1        /pnum,mat ,1,

 ABBREVIATION= M0        /pnum,mat ,0,

 ABBREVIATION= R1        /pnum,real,1,

 ABBREVIATION= R0        /pnum,real,0,

 ABBREVIATION= T1        /pnum,type,1,

 ABBREVIATION= T0        /pnum,type,0,

 ABBREVIATION= C1        /number,1,

 ABBREVIATION= C0        /number,0,

 ABBREVIATION= PR1       /psf,pres,norm,1,
```

```
 ABBREVIATION= PRO       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ***********************************************************************
    END  start.ans
    ***********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ***********************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism4.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER        =       6
 ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS       =    1191

 INITIAL JOBNAME = postf4
 CURRENT JOBNAME = postf4

 CURRENT JOBNAME REDEFINED AS seism4
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   19:24:12  APR 10, 1996 CP=      5.860
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


          ***** ANSYS RESULTS INTERPRETATION (POST1) *****


 USE LOAD STEP      1  SUBSTEP      5  FOR LOAD CASE 0

 *** NOTE ***                            CP=       7.550   TIME= 19:24:16
 Page file used.

 SET COMMAND GOT LOAD STEP=      1  SUBSTEP=      5  CUMULATIVE ITERATION=      5
   TIME/FREQUENCY=  33.605
```

```
 TITLE=  21 PWR Tube Seismic Analysis With Backfill

 /INPUT FILE= seism4.mcom  LINE=       0
 ANSYS REVISION  5.1              24     18:51:38     04/10/1996
  seism4.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.48984E-02

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                                CP=     32.870   TIME= 19:25:29
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.40757E-01

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.40757E-01 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.40757E-01 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.29710E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.29710E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.29710E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.20511E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.20511E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.20511E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.59476E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.59476E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.59476E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.10421E-02
```

```
LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.10421E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.10421E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.17849E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.17849E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.17849E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.16293E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.16293E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.16293E-03 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE

/OUTPUT FILE= seism4.res

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       118.860


EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        15583
MAXIMUM RECORD NUMBER   =          554
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       34.625

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =        118.910     TIME  =  19:30:25        |
|       ELAPSED TIME (sec) =        387.000     DATE  =  04/10/96        |
|                                                                        |
*------------------------------------------------------------------------*
```

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```
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AFTER YOU HAVE READ AND UNDERSTAND THE PREVIOUS DISCLAIMER,
PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME           = postlin4
 MEMORY REQUESTED (MB)     =     64.0
 BATCH MODE REQUESTED      = LIST
 START-UP FILE MODE        = READ

*** NOTE ***                            CP=      0.170   TIME= 19:32:04
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postlin4  19:32:04  APR 10, 1996 CP=      0.170

    1  resume,seism4,db
    2  /filnam,seism4
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /com, Outer Barrier Stress Distribution
    7  !nsel,s,node,,13294
    8  !nsel,a,node,,13367
    9  !nsel,a,node,,12430
   10  !nsel,a,node,,12503
   11  !nsel,a,node,,7840
   12  !esln
   13  !lpath,7840,13294
   14  !/out,obstress
   15  /com, Outer Barrier Linearized Stresses at Location of Peak Stress
   16  !prsect
   17  !/out
   18  !/show,obdist,grph
   19  !plsect,s,int
   20  !/show,term
   21  /com, Inner Barrier Stress Distribution
   22  nsel,s,node,,8632
   23  nsel,a,node,,8634
   24  nsel,a,node,,8626
   25  esln
   26  lpath,8632,8626
   27  /out,ibstress
   28  /com, Inner Barrier Linearized Stresses at Location of Peak Stress
   29  prsect
   30  /out
   31  /show,ibdist,grph
   32  plsect,s,int
   33  /show,term
   34  /com, Basket Stress Distribution
   35  nsel,s,node,,4355
   36  nsel,a,node,,4370
   37  nsel,a,node,,4293
   38  esln
   39  lpath,4355,4293
   40  /out,bktstress
   41  /com, Basket Tubes and Guides Linearized Stresses at Location of Peak Stress
   42  prsect
   43  /out
   44  /show,bktdist,grph
   45  plsect,s,int
   46  /show,term
   47  /com, Criticality Control Plate Stress Distribution
   48  nsel,s,node,,3878
   49  nsel,a,node,,3956
   50  nsel,a,node,,3830
```

```
   51  esln
   52  lpath,3878,3830
   53  /out,pltstress
   54  /com, Criticality Control Plates Linearized Stresses at Location of Peak Stress
   55  prsect
   56  /out
   57  /show,pltdist,grph
   58  plsect,s,int
   59  /show,term
   60  fini
   61  /exit,nosave

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =    3.141593
   ***********************************************************************
   ANSYS STARTUP FILE  start.ans
   ***********************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,
```

```
 ABBREVIATION= PR1       /psf,pres,norm,1,

 ABBREVIATION= PR0       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ****************************************************************
    END  start.ans
    ****************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ****************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism4.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER       =       6
 ACTIVE COORDINATE SYSTEM             =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS      =    1191

 INITIAL JOBNAME = postlin4
 CURRENT JOBNAME = postlin4

 CURRENT JOBNAME REDEFINED AS seism4
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   19:32:17  APR 10, 1996 CP=      5.900
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


         ***** ANSYS RESULTS INTERPRETATION (POST1) *****

 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 *** NOTE ***                            CP=       7.550   TIME= 19:32:20
 Page file used.
```

```
 SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
   TIME/FREQUENCY=  33.605
 TITLE=  21 PWR Tube Seismic Analysis With Backfill

 /INPUT FILE= seism4.mcom  LINE=       0
 ANSYS REVISION  5.1              24    18:51:38    04/10/1996
  seism4.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.48984E-02

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                            CP=     32.810   TIME= 19:33:30
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.40757E-01

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.40757E-01 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.40757E-01 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.29710E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.29710E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.29710E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.20511E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.20511E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.20511E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.59476E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.59476E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.59476E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill
```

```
LOAD CASE   1 FACTOR SET TO 0.10421E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.10421E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.10421E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.17849E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.17849E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.17849E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.16293E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.16293E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.16293E-03 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE
 Outer Barrier Stress Distribution
 Outer Barrier Linearized Stresses at Location of Peak Stress
 Inner Barrier Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    8632 TO     8632 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    8634 TO     8634 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    8626 TO     8626 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     8 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      8632  8626

/OUTPUT FILE= ibstress

/SHOW SWITCH PLOTS TO FILE ibdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE ibdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Basket Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    4355 TO     4355 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.
```

```
 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    4370 TO     4370 STEP        1

      2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    4293 TO     4293 STEP        1

      3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     10 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
      3 SELECTED NODES BY  ESLN COMMAND.

 DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
       4355  4293

 /OUTPUT FILE= bktstres

 /SHOW SWITCH PLOTS TO FILE bktdist.grph      - RASTER MODE.

 DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
  ITEM=S    COMP=INT RHO= 0.00000E+00

 CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE bktdist.grph      - RASTER MODE.
 DISPLAY TITLE=
  21 PWR Tube Seismic Analysis With Backfill
  Criticality Control Plate Stress Distribution

 SELECT       FOR ITEM=NODE COMPONENT=
  IN RANGE    3878 TO     3878 STEP        1

      1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    3956 TO     3956 STEP        1

      2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    3830 TO     3830 STEP        1

      3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

      4 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
      3 SELECTED NODES BY  ESLN COMMAND.

 DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
       3878  3830

 /OUTPUT FILE= pltstres

 /SHOW SWITCH PLOTS TO FILE pltdist.grph      - RASTER MODE.

 DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
  ITEM=S    COMP=INT RHO= 0.00000E+00

 CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE pltdist.grph      - RASTER MODE.
 DISPLAY TITLE=
  21 PWR Tube Seismic Analysis With Backfill

 EXIT THE ANSYS POST1 DATABASE PROCESSOR


 ***** ROUTINE COMPLETED *****  CP =       112.800
```

```
EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=         14517
MAXIMUM RECORD NUMBER   =           529
RECORD SIZE (I*4 WORDS) =         16384
PAGE FILE SIZE (MB)     =        33.063

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =         112.810     TIME  =  19:39:22       |
|       ELAPSED TIME (sec) =         439.000     DATE  =  04/10/96       |
|                                                                        |
*------------------------------------------------------------------------*
```

```
/COM,ANSYS REVISION  5.1              24    18:51:38    04/10/1996
/COM, seism4.mcom
LCOPER,ZERO
LCDEFI,1,     1,     1
LCFACT,1, -0.489840E-02
LCASE,1
LCOPER,SQUARE
LCDEFI,1,     1,     2
LCFACT,1,  0.407565E-01
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     3
LCFACT,1,  0.297098E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     4
LCFACT,1,  0.205114E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     5
LCFACT,1,  0.594764E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     6
LCFACT,1,  0.104206E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     7
LCFACT,1, -0.178489E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     8
LCFACT,1,  0.162933E-03
LCOPER,ADD,1,MULT,1
LCOPER,SQRT
```

```
*-------------------------------------------------------------------*
|                                                                   |
|          W E L C O M E   T O   T H E   A N S Y S   P R O G R A M   |
|                                                                   |
*-------------------------------------------------------------------*
```

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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = adjust
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.130   TIME= 08:41:31
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=adjust    08:41:31  APR 11, 1996 CP=      0.140

    1 /com,*********************************************************************
    2 /com,*********************************************************************
    3 /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4 /com,*****  Degree of Degradation in Outer Barrier: 100%                   *****
    5 /com,*****  Degree of Degradation in Inner Barrier:  90%                   *****
    6 /com,*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
    7 /com,*****                                             Guides 50%          *****
    8 /com,*****                                             SS-B Plates 0%      *****
    9 /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
   10 /com,*****  Quarter Symmetry Model                                         *****
   11 /com,*********************************************************************
   12 /com,*********************************************************************
   13 /com,*********************************************************************
   14 /config,nvpag,512
   15 /units,si
   16 /prep7
   17 /title, 21 PWR Tube Seismic Analysis With Backfill
   18 /vcon,,0
   19 /com, Define Parameters
   20 ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   21 obir=0.71295            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   22 obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   23 obor=0.78095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   24 ts1=.007                ! SS-B Plate Thickness
   25 ts2=.005                ! CS Tube Thickness
   26 ts3=.005                ! Corner Guide Thickness
   27 ts4=.005                ! End Guide Thickness
   28 egih=0.0855             ! End Guide Fin Inner Height(0.0809+0.005-2.5*tan10)
   29 pie=3.1415926           ! Pi
   30 ang1=30*pie/180         ! Angle on end of end guide
   31 ang2=80*pie/180         ! Angle on end of end guide fin
   32 ang3=58*pie/180         ! Angle on end of corner guide
   33 tw=0.2285               ! Tube Inner Side Width
   34 pos1=tw/2               ! Dimension to Keypoint Position 1
   35 pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   36 pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   37 pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   38 pos5=pos4+tw            ! Dimension to Keypoint Position 5
   39 pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   40 pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   41 pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   42 pos9=pos8+tw            ! Dimension to Keypoint Position 9
   43 pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   44 pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   45 posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   46 posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   47 poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   48 posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   49 posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   50 poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
```

```
51  poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
52  bkht=4.575/2                ! Basket Height (Half Height)
53  ibht=bkht+0.01               ! inner barrier cavity height
54  !bgh=ibht-bkht              ! Basket Gap Height
55  iblt=0.007                  ! inner lid height
56  elev1=ibht+iblt             ! Elevation of Top of Inner Barrier
57  ltlgh=0.030                 ! Lid to Lid Gap Height
58  elev2=elev1+ltlgh           ! Elevation of Bottom of Upper Outer Barrier Lid
59  oblt=0.06                   ! outer lid height
60  elev3=elev2+oblt            ! Elevation of Top of Upper Outer Barrier Lid
61  stht=0.225                  ! skirt height
62  elev4=elev3+stht            ! Elevation of Top of Waste Package
63  elev5=-(iblt+oblt)          ! Elevation of Bottom of Lower Outer Barrier Lid
64  elev6=elev5-stht            ! Elevation of Bottom of Waste Package
65  /com, Line Divisions
66  shd=1              ! Skirt Height Divisions
67  obld=1             ! Outer Barrier Lid Divisions
68  gd=2               ! Gap Divisions
69  ibld=2             ! Inner Barrier Lid Divisions
70  bd=15              ! Basket Divisions
71  htwd=4             ! Half Tube Width Divisions
72  twd=4              ! Tube Width Divisions
73  thd=4              ! Tube Height Divisions
74  egfd=4             ! End Guide Fin Divisions
75  ptd=2              ! Plate Thickness Divisions
76  ttd=1              ! Tube Thickness Divisions
77  a1d=4              ! Arc 1 Divisions
78  a2d=4              ! Arc 2 Divisions
79  a3d=4              ! Arc 3 Divisions
80  a4d=4              ! Arc 4 Divisions
81  a5d=4              ! Arc 5 Divisions
82  a6d=4              ! Arc 6 Divisions
83  a7d=4              ! Arc 7 Divisions
84  a8d=4              ! Arc 8 Divisions
85  a9d=4              ! Arc 9 Divisions
86  ibtd=2             ! Inner Barrier Thickness Divisions
87  obitd=2            ! Outer Barrier Inner Thickness Divisions
88  std=2              ! Skirt Thickness Divisions
89  /com, Define Element Properties
90  et,1,solid45       ! Carbon Steel Tube
91  et,2,solid45       ! Stainless Steel - Boron Plate
92  et,3,solid45       ! Carbon Steel End Guide
93  et,4,solid45       ! Carbon Steel Corner Guide
94  et,5,solid45       ! Alloy 625 Inner Barrier
95  et,6,solid45       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
96  !et,6,solid45      ! A 516 Carbon Steel Outer Barrier
97  !et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
98  /com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
99  /com, Room Temperature Properties of Materials
100 mp,ex,1,206e9       ! A516 Carbon Steel Tube
101 mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
102 mp,ex,3,206e9       ! A516 Carbon Steel End Guide
103 mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
104 mp,ex,5,208e9       ! Alloy 625 Inner Barrier
105 mp,ex,6,208e9       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
106 !mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
107 !mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
108 mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
109 mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
110 mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
111 mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
112 mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
113 mp,nuxy,6,0.278     ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
114 !mp,nuxy,6,0.3       ! A516 Carbon Steel Outer Barrier
115 !mp,nuxy,7,0.3       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
116 mp,dens,1,8131       ! A516 Carbon Steel Tube
117 mp,dens,2,7953       ! 316B6A Stainless Steel - Boron Plate (Adjusted to include tube and SNF masses)
118 mp,dens,3,16262      ! A516 Carbon Steel End Guide (Doubled for Corrosion Prod.)
119 mp,dens,4,16262      ! A516 Carbon Steel Corner Guide (Doubled for Corrosion)
120 mp,dens,5,8442      ! Alloy 625 Inner Barrier
```

```
121 mp,dens,6,1101960   ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
122 !mp,dens,6,8131     ! A516 Carbon Steel Outer Barrier
123 !mp,mu,7,0.57       ! Coefficient of Friction (Steel on Steel Assumed)
124 !tb,biso,1
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
126 !tb,biso,2
127 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
128 !tb,biso,3
129 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
130 !tb,biso,4
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
132 !tb,biso,5
133 !tbdata,,379e6,1.271e9  ! Alloy 625
134 !tb,biso,6
135 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
136 !tb,biso,7
137 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
138 /com
139 /com, Define keypoints in the basket assembly
140 csys,0
141 k,1,0,0
142 k,2,pos1,0
143 k,3,pos2,0
144 k,4,pos3,0
145 k,5,pos4,0
146 k,6,pos5,0
147 k,7,pos6,0
148 k,8,pos7,0
149 k,9,pos8,0
150 k,10,pos9,0
151 k,11,pos10,0
152 k,12,pos11,0
153 k,13,pos1,pos1
154 k,14,pos4,pos1
155 k,15,pos5,pos1
156 k,16,pos8,pos1
157 k,17,pos9,pos1
158 k,18,pos2,pos2
159 k,19,pos3,pos2
160 k,20,pos6,pos2
161 k,21,pos7,pos2
162 k,22,pos10,pos2
163 k,23,pos11,posen
164 !k,24,posei,posen
165 csys,1
166 k,24,ibir,(180/pie)*atan(posen/posei)
167 csys,0
168 k,25,pos3,pos3
169 k,26,pos6,pos3
170 k,27,pos7,pos3
171 k,28,pos10,pos3
172 k,29,pos11,posef
173 !k,30,poseo,posef
174 csys,1
175 k,30,ibir,(180/pie)*atan(posef/poseo)
176 csys,0
177 k,31,pos4,pos4
178 k,32,pos5,pos4
179 k,33,pos8,pos4
180 k,34,pos9,pos4
181 k,35,pos5,pos5
182 k,36,pos8,pos5
183 k,37,pos9,pos5
184 !k,38,pos11,poseg
185 csys,1
186 k,38,ibir,(180/pie)*atan(poseg/pos11)
187 csys,0
188 k,39,pos6,pos6
189 k,40,pos7,pos6
190 !k,41,pos10,pos6
```

```
csys,1
k,41,ibir,(180/pie)*atan(pos6/pos10)
csys,0
k,42,posg,posg
!k,43,poscg,posg
csys,1
k,43,ibir,(180/pie)*atan(posg/poscg)
k,44,ibir,0
k,45,ibir,45
k,46,obir,0
k,47,obir,(180/pie)*atan(posen/posei)
k,48,obir,(180/pie)*atan(posef/poseo)
k,49,obir,(180/pie)*atan(poseg/pos11)
k,50,obir,(180/pie)*atan(pos6/pos10)
k,51,obir,(180/pie)*atan(posg/poscg)
k,52,obir,45
k,53,obsr,0
k,54,obsr,(180/pie)*atan(posen/posei)
k,55,obsr,(180/pie)*atan(posef/poseo)
k,56,obsr,(180/pie)*atan(poseg/pos11)
k,57,obsr,(180/pie)*atan(pos6/pos'0)
k,58,obsr,(180/pie)*atan(posg/poscg)
k,59,obsr,45
k,60,obor,0
k,61,obor,(180/pie)*atan(posen/posei)
k,62,obor,(180/pie)*atan(posef/poseo)
k,63,obor,(180/pie)*atan(poseg/pos11)
k,64,obor,(180/pie)*atan(pos6/pos'0)
k,65,obor,(180/pie)*atan(posg/poscg)
k,66,obor,45
local,11,0,0,0,0,45,0,0,
ksymm,y,all,,,0,0,0
nummrg,kp
csys,0
ksymm,y,all,,,0,0,0
nummrg,kp
kdel,2,12,1
k,1001,0,0,bkht
l,1,1001              ! Line 1 for VDRAG of Basket
lesize,all,,,bd,.2,0
k,2001,0,0,ibht
l,1001,2001           ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
lesize,all,,,gd,1,0
k,3001,0,0,elev1
l,2001,3001           ! Line 3 for VDRAG of Inner Barrier Upper Lid
lesize,all,,,ibld,1,0
k,4001,0,0,elev2
l,3001,4001           ! Line 4 for VDRAG of Lid to Lid Gap
lesize,all,,,gd,1,0
k,5001,0,0,elev3
l,4001,5001           ! Line 5 for VDRAG of Outer Barrier Upper Lid
lesize,all,,,obld,1,0
k,6001,0,0,elev4
l,5001,6001           ! Line 6 for VDRAG of Upper Skirt
lesize,all,,,shd,1,0
k,7001,0,0,-iblt
l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
lesize,all,,,ibld,1,0
k,8001,0,0,elev5
l,7001,8001           ! Line 8 for VDRAG of OB Lower Lid
lesize,all,,,obld,1,0
k,9001,0,0,elev6
l,8001,9001           ! Line 9 for VDRAG of Lower Skirt
lesize,all,,,shd,1,0
/com, line set 1 Tube Width for Half Tubes on Symmetry Plane
L,      197,      206  ! Line 10
L,      196,      205
L,      195,      201
L,      194,      200
L,      193,      204
```

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  261  L,      192,      203
  262  L,      191,      199
  263  L,      190,      198
  264  L,      189,      202
  265  L,      188,      138
  266  L,      187,      133  ! 20
  267  L,       68,       13
  268  L,       69,       18
  269  L,       70,       85
  270  L,       71,       80
  271  L,       72,       81
  272  L,       73,       86
  273  L,       74,       87
  274  L,       75,       82
  275  L,       76,       83
  276  L,       77,       88  ! 30
  277  L,       78,       89
  278  lesize,all,,,htwd,1,0
  279  /com, line set 2 Tube Widths
  280  L,      211,      218
  281  L,      210,      220
  282  L,      215,      217
  283  L,      214,      216
  284  L,      209,      219
  285  L,      208,      159
  286  L,      213,      155
  287  L,      151,      152
  288  L,      145,      146  ! 40
  289  L,      139,      140
  290  L,      134,      135
  291  L,       14,       15
  292  L,       19,       20
  293  L,       25,       26
  294  L,       31,       32
  295  L,       98,       35
  296  L,       92,       39
  297  L,       93,      106
  298  L,       99,      102  ! 50
  299  L,      100,      103
  300  L,       94,      107
  301  L,       95,      104
  302  lesize,all,,,twd,1,0
  303  /com, line set 3 Tube Widths on End Column
  304  L,      162,      163
  305  L,      160,      161
  306  L,      156,      157
  307  L,      153,      154
  308  L,      147,      148
  309  L,      141,      142
  310  L,      136,      137  ! 60
  311  L,       16,       17
  312  L,       21,       22
  313  L,       27,       28
  314  L,       33,       34
  315  L,       36,       37
  316  L,       40,       41
  317  L,       42,       43
  318  lesize,all,,,twd,1,0
  319  /com, line set 4 Tube Heights
  320  L,      201,      200
  321  L,      205,      204
  322  L,      210,      209  ! 70
  323  L,      215,      214
  324  L,      217,      216
  325  L,      220,      219
  326  L,      221,      162
  327  L,      199,      198
  328  L,      203,      202
  329  L,      208,      145
  330  L,      213,      151
```

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 331  L,      155,      152
 332  L,      159,      146  ! 80
 333  L,      160,      147
 334  L,      156,      153
 335  L,      157,      154
 336  L,      161,      148
 337  L,      133,       13
 338  L,      138,       18
 339  L,      139,       19
 340  L,      134,       14
 341  L,      135,       15
 342  L,      140,       20  ! 90
 343  L,      141,       21
 344  L,      136,       16
 345  L,      137,       17
 346  L,      142,       22
 347  L,      143,       23
 348  L,       80,       81
 349  L,       85,       86
 350  L,       25,       92
 351  L,       31,       98
 352  L,       32,       35  ! 100
 353  L,       26,       39
 354  L,       27,       40
 355  L,       33,       36
 356  L,       34,       37
 357  L,       28,       41
 358  L,       29,       38
 359  L,       82,       83
 360  L,       87,       88
 361  L,       93,       94
 362  L,       99,      100  ! 110
 363  L,      102,      103
 364  L,      106,      107
 365  L,       42,      109
 366  L,      158,      149
 367  lesize,all,,,thd,1,0
 368  /com, line set 5 End Guide Fins
 369  L,      207,      206
 370  L,      212,      211
 371  L,      150,      149
 372  L,      144,      143
 373  L,       24,       23
 374  L,       30,       29  ! 120
 375  L,       96,       95
 376  L,       90,       89
 377  lesize,all,,,egfd,1,0
 378  /com, line set 6 SS-B Plate Thickness
 379  L,      197,      196
 380  L,      206,      205
 381  L,      211,      210
 382  L,      207,      212
 383  L,      206,      211
 384  L,      205,      210
 385  L,      218,      220
 386  L,      220,      221  ! 130
 387  L,      193,      192
 388  L,      204,      203
 389  L,      209,      208
 390  L,      204,      209
 391  L,      203,      208
 392  L,      219,      159
 393  L,      162,      160
 394  L,      163,      161
 395  L,      161,      158
 396  L,      219,      162  ! 140
 397  L,      159,      160
 398  L,      189,      188
 399  L,      202,      138
 400  L,      145,      139
```

```
401  L,     202,     145
402  L,     138,     139
403  L,     146,     140
404  L,     147,     141
405  L,     146,     147
406  L,     140,     141  ! 150
407  L,     148,     142
408  L,     149,     143
409  L,     148,     149
410  L,     142,     143
411  L,     150,     144
412  L,      69,      70
413  L,      18,      85
414  L,      19,      25
415  L,      18,      19
416  L,      85,      25  ! 160
417  L,      20,      26
418  L,      21,      27
419  L,      20,      21
420  L,      26,      27
421  L,      22,      28
422  L,      22,      23
423  L,      28,      29
424  L,      23,      29
425  L,      24,      30
426  L,      73,      74  ! 170
427  L,      86,      87
428  L,      92,      93
429  L,      86,      92
430  L,      87,      93
431  L,      39,     106
432  L,      40,      42
433  L,      39,      40
434  L,     106,      42
435  L,      38,      41
436  L,      41,      43  ! 180
437  L,      77,      78
438  L,      88,      89
439  L,      94,      95
440  L,      88,      94
441  L,      89,      95
442  L,      90,      96
443  L,     109,     107
444  L,     107,     104
445  L,     224,     225
446  L,     230,     231  ! 190
447  L,     236,     237
448  L,     226,     227
449  L,     227,     228
450  L,     232,     233
451  L,     233,     234
452  L,     238,     239
453  L,     239,     240
454  L,     171,     170
455  L,     170,     169
456  L,     178,     177  ! 200
457  L,     177,     176
458  L,     185,     184
459  L,     184,     183
460  L,     168,     167
461  L,     175,     174
462  L,     182,     181
463  L,      47,      48
464  L,      54,      55
465  L,      61,      62
466  L,      49,      50  ! 210
467  L,      50,      51
468  L,      56,      57
469  L,      57,      58
470  L,      63,      64
```

```
L,      64,      65
L,     117,     116
L,     116,     115
L,     124,     123
L,     123,     122
L,     131,     130  ! 220
L,     130,     129
L,     114,     113
L,     121,     120
L,     128,     127
lesize,all,,,ptd,1,0
/com, line set 7 tube thickness
L,     196,     195
L,     205,     201
L,     204,     200
L,     193,     194
L,     210,     215
L,     220,     217  ! 230
L,     219,     216
L,     209,     214
L,     192,     191
L,     203,     199
L,     202,     198
L,     189,     190
L,     208,     213
L,     159,     155
L,     146,     152
L,     145,     151  ! 240
L,     160,     156
L,     161,     157
L,     148,     154
L,     147,     153
L,     188,     187
L,     138,     133
L,      18,      13
L,      69,      68
L,     139,     134
L,     140,     135  ! 250
L,      20,      15
L,      19,      14
L,     141,     136
L,     142,     137
L,      22,      17
L,      21,      16
L,      70,      71
L,      85,      80
L,      86,      81
L,      73,      72  ! 260
L,      25,      31
L,      26,      32
L,      39,      35
L,      92,      98
L,      27,      33
L,      28,      34
L,      41,      37
L,      40,      36
L,      74,      75
L,      87,      82  ! 270
L,      88,      83
L,      77,      76
L,      93,      99
L,     106,     102
L,     107,     103
L,      94,     100
lesize,all,,,ttd,1,0
csys,1
/com, line set 8, arc 1 bottom
L,     222,     207
L,     223,     224
L,     229,     230
```

```
541  L,      235,      236  ! 280
542  lesize,all,,,a1d,1,0
543  /com, line set 9, arc 2 side arcs
544  L,      212,      218
545  L,      225,      226
546  L,      231,      232
547  L,      237,      238
548  lesize,all,,,a2d,1,0
549  /com, line set 10, arc 3 side arcs
550  L,      221,      163
551  L,      228,      171
552  L,      234,      178
553  L,      240,      185
554  lesize,all,,,a3d,1,0
555  /com, line set 11, arc 4 side arcs
556  L,      158,      150
557  L,      169,      168  ! 290
558  L,      176,      175
559  L,      183,      182
560  lesize,all,,,a4d,1,0
561  /com, line set 12, arc 5 side arcs
562  L,      144,       24
563  L,      167,       47
564  L,      174,       54
565  L,      181,       61
566  lesize,all,,,a5d,1,0
567  /com, line set 13, arc 6 side arcs
568  L,       30,       38
569  L,       48,       49
570  L,       55,       56
571  L,       62,       63  ! 300
572  lesize,all,,,a6d,1,0
573  /com, line set 14, arc 7 side arcs
574  L,       43,      109
575  L,       51,      117
576  L,       58,      124
577  L,       65,      131
578  lesize,all,,,a7d,1,0
579  /com, line set 15, arc 8 side arcs
580  L,      104,       96
581  L,      115,      114
582  L,      122,      121
583  L,      129,      128
584  lesize,all,,,a8d,1,0
585  /com, line set 16, arc 9 top arcs
586  L,       90,      110
587  L,      113,      112  ! 310
588  L,      120,      119
589  L,      127,      126
590  lesize,all,,,a9d,1,0
591  csys,0
592  /com, line set 17 IB thickness
593  L,      222,      223
594  L,      207,      224
595  L,      212,      225
596  L,      218,      226
597  L,      220,      227
598  L,      221,      228
599  L,      163,      171
600  L,      161,      170  ! 320
601  L,      158,      169
602  L,      150,      168
603  L,      144,      167
604  L,       24,       47
605  L,       30,       48
606  L,       38,       49
607  L,       41,       50
608  L,       43,       51
609  L,      109,      117
610  L,      107,      116  ! 330
```

```
611  L,     104,     115
612  L,      96,     114
613  L,      90,     113
614  L,     110,     112
615  lesize,all,,,ibtd,1,0
616  /com, line set 18 OB inner thickness
617  L,     223,     229
618  L,     224,     230
619  L,     225,     231
620  L,     226,     232
621  L,     227,     233
622  L,     228,     234  ! 340
623  L,     171,     178
624  L,     170,     177
625  L,     169,     176
626  L,     168,     175
627  L,     167,     174
628  L,      47,      54
629  L,      48,      55
630  L,      49,      56
631  L,      50,      57
632  L,      51,      58  ! 350
633  L,     117,     124
634  L,     116,     123
635  L,     115,     122
636  L,     114,     121
637  L,     113,     120
638  L,     112,     119
639  lesize,all,,,obitd,1,0
640  /com, line set 19 skirt thickness
641  L,     229,     235
642  L,     230,     236
643  L,     231,     237
644  L,     232,     238  ! 360
645  L,     233,     239
646  L,     234,     240
647  L,     178,     185
648  L,     177,     184
649  L,     176,     183
650  L,     175,     182
651  L,     174,     181
652  L,      54,      61
653  L,      55,      62
654  L,      56,      63  ! 370
655  L,      57,      64
656  L,      58,      65
657  L,     124,     131
658  L,     123,     130
659  L,     122,     129
660  L,     121,     128
661  L,     120,     127
662  L,     119,     126
663  lesize,all,,,std,1,0
664  /com, lines to fill in lids
665  /com, lines tube height
666  l,195,194             ! 379
667  l,191,190             ! 380
668  l,187,68              ! 381
669  l,71,72               ! 382
670  l,75,76               ! 383
671  lesize,all,,,thd,1,0
672  /com, end lines
673  l,222,197             ! 384
674  l,78,110              ! 385
675  lesize,all,,,egfd,1,0
676  /com, area set 1, tubes
677  a,195,196,205,201
678  a,200,201,205,204
679  a,193,194,200,204
680  a,191,192,203,199
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681  a,198,199,203,202
682  a,189,190,198,202
683  a,187,188,138,133
684  a,133,138,18,13
685  a,69,68,13,18
686  a,71,70,85,80
687  a,80,85,86,81
688  a,73,72,81,86
689  a,75,74,87,82
690  a,82,87,88,83
691  a,77,76,83,88
692  a,209,210,215,214
693  a,215,210,220,217
694  a,216,217,220,219
695  a,209,214,216,219
696  a,145,208,213,151
697  a,213,208,159,155
698  a,152,155,159,146
699  a,145,151,152,146
700  a,134,139,140,135
701  a,135,140,20,15
702  a,19,14,15,20
703  a,19,139,134,14
704  a,92,25,31,98
705  a,31,25,26,32
706  a,32,26,39,35
707  a,92,98,35,39
708  a,94,93,99,100
709  a,99,93,106,102
710  a,102,106,107,103
711  a,94,100,103,107
712  a,156,160,161,157
713  a,157,161,148,154
714  a,147,153,154,148
715  a,147,160,156,153
716  a,136,141,142,137
717  a,137,142,22,17
718  a,21,16,17,22
719  a,21,141,136,16
720  a,33,27,28,34
721  a,34,28,41,37
722  a,40,36,37,41
723  a,40,27,33,36
724  /com, area set 2, plates
725  a,204,205,210,209
726  a,192,193,204,203
727  a,203,204,209,208
728  a,208,209,219,159
729  a,202,203,208,145
730  a,146,159,160,147
731  a,188,189,202,138
732  a,138,202,145,139
733  a,139,145,146,140
734  a,140,146,147,141
735  a,141,147,148,142
736  a,18,138,139,19
737  a,20,140,141,21
738  a,70,69,18,85
739  a,85,18,19,25
740  a,25,19,20,26
741  a,26,20,21,27
742  a,27,21,22,28
743  a,86,85,25,92
744  a,39,26,27,40
745  a,74,73,86,87
746  a,87,86,92,93
747  a,93,92,39,106
748  a,88,87,93,94
749  /com, area set 3, end guides
750  a,196,197,206,205
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a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
a,159,219,162,160
a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
!a,223,229,230,224
!a,224,230,231,225
!a,225,231,232,226
!a,226,232,233,227
!a,227,233,234,228
!a,228,234,178,171
!a,171,178,177,170
!a,170,177,176,169
!a,169,176,175,168
!a,168,175,174,167
!a,167,174,54,47
!a,47,54,55,48
!a,48,55,56,49
!a,49,56,57,50
!a,50,57,58,51
!a,51,58,124,117
!a,117,124,123,116
!a,116,123,122,115
!a,115,122,121,114
!a,114,121,120,113
!a,113,120,119,112
!a,229,235,236,230
!a,236,237,231,230
!a,231,237,238,232
!a,238,239,233,232
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!a,239,240,234,233
!a,240,185,178,234
!a,185,184,177,178
!a,184,183,176,177
!a,176,183,182,175
!a,175,182,181,174
!a,174,181,61,54
!a,54,61,62,55
!a,55,62,63,56
!a,56,63,64,57
!a,57,64,65,58
!a,58,65,131,124
!a,124,131,130,123
!a,123,130,129,122
!a,122,129,128,121
!a,121,128,127,120
!a,120,127,126,119
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.01
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,0.01
nummrg,kp
/com, generate lines to fill in lid at top of WP
/com, lines tube height
L,414,421  ! 1121
L,422,429  ! 1124
L,430,437  ! 1125
L,438,445  ! 1131
L,446,453  ! 1138
lesize,all,,,thd,1,0
/com, end lines
L,370,518  ! 1141
L,539,413  ! 1151
lesize,all,,,egfd,1,0
al,832,1116,1120,1141
al,936,937,941,1121
al,946,947,951,1124
al,956,959,961,1125
al,966,969,971,1131
al,976,979,981,1138
al,932,1143,1147,1151
al,842,1122,1123
al,985,989,990,993
al,997,1001,1002,1005
al,1010,1013,1015,1018
al,1021,1025,1028,1029
al,1033,1037,1040,1041
al,922,1144,1148
al,857,1153,1156
al,1046,1049,1051,1054
al,1058,1061,1063,1066
al,1070,1073,1075,1078
al,907,1159,1163
al,872,1126,1130
al,882,1132,1133,1137
al,892,1139,1140
asel,s,loc,z,ibht+0.01
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
!asel,s,loc,z,elev1+0.015
!csys,1
!asel,r,loc,x,obir,obor
```

```
!csys,0
!vdrag,all,,,,,,4          ! Drag Lid to Lid Gap
!asel,s,loc,z,elev1+0.015
!asel,r,loc,z,elev1-0.015
!csys,1
!asel,r,loc,x,0,obir
!csys,0
!agen,2,all,,,,,ltlgh
!nummrg,kp
!asel,s,loc,z,elev2+0.015
!vdrag,all,,,,,,5          ! Drag Outer Barrier Upper Lid
!asel,s,loc,z,elev3
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,6          ! Drag Upper Skirt
/com, lines at bottom lid used to be here
!al,10,115,277,384
!al,12,13,68,379
!al,16,17,75,380
!al,20,21,85,381
!al,24,25,96,382
!al,28,29,107,383
!al,31,122,309,385
!al,32,116,281
!al,34,35,71,72
!al,38,39,78,79
!al,42,43,88,89
!al,46,47,99,100
!al,50,51,110,111
!al,53,121,305
!al,54,74,285
!al,56,57,82,83
!al,60,61,92,93
!al,64,65,103,104
!al,67,113,301
!al,114,117,289
!al,95,118,119,293
!al,106,120,297
!asel,s,loc,z,0
!vdrag,all,,,,,,7          ! Drag Inner Barrier Lower Lid
!csys,0
!asel,s,loc,z,-iblt
!vdrag,all,,,,,,8          ! Drag Outer Barrier Lower Lid
!asel,s,loc,z,elev5
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
!vsel,s,volu,,1,47
!type,1
!mat,1
!vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
```

```
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,0,elev1
csys,1
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
vsel,u,loc,x,ibir-0.02,obir
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,loc,x,obir,obor
vsel,r,loc,z,-iblt,elev1
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Upper Inner Barrier Adding Backfill Mass
vsel,inve
csys,1
vsel,u,loc,x,obir,obor
vsel,r,loc,z,0,elev1
vsel,u,volu,,1,92
csys,0
type,6
mat,6
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
!vsel,inve
!vsel,u,volu,,1,92
!csys,1
!vsel,u,loc,x,obir,obor
!vsel,a,loc,y,-90,5
!vsel,u,volu,,1,92
!vsel,u,type,,5
!type,6
!mat,6
!vmesh,all
/com, mesh upper outer barrier adding backfill mass
!vsel,inve
!vsel,u,type,,1,5
!type,7
!mat,7
!vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
nsel,s,loc,z,0
dsym,symm,z,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(7*bkht/bd),(10*bkht/bd)+0.02
nsel,r,loc,x,obir-0.001,obir+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini
```

```
 1031
 1032  /sol
 1033  expass,on
 1034  mxpand,8,,,yes
 1035  solve
 1036  fini
 1037
 1038  /sol
 1039  antype,spectr
 1040  spopt,sprs,,on
 1041  sed,,1
 1042  svtyp,2
 1043  freq,0.1,100
 1044  sv,,16.285,16.285
 1045  mcomb,srss,1e-8
 1046  outres,all,1
 1047  save
 1048  solve
 1049  fini
 1050  /exit
 1051  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ******************************************************************
   ANSYS STARTUP FILE  start.ans
   ******************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,
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 ABBREVIATION= R0        /pnum,real,0,

 ABBREVIATION= T1        /pnum,type,1,

 ABBREVIATION= T0        /pnum,type,0,

 ABBREVIATION= C1        /number,1,

 ABBREVIATION= C0        /number,0,

 ABBREVIATION= PR1       /psf,pres,norm,1,

 ABBREVIATION= PR0       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************
 ********************************************************************************
 ********************************************************************************
 *****  Seismic Analysis of 21 PWR Waste Package Under Degradation      *****
 *****  Degree of Degradation in Outer Barrier: 100%                    *****
 *****  Degree of Degradation in Inner Barrier:  90%                    *****
 *****  Degree of Degradation in Basket Assembly:  Tubes 100%           *****
 *****                                             Guides 50%           *****
 *****                                             SS-B Plates 0%       *****
 *****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
 *****  Quarter Symmetry Model                                          *****
 ********************************************************************************
 ********************************************************************************
 ********************************************************************************

 NUMBER OF DATA BASE PAGES IN MEMORY     (NVPAGE)=       512

 SI UNITS SPECIFIED FOR INTERNAL
  LENGTH         (L)  = METER(M)
  MASS           (M)  = KILOGRAM(KG)
  TIME           (t)  = SECOND(SEC)
  TEMPERATURE    (T)  = KELVIN(K)
  TOFFSET             = 0.0 KELVIN
  CHARGE         (Q)  = COULOMB
  CURRENT        (i)  = AMPERE (COULOMBS/SEC)
  FORCE          (f)  = NEWTON(N) (KG-M/SEC2)
  PRESSURE            = PASCAL (NEWTON/M**2)
  ENERGY         (W)  = JOULE (N-M)
```

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 POWER          (P)  = WATT (N-M/SEC)
 CAPACITANCE    (C)  = FARAD
 INDUCTANCE     (L)  = HENRY
 MAGNETIC FLUX       = WEBER
 RESISTANCE     (R)  = OHM
 ELECTRIC POTENTIAL = VOLT

 INPUT UNITS ARE ALSO SET TO SI
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   08:41:32  APR 11, 1996 CP=      0.360
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844



         ***** ANSYS ANALYSIS DEFINITION (PREP7) *****

 TITLE=
  21 PWR Tube Seismic Analysis With Backfill


 VIEW CONE ANGLE FOR WINDOW  1     0.00
  Define Parameters

 PARAMETER IBIR      =     0.7109500

 PARAMETER OBIR      =     0.7129500

 PARAMETER OBSR      =     0.7709500

 PARAMETER OBOR      =     0.7809500

 PARAMETER TS1       =     0.7000000E-02

 PARAMETER TS2       =     0.5000000E-02

 PARAMETER TS3       =     0.5000000E-02

 PARAMETER TS4       =     0.5000000E-02

 PARAMETER EGIH      =     0.8550000E-01

 PARAMETER PIE       =      3.141593

 PARAMETER ANG1      =     0.5235988

 PARAMETER ANG2      =      1.396263

 PARAMETER ANG3      =      1.012291

 PARAMETER TW        =     0.2285000

 PARAMETER POS1      =     0.1142500

 PARAMETER POS2      =     0.1192500

 PARAMETER POS3      =     0.1262500

 PARAMETER POS4      =     0.1312500

 PARAMETER POS5      =     0.3597500

 PARAMETER POS6      =     0.3647500

 PARAMETER POS7      =     0.3717500

 PARAMETER POS8      =     0.3767500
```

PARAMETER POS9 = 0.6052500

PARAMETER POS10 = 0.6102500

PARAMETER POS11 = 0.6152500

PARAMETER POSG = 0.3697500

PARAMETER POSEI = 0.7007500

PARAMETER POSEO = 0.6998684

PARAMETER POSEN = 0.1202500

PARAMETER POSEF = 0.1252500

PARAMETER POSEG = 0.3560897

PARAMETER POSCG = 0.6071257

PARAMETER BKHT = 2.287500

PARAMETER IBHT = 2.297500

PARAMETER IBLT = 0.7000000E-02

PARAMETER ELEV1 = 2.304500

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 2.334500

PARAMETER OBLT = 0.6000000E-01

PARAMETER ELEV3 = 2.394500

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 2.619500

PARAMETER ELEV5 = -0.6700000E-01

PARAMETER ELEV6 = -0.2920000
Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 2.000000

PARAMETER IBLD = 2.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 2.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

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PARAMETER A3D      =     4.000000

PARAMETER A4D      =     4.000000

PARAMETER A5D      =     4.000000

PARAMETER A6D      =     4.000000

PARAMETER A7D      =     4.000000

PARAMETER A8D      =     4.000000

PARAMETER A9D      =     4.000000

PARAMETER IBTD     =     2.000000

PARAMETER OBITD    =     2.000000

PARAMETER STD      =     2.000000
 Define Element Properties

ELEMENT TYPE    1 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    2 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    3 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    4 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    5 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE    6 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL
 ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
 Room Temperature Properties of Materials

MATERIAL    1          EX   =   0.2060000E+12

MATERIAL    2          EX   =   0.1950000E+12

MATERIAL    3          EX   =   0.2060000E+12

MATERIAL    4          EX   =   0.2060000E+12

MATERIAL    5          EX   =   0.2080000E+12
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MATERIAL    6        EX   =   0.2080000E+12
MATERIAL    1        NUXY =   0.3000000
MATERIAL    2        NUXY =   0.2980000
MATERIAL    3        NUXY =   0.3000000
MATERIAL    4        NUXY =   0.3000000
MATERIAL    5        NUXY =   0.2780000
MATERIAL    6        NUXY =   0.2780000
MATERIAL    1        DENS =    8131.000
MATERIAL    2        DENS =    7953.000
MATERIAL    3        DENS =    16262.00
MATERIAL    4        DENS =    16262.00
MATERIAL    5        DENS =    8442.000
MATERIAL    6        DENS =    1101960.
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1  X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2  X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3  X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4  X,Y,Z=  0.126250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5  X,Y,Z=  0.131250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6  X,Y,Z=  0.359750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7  X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8  X,Y,Z=  0.371750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9  X,Y,Z=  0.376750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10  X,Y,Z=  0.605250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11  X,Y,Z=  0.610250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12  X,Y,Z=  0.615250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13  X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14  X,Y,Z=  0.131250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15  X,Y,Z=  0.359750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16  X,Y,Z=  0.376750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17  X,Y,Z=  0.605250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18  X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19  X,Y,Z=  0.126250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20  X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
```

```
KEYPOINT     21   X,Y,Z=  0.371750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     22   X,Y,Z=  0.610250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     23   X,Y,Z=  0.615250      0.120250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     24   X,Y,Z=  0.710950       9.73722      0.000000E+00  IN CSYS=  1
                          0.700708      0.120243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     25   X,Y,Z=  0.126250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     26   X,Y,Z=  0.364750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     27   X,Y,Z=  0.371750      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     28   X,Y,Z=  0.610250      0.126250      0.000000E+00  IN CSYS=  0
KEYPOINT     29   X,Y,Z=  0.615250      0.125250      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     30   X,Y,Z=  0.710950       10.1464      0.000000E+00  IN CSYS=  1
                          0.699831      0.125243      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     31   X,Y,Z=  0.131250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     32   X,Y,Z=  0.359750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     33   X,Y,Z=  0.376750      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     34   X,Y,Z=  0.605250      0.131250      0.000000E+00  IN CSYS=  0
KEYPOINT     35   X,Y,Z=  0.359750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     36   X,Y,Z=  0.376750      0.359750      0.000000E+00  IN CSYS=  0
KEYPOINT     37   X,Y,Z=  0.605250      0.359750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     38   X,Y,Z=  0.710950       30.0611      0.000000E+00  IN CSYS=  1
                          0.615321      0.356131      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     39   X,Y,Z=  0.364750      0.364750      0.000000E+00  IN CSYS=  0
KEYPOINT     40   X,Y,Z=  0.371750      0.364750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     41   X,Y,Z=  0.710950       30.8670      0.000000E+00  IN CSYS=  1
                          0.610251      0.364751      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     42   X,Y,Z=  0.369750      0.369750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

KEYPOINT 43 X,Y,Z= 0.710950 31.3421 0.000000E+00 IN CSYS= 1
0.607206 0.369799 0.000000E+00 IN CSYS= 0
KEYPOINT 44 X,Y,Z= 0.710950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.710950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0
KEYPOINT 46 X,Y,Z= 0.712950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.712950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 47 X,Y,Z= 0.712950 9.73722 0.000000E+00 IN CSYS= 1
0.702679 0.120581 0.000000E+00 IN CSYS= 0
KEYPOINT 48 X,Y,Z= 0.712950 10.1464 0.000000E+00 IN CSYS= 1
0.701800 0.125596 0.000000E+00 IN CSYS= 0
KEYPOINT 49 X,Y,Z= 0.712950 30.0611 0.000000E+00 IN CSYS= 1
0.617052 0.357133 0.000000E+00 IN CSYS= 0
KEYPOINT 50 X,Y,Z= 0.712950 30.8670 0.000000E+00 IN CSYS= 1
0.611968 0.365777 0.000000E+00 IN CSYS= 0
KEYPOINT 51 X,Y,Z= 0.712950 31.3421 0.000000E+00 IN CSYS= 1
0.608914 0.370839 0.000000E+00 IN CSYS= 0
KEYPOINT 52 X,Y,Z= 0.712950 45.0000 0.000000E+00 IN CSYS= 1
0.504132 0.504132 0.000000E+00 IN CSYS= 0
KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 54 X,Y,Z= 0.770950 9.73722 0.000000E+00 IN CSYS= 1
0.759844 0.130391 0.000000E+00 IN CSYS= 0
KEYPOINT 55 X,Y,Z= 0.770950 10.1464 0.000000E+00 IN CSYS= 1
0.758893 0.135813 0.000000E+00 IN CSYS= 0
KEYPOINT 56 X,Y,Z= 0.770950 30.0611 0.000000E+00 IN CSYS= 1
0.667251 0.386186 0.000000E+00 IN CSYS= 0
KEYPOINT 57 X,Y,Z= 0.770950 30.8670 0.000000E+00 IN CSYS= 1
0.661753 0.395534 0.000000E+00 IN CSYS= 0
KEYPOINT 58 X,Y,Z= 0.770950 31.3421 0.000000E+00 IN CSYS= 1
0.658450 0.401008 0.000000E+00 IN CSYS= 0
KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0
KEYPOINT 60 X,Y,Z= 0.780950 0.000000E+00 0.000000E+00 IN CSYS= 1

```
                    0.780950      0.000000E+00  0.000000E+00  IN CSYS=  0

KEYPOINT     61   X,Y,Z=  0.780950       9.73722       0.000000E+00  IN CSYS=  1

                    0.769699      0.732082      0.000000E+00  IN CSYS=  0

KEYPOINT     62   X,Y,Z=  0.780950       10.1464       0.000000E+00  IN CSYS=  1

                    0.768737      0.737575      0.000000E+00  IN CSYS=  0

KEYPOINT     63   X,Y,Z=  0.780950       30.0611       0.000000E+00  IN CSYS=  1

                    0.675906      0.691196      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.780950       30.8670       0.000000E+00  IN CSYS=  1

                    0.670337      0.700664      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.780950       31.3421       0.000000E+00  IN CSYS=  1

                    0.666991      0.706209      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.780950       45.0000       0.000000E+00  IN CSYS=  1

                    0.552215      0.552215      0.000000E+00  IN CSYS=  0

COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
  XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
  ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
  ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT     13 USED FOR KEYPOINT(S)      79
KEYPOINT     18 USED FOR KEYPOINT(S)      84
KEYPOINT     25 USED FOR KEYPOINT(S)      91
KEYPOINT     31 USED FOR KEYPOINT(S)      97
KEYPOINT     35 USED FOR KEYPOINT(S)     101
KEYPOINT     39 USED FOR KEYPOINT(S)     105
KEYPOINT     42 USED FOR KEYPOINT(S)     108
KEYPOINT     45 USED FOR KEYPOINT(S)     111
KEYPOINT     52 USED FOR KEYPOINT(S)     118
KEYPOINT     59 USED FOR KEYPOINT(S)     125
KEYPOINT     66 USED FOR KEYPOINT(S)     132

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT      2 USED FOR KEYPOINT(S)      79
KEYPOINT      3 USED FOR KEYPOINT(S)      84
KEYPOINT      4 USED FOR KEYPOINT(S)      91
KEYPOINT      5 USED FOR KEYPOINT(S)      97
KEYPOINT      6 USED FOR KEYPOINT(S)     101
KEYPOINT      7 USED FOR KEYPOINT(S)     105
KEYPOINT      8 USED FOR KEYPOINT(S)     108
KEYPOINT      9 USED FOR KEYPOINT(S)     111
KEYPOINT     10 USED FOR KEYPOINT(S)     118
KEYPOINT     11 USED FOR KEYPOINT(S)     125
KEYPOINT     12 USED FOR KEYPOINT(S)     132
KEYPOINT     44 USED FOR KEYPOINT(S)     164
KEYPOINT     46 USED FOR KEYPOINT(S)     166
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 KEYPOINT     53 USED FOR KEYPOINT(S)     173
 KEYPOINT     60 USED FOR KEYPOINT(S)     180

 DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

 KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   2.28750      IN CSYS=  0

 LINE CONNECTS KEYPOINTS       1  1001
  LINE NO.=     1  KP1=       1  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    1001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =   15,  SPACING RATIO =   0.200

 KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   2.29750      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    1001  2001
  LINE NO.=     2  KP1=    1001  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    2001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    2,  SPACING RATIO =   1.000

 KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   2.30450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    2001  3001
  LINE NO.=     3  KP1=    2001  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    3001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    2,  SPACING RATIO =   1.000

 KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   2.33450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    3001  4001
  LINE NO.=     4  KP1=    3001  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    4001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    2,  SPACING RATIO =   1.000

 KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   2.39450      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    4001  5001
  LINE NO.=     5  KP1=    4001  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    5001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    1,  SPACING RATIO =   1.000

 KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   2.61950      IN CSYS=  0

 LINE CONNECTS KEYPOINTS    5001  6001
  LINE NO.=     6  KP1=    5001  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    6001  TAN2=    0.0000   0.0000   1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    1,  SPACING RATIO =   1.000

 KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.700000E-02  IN CSYS=  0

 LINE CONNECTS KEYPOINTS       1  7001
  LINE NO.=     7  KP1=       1  TAN1=    0.0000   0.0000   1.0000
                   KP2=    7001  TAN2=    0.0000   0.0000  -1.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    2,  SPACING RATIO =   1.000

 KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.670000E-01  IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.292000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
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 LINE NO.=    23  KP1=     70  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     85  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     80  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     72    81
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     81  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=    26  KP1=     73  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     86  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=    27  KP1=     74  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     87  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=    28  KP1=     75  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     82  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=    29  KP1=     76  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     83  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=    30  KP1=     77  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     88  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=    31  KP1=     78  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     89  TAN2=    1.0000    0.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 Line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=    32  KP1=    211  TAN1=   -1.0000    0.0003    0.0000
                  KP2=    218  TAN2=    1.0000   -0.0003    0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=    33  KP1=    210  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    220  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=    34  KP1=    215  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    217  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=    35  KP1=    214  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    216  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=    36  KP1=    209  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    219  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=    37  KP1=    208  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    159  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=    38  KP1=    213  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    155  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=    39  KP1=    151  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    152  TAN2=    1.0000    0.0000    0.0000
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 LINE CONNECTS KEYPOINTS    145   146
  LINE NO.=    40  KP1=     145  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     146  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    139   140
  LINE NO.=    41  KP1=     139  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     140  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    134   135
  LINE NO.=    42  KP1=     134  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     135  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     14    15
  LINE NO.=    43  KP1=      14  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      15  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     19    20
  LINE NO.=    44  KP1=      19  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      20  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     25    26
  LINE NO.=    45  KP1=      25  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      26  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     31    32
  LINE NO.=    46  KP1=      31  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      32  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     98    35
  LINE NO.=    47  KP1=      98  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      35  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     92    39
  LINE NO.=    48  KP1=      92  TAN1=   -1.0000   0.0000   0.0000
                   KP2=      39  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     93   106
  LINE NO.=    49  KP1=      93  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     106  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     99   102
  LINE NO.=    50  KP1=      99  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     102  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    100   103
  LINE NO.=    51  KP1=     100  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     103  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     94   107
  LINE NO.=    52  KP1=      94  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     107  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS     95   104
  LINE NO.=    53  KP1=      95  TAN1=   -1.0000  -0.0003   0.0000
                   KP2=     104  TAN2=    1.0000   0.0003   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000
  line set 3 Tube Widths on End Column

 LINE CONNECTS KEYPOINTS    162   163
  LINE NO.=    54  KP1=     162  TAN1=   -1.0000   0.0002   0.0000
                   KP2=     163  TAN2=    1.0000  -0.0002   0.0000

 LINE CONNECTS KEYPOINTS    160   161
  LINE NO.=    55  KP1=     160  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     161  TAN2=    1.0000   0.0000   0.0000

 LINE CONNECTS KEYPOINTS    156   157
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 LINE NO.=    56  KP1=    156  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    157  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    153   154
 LINE NO.=    57  KP1=    153  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    154  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    147   148
 LINE NO.=    58  KP1=    147  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    148  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    142  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    137  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     17  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     22  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     28  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     34  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     37  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     41  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -1.0000  -0.0002   0.0000
                  KP2=     43  TAN2=    1.0000   0.0002   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    200  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    204  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    209  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    214  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    216  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=     220  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     219  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=     221  TAN1=     0.0002  -1.0000   0.0000
                  KP2=     162  TAN2=    -0.0002   1.0000   0.0000

LINE CONNECTS KEYPOINTS    199   198
 LINE NO.=    75  KP1=     199  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     198  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=    76  KP1=     203  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     202  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=    77  KP1=     208  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     145  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=    78  KP1=     213  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     151  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=    79  KP1=     155  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     152  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=    80  KP1=     159  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     146  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=    81  KP1=     160  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     147  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=    82  KP1=     156  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     153  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=    83  KP1=     157  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     154  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=    84  KP1=     161  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     148  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=    85  KP1=     133  TAN1=     0.0000  -1.0000   0.0000
                  KP2=      13  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=    86  KP1=     138  TAN1=     0.0000  -1.0000   0.0000
                  KP2=      18  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=    87  KP1=     139  TAN1=     0.0000  -1.0000   0.0000
                  KP2=      19  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=    88  KP1=     134  TAN1=     0.0000  -1.0000   0.0000
                  KP2=      14  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=    89  KP1=     135  TAN1=     0.0000  -1.0000   0.0000
                  KP2=      15  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
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 LINE NO.=    90  KP1=    140  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     20  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    141    21
 LINE NO.=    91  KP1=    141  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     21  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    136    16
 LINE NO.=    92  KP1=    136  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     16  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=    93  KP1=    137  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     17  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=    94  KP1=    142  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     22  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=    95  KP1=    143  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     23  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=    96  KP1=     80  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     81  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=    97  KP1=     85  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     86  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=    98  KP1=     25  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     92  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=    99  KP1=     31  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     98  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=   100  KP1=     32  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     35  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=   101  KP1=     26  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     39  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=   102  KP1=     27  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     40  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=   103  KP1=     33  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     36  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=   104  KP1=     34  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     37  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=   105  KP1=     28  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     41  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=   106  KP1=     29  TAN1=   -0.0003  -1.0000   0.0000
                  KP2=     38  TAN2=    0.0003   1.0000   0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=   107  KP1=     82  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     83  TAN2=    0.0000   1.0000   0.0000
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 LINE CONNECTS KEYPOINTS     87    88
  LINE NO.=   108  KP1=      87  TAN1=    0.0000  -1.0000   0.0000
                   KP2=      88  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     93    94
  LINE NO.=   109  KP1=      93  TAN1=    0.0000  -1.0000   0.0000
                   KP2=      94  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     99   100
  LINE NO.=   110  KP1=      99  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     100  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    102   103
  LINE NO.=   111  KP1=     102  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     103  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    106   107
  LINE NO.=   112  KP1=     106  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     107  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS     42   109
  LINE NO.=   113  KP1=      42  TAN1=   -0.0002  -1.0000   0.0000
                   KP2=     109  TAN2=    0.0002   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    158   149
  LINE NO.=   114  KP1=     158  TAN1=    0.0003  -1.0000   0.0000
                   KP2=     149  TAN2=   -0.0003   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 5 End Guide Fins

 LINE CONNECTS KEYPOINTS    207   206
  LINE NO.=   115  KP1=     207  TAN1=   -0.0001  -1.0000   0.0000
                   KP2=     206  TAN2=    0.0001   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    212   211
  LINE NO.=   116  KP1=     212  TAN1=   -0.0001  -1.0000   0.0000
                   KP2=     211  TAN2=    0.0001   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    150   149
  LINE NO.=   117  KP1=     150  TAN1=    1.0000   0.0001   0.0000
                   KP2=     149  TAN2=   -1.0000  -0.0001   0.0000

 LINE CONNECTS KEYPOINTS    144   143
  LINE NO.=   118  KP1=     144  TAN1=    1.0000   0.0001   0.0000
                   KP2=     143  TAN2=   -1.0000  -0.0001   0.0000

 LINE CONNECTS KEYPOINTS     24    23
  LINE NO.=   119  KP1=      24  TAN1=    1.0000  -0.0001   0.0000
                   KP2=      23  TAN2=   -1.0000   0.0001   0.0000

 LINE CONNECTS KEYPOINTS     30    29
  LINE NO.=   120  KP1=      30  TAN1=    1.0000  -0.0001   0.0000
                   KP2=      29  TAN2=   -1.0000   0.0001   0.0000

 LINE CONNECTS KEYPOINTS     96    95
  LINE NO.=   121  KP1=      96  TAN1=   -0.0001   1.0000   0.0000
                   KP2=      95  TAN2=    0.0001  -1.0000   0.0000

 LINE CONNECTS KEYPOINTS     90    89
  LINE NO.=   122  KP1=      90  TAN1=   -0.0001   1.0000   0.0000
                   KP2=      89  TAN2=    0.0001  -1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 6 SS-B Plate Thickness

 LINE CONNECTS KEYPOINTS    197   196
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 LINE NO.=   123  KP1=    197  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    196  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    206   205
 LINE NO.=   124  KP1=    206  TAN1=    0.1961   -0.9806    0.0000
                  KP2=    205  TAN2=   -0.1961    0.9806    0.0000

LINE CONNECTS KEYPOINTS    211   210
 LINE NO.=   125  KP1=    211  TAN1=   -0.1961   -0.9806    0.0000
                  KP2=    210  TAN2=    0.1961    0.9806    0.0000

LINE CONNECTS KEYPOINTS    207   212
 LINE NO.=   126  KP1=    207  TAN1=   -0.9850   -0.1726    0.0000
                  KP2=    212  TAN2=    0.9850    0.1726    0.0000

LINE CONNECTS KEYPOINTS    206   211
 LINE NO.=   127  KP1=    206  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    211  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    205   210
 LINE NO.=   128  KP1=    205  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    210  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    218   220
 LINE NO.=   129  KP1=    218  TAN1=   -0.8619   -0.5070    0.0000
                  KP2=    220  TAN2=    0.8619    0.5070    0.0000

LINE CONNECTS KEYPOINTS    220   221
 LINE NO.=   130  KP1=    220  TAN1=   -0.8562   -0.5166    0.0000
                  KP2=    221  TAN2=    0.8562    0.5166    0.0000

LINE CONNECTS KEYPOINTS    193   192
 LINE NO.=   131  KP1=    193  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    192  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    204   203
 LINE NO.=   132  KP1=    204  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    203  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    209   208
 LINE NO.=   133  KP1=    209  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    208  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    204   209
 LINE NO.=   134  KP1=    204  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    209  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    203   208
 LINE NO.=   135  KP1=    203  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    208  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    219   159
 LINE NO.=   136  KP1=    219  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    159  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    162   160
 LINE NO.=   137  KP1=    162  TAN1=   -0.3714   -0.9285    0.0000
                  KP2=    160  TAN2=    0.3714    0.9285    0.0000

LINE CONNECTS KEYPOINTS    163   161
 LINE NO.=   138  KP1=    163  TAN1=   -0.5166   -0.8562    0.0000
                  KP2=    161  TAN2=    0.5166    0.8562    0.0000

LINE CONNECTS KEYPOINTS    161   158
 LINE NO.=   139  KP1=    161  TAN1=   -0.5070   -0.8619    0.0000
                  KP2=    158  TAN2=    0.5070    0.8619    0.0000

LINE CONNECTS KEYPOINTS    219   162
 LINE NO.=   140  KP1=    219  TAN1=   -0.9285   -0.3714    0.0000
                  KP2=    162  TAN2=    0.9285    0.3714    0.0000
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LINE CONNECTS KEYPOINTS    159   160
 LINE NO.=   141  KP1=     159  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     160  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    189   188
 LINE NO.=   142  KP1=     189  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     188  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   138
 LINE NO.=   143  KP1=     202  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     138  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=     145  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     139  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=     202  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     145  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=     138  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     139  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=     146  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     140  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=     147  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     141  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=     146  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     147  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=     140  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     141  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=     148  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     142  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=     149  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     143  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=     148  TAN1=   -0.9806   -0.1961    0.0000
                  KP2=     149  TAN2=    0.9806    0.1961    0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=     142  TAN1=   -0.9806    0.1961    0.0000
                  KP2=     143  TAN2=    0.9806   -0.1961    0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=     150  TAN1=   -0.1726   -0.9850    0.0000
                  KP2=     144  TAN2=    0.1726    0.9850    0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=      69  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      70  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=      18  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      85  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     19    25
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 LINE NO.=   158  KP1=     19  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     25  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     18     19
 LINE NO.=   159  KP1=     18  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     19  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     85     25
 LINE NO.=   160  KP1=     85  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     25  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     20     26
 LINE NO.=   161  KP1=     20  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     26  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     21     27
 LINE NO.=   162  KP1=     21  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     27  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     20     21
 LINE NO.=   163  KP1=     20  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     21  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     26     27
 LINE NO.=   164  KP1=     26  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     27  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     22     28
 LINE NO.=   165  KP1=     22  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     28  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     22     23
 LINE NO.=   166  KP1=     22  TAN1=   -0.9806   -0.1961    0.0000
                  KP2=     23  TAN2=    0.9806    0.1961    0.0000

 LINE CONNECTS KEYPOINTS     28     29
 LINE NO.=   167  KP1=     28  TAN1=   -0.9806    0.1961    0.0000
                  KP2=     29  TAN2=    0.9806   -0.1961    0.0000

 LINE CONNECTS KEYPOINTS     23     29
 LINE NO.=   168  KP1=     23  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     29  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     24     30
 LINE NO.=   169  KP1=     24  TAN1=    0.1726   -0.9850    0.0000
                  KP2=     30  TAN2=   -0.1726    0.9850    0.0000

 LINE CONNECTS KEYPOINTS     73     74
 LINE NO.=   170  KP1=     73  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     74  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     86     87
 LINE NO.=   171  KP1=     86  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     87  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     92     93
 LINE NO.=   172  KP1=     92  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     93  TAN2=    0.0000    1.0000    0.0000

 LINE CONNECTS KEYPOINTS     86     92
 LINE NO.=   173  KP1=     86  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     92  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     87     93
 LINE NO.=   174  KP1=     87  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     93  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     39    106
 LINE NO.=   175  KP1=     39  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    106  TAN2=    0.0000    1.0000    0.0000
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LINE CONNECTS KEYPOINTS     40    42
 LINE NO.=   176  KP1=      40  TAN1=    0.3714   -0.9285    0.0000
                  KP2=      42  TAN2=   -0.3714    0.9285    0.0000

LINE CONNECTS KEYPOINTS     39    40
 LINE NO.=   177  KP1=      39  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      40  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=   178  KP1=     106  TAN1=   -0.9285    0.3714    0.0000
                  KP2=      42  TAN2=    0.9285   -0.3714    0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=   179  KP1=      38  TAN1=    0.5070   -0.8619    0.0000
                  KP2=      41  TAN2=   -0.5070    0.8619    0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=   180  KP1=      41  TAN1=    0.5166   -0.8562    0.0000
                  KP2=      43  TAN2=   -0.5166    0.8562    0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=   181  KP1=      77  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      78  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=   182  KP1=      88  TAN1=   -0.1961   -0.9806    0.0000
                  KP2=      89  TAN2=    0.1961    0.9806    0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=   183  KP1=      94  TAN1=    0.1961   -0.9806    0.0000
                  KP2=      95  TAN2=   -0.1961    0.9806    0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=   184  KP1=      88  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      94  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=   185  KP1=      89  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      95  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=   186  KP1=      90  TAN1=   -0.9850    0.1726    0.0000
                  KP2=      96  TAN2=    0.9850   -0.1726    0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=   187  KP1=     109  TAN1=    0.8562   -0.5166    0.0000
                  KP2=     107  TAN2=   -0.8562    0.5166    0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=   188  KP1=     107  TAN1=    0.8619   -0.5070    0.0000
                  KP2=     104  TAN2=   -0.8619    0.5070    0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=   189  KP1=     224  TAN1=   -0.9850   -0.1726    0.0000
                  KP2=     225  TAN2=    0.9850    0.1726    0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=   190  KP1=     230  TAN1=   -0.9850   -0.1726    0.0000
                  KP2=     231  TAN2=    0.9850    0.1726    0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=   191  KP1=     236  TAN1=   -0.9850   -0.1726    0.0000
                  KP2=     237  TAN2=    0.9850    0.1726    0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=   192  KP1=     226  TAN1=   -0.8619   -0.5070    0.0000
                  KP2=     227  TAN2=    0.8619    0.5070    0.0000

LINE CONNECTS KEYPOINTS    227   228
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 LINE NO.=   193  KP1=    227  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    228  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    232   233
 LINE NO.=   194  KP1=    232  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=    233  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    233   234
 LINE NO.=   195  KP1=    233  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    234  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    238   239
 LINE NO.=   196  KP1=    238  TAN1=   -0.8619  -0.5070   0.0000
                  KP2=    239  TAN2=    0.8619   0.5070   0.0000

LINE CONNECTS KEYPOINTS    239   240
 LINE NO.=   197  KP1=    239  TAN1=   -0.8562  -0.5166   0.0000
                  KP2=    240  TAN2=    0.8562   0.5166   0.0000

LINE CONNECTS KEYPOINTS    171   170
 LINE NO.=   198  KP1=    171  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    170  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    170   169
 LINE NO.=   199  KP1=    170  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    169  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    178   177
 LINE NO.=   200  KP1=    178  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    177  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    177   176
 LINE NO.=   201  KP1=    177  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    176  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    185   184
 LINE NO.=   202  KP1=    185  TAN1=   -0.5166  -0.8562   0.0000
                  KP2=    184  TAN2=    0.5166   0.8562   0.0000

LINE CONNECTS KEYPOINTS    184   183
 LINE NO.=   203  KP1=    184  TAN1=   -0.5070  -0.8619   0.0000
                  KP2=    183  TAN2=    0.5070   0.8619   0.0000

LINE CONNECTS KEYPOINTS    168   167
 LINE NO.=   204  KP1=    168  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    167  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS    175   174
 LINE NO.=   205  KP1=    175  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    174  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS    182   181
 LINE NO.=   206  KP1=    182  TAN1=   -0.1726  -0.9850   0.0000
                  KP2=    181  TAN2=    0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     47    48
 LINE NO.=   207  KP1=     47  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     48  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     54    55
 LINE NO.=   208  KP1=     54  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     55  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     61    62
 LINE NO.=   209  KP1=     61  TAN1=    0.1726  -0.9850   0.0000
                  KP2=     62  TAN2=   -0.1726   0.9850   0.0000

LINE CONNECTS KEYPOINTS     49    50
 LINE NO.=   210  KP1=     49  TAN1=    0.5070  -0.8619   0.0000
                  KP2=     50  TAN2=   -0.5070   0.8619   0.0000
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 LINE CONNECTS KEYPOINTS     50    51
  LINE NO.=    211  KP1=     50  TAN1=    0.5166  -0.8562   0.0000
                    KP2=     51  TAN2=   -0.5166   0.8562   0.0000

 LINE CONNECTS KEYPOINTS     56    57
  LINE NO.=    212  KP1=     56  TAN1=    0.5070  -0.8619   0.0000
                    KP2=     57  TAN2=   -0.5070   0.8619   0.0000

 LINE CONNECTS KEYPOINTS     57    58
  LINE NO.=    213  KP1=     57  TAN1=    0.5166  -0.8562   0.0000
                    KP2=     58  TAN2=   -0.5166   0.8562   0.0000

 LINE CONNECTS KEYPOINTS     63    64
  LINE NO.=    214  KP1=     63  TAN1=    0.5070  -0.8619   0.0000
                    KP2=     64  TAN2=   -0.5070   0.8619   0.0000

 LINE CONNECTS KEYPOINTS     64    65
  LINE NO.=    215  KP1=     64  TAN1=    0.5166  -0.8562   0.0000
                    KP2=     65  TAN2=   -0.5166   0.8562   0.0000

 LINE CONNECTS KEYPOINTS    117   116
  LINE NO.=    216  KP1=    117  TAN1=    0.8562  -0.5166   0.0000
                    KP2=    116  TAN2=   -0.8562   0.5166   0.0000

 LINE CONNECTS KEYPOINTS    116   115
  LINE NO.=    217  KP1=    116  TAN1=    0.8619  -0.5070   0.0000
                    KP2=    115  TAN2=   -0.8619   0.5070   0.0000

 LINE CONNECTS KEYPOINTS    124   123
  LINE NO.=    218  KP1=    124  TAN1=    0.8562  -0.5166   0.0000
                    KP2=    123  TAN2=   -0.8562   0.5166   0.0000

 LINE CONNECTS KEYPOINTS    123   122
  LINE NO.=    219  KP1=    123  TAN1=    0.8619  -0.5070   0.0000
                    KP2=    122  TAN2=   -0.8619   0.5070   0.0000

 LINE CONNECTS KEYPOINTS    131   130
  LINE NO.=    220  KP1=    131  TAN1=    0.8562  -0.5166   0.0000
                    KP2=    130  TAN2=   -0.8562   0.5166   0.0000

 LINE CONNECTS KEYPOINTS    130   129
  LINE NO.=    221  KP1=    130  TAN1=    0.8619  -0.5070   0.0000
                    KP2=    129  TAN2=   -0.8619   0.5070   0.0000

 LINE CONNECTS KEYPOINTS    114   113
  LINE NO.=    222  KP1=    114  TAN1=    0.9850  -0.1726   0.0000
                    KP2=    113  TAN2=   -0.9850   0.1726   0.0000

 LINE CONNECTS KEYPOINTS    121   120
  LINE NO.=    223  KP1=    121  TAN1=    0.9850  -0.1726   0.0000
                    KP2=    120  TAN2=   -0.9850   0.1726   0.0000

 LINE CONNECTS KEYPOINTS    128   127
  LINE NO.=    224  KP1=    128  TAN1=    0.9850  -0.1726   0.0000
                    KP2=    127  TAN2=   -0.9850   0.1726   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     2,  SPACING RATIO =    1.000
  line set 7 tube thickness

 LINE CONNECTS KEYPOINTS    196   195
  LINE NO.=    225  KP1=    196  TAN1=    0.0000  -1.0000   0.0000
                    KP2=    195  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    205   201
  LINE NO.=    226  KP1=    205  TAN1=    0.7071  -0.7071   0.0000
                    KP2=    201  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS    204   200
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LINE NO.=	227	KP1=	204	TAN1=	0.7071	0.7071	0.0000
		KP2=	200	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			193	194			
LINE NO.=	228	KP1=	193	TAN1=	0.0000	1.0000	0.0000
		KP2=	194	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			210	215			
LINE NO.=	229	KP1=	210	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	215	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			220	217			
LINE NO.=	230	KP1=	220	TAN1=	0.7071	-0.7071	0.0000
		KP2=	217	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			219	216			
LINE NO.=	231	KP1=	219	TAN1=	0.7071	0.7071	0.0000
		KP2=	216	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			209	214			
LINE NO.=	232	KP1=	209	TAN1=	-0.7071	0.7071	0.0000
		KP2=	214	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			192	191			
LINE NO.=	233	KP1=	192	TAN1=	0.0000	-1.0000	0.0000
		KP2=	191	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			203	199			
LINE NO.=	234	KP1=	203	TAN1=	0.7071	-0.7071	0.0000
		KP2=	199	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			202	198			
LINE NO.=	235	KP1=	202	TAN1=	0.7071	0.7071	0.0000
		KP2=	198	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			189	190			
LINE NO.=	236	KP1=	189	TAN1=	0.0000	1.0000	0.0000
		KP2=	190	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS			208	213			
LINE NO.=	237	KP1=	208	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	213	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			159	155			
LINE NO.=	238	KP1=	159	TAN1=	0.7071	-0.7071	0.0000
		KP2=	155	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			146	152			
LINE NO.=	239	KP1=	146	TAN1=	0.7071	0.7071	0.0000
		KP2=	152	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			145	151			
LINE NO.=	240	KP1=	145	TAN1=	-0.7071	0.7071	0.0000
		KP2=	151	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			160	156			
LINE NO.=	241	KP1=	160	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	156	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			161	157			
LINE NO.=	242	KP1=	161	TAN1=	0.7071	-0.7071	0.0000
		KP2=	157	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS			148	154			
LINE NO.=	243	KP1=	148	TAN1=	0.7071	0.7071	0.0000
		KP2=	154	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS			147	153			
LINE NO.=	244	KP1=	147	TAN1=	-0.7071	0.7071	0.0000
		KP2=	153	TAN2=	0.7071	-0.7071	0.0000

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LINE CONNECTS KEYPOINTS    188   187
 LINE NO.=   245  KP1=     188  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     187  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138   133
 LINE NO.=   246  KP1=     138  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     133  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     18    13
 LINE NO.=   247  KP1=      18  TAN1=    0.7071   0.7071   0.0000
                  KP2=      13  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     69    68
 LINE NO.=   248  KP1=      69  TAN1=    0.0000   1.0000   0.0000
                  KP2=      68  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    139   134
 LINE NO.=   249  KP1=     139  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     134  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    140   135
 LINE NO.=   250  KP1=     140  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     135  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     20    15
 LINE NO.=   251  KP1=      20  TAN1=    0.7071   0.7071   0.0000
                  KP2=      15  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     19    14
 LINE NO.=   252  KP1=      19  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      14  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    141   136
 LINE NO.=   253  KP1=     141  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     136  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    142   137
 LINE NO.=   254  KP1=     142  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     137  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     22    17
 LINE NO.=   255  KP1=      22  TAN1=    0.7071   0.7071   0.0000
                  KP2=      17  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     21    16
 LINE NO.=   256  KP1=      21  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      16  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     70    71
 LINE NO.=   257  KP1=      70  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      71  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    80
 LINE NO.=   258  KP1=      85  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      80  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     86    81
 LINE NO.=   259  KP1=      86  TAN1=    0.7071   0.7071   0.0000
                  KP2=      81  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     73    72
 LINE NO.=   260  KP1=      73  TAN1=    0.0000   1.0000   0.0000
                  KP2=      72  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    31
 LINE NO.=   261  KP1=      25  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      31  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     26    32
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 LINE NO.=   262  KP1=     26  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     32  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     39    35
 LINE NO.=   263  KP1=     39  TAN1=    0.7071   0.7071   0.0000
                  KP2=     35  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     92    98
 LINE NO.=   264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     98  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=     27  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     33  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=     28  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     34  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=     41  TAN1=    0.7071   0.7071   0.0000
                  KP2=     37  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=     40  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     36  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=     74  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     75  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=     87  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     82  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=     88  TAN1=    0.7071   0.7071   0.0000
                  KP2=     83  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=     77  TAN1=    0.0000   1.0000   0.0000
                  KP2=     76  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=     93  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     99  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=    106  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    102  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=    107  TAN1=    0.7071   0.7071   0.0000
                  KP2=    103  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=     94  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    100  TAN2=    0.7071  -0.7071   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=    222  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    207  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    223   224
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 LINE NO.=   278  KP1=    223  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    224  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279  KP1=    229  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    230  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS    235   236
 LINE NO.=   280  KP1=    235  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    236  TAN2=    0.9856   0.1691   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281  KP1=    212  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    218  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282  KP1=    225  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    226  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283  KP1=    231  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    232  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284  KP1=    237  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=    238  TAN2=    0.8655   0.5009   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285  KP1=    221  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    163  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286  KP1=    228  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    171  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287  KP1=    234  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    178  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288  KP1=    240  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    185  TAN2=    0.5201   0.8541   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289  KP1=    158  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    150  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290  KP1=    169  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    168  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291  KP1=    176  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    175  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292  KP1=    183  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    182  TAN2=    0.1762   0.9844   0.0000
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SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     24  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    167    47
 LINE NO.=   294  KP1=    167  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     47  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=    174  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     54  TAN2=   -0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=    181  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=     61  TAN2=   -0.1691   0.9856   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=     30  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     38  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=     48  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     49  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=     55  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     56  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=     62  TAN1=    0.1762  -0.9844   0.0000
                  KP2=     63  TAN2=   -0.5009   0.8655   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=     43  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    109  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=     51  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    117  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=     58  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    124  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=     65  TAN1=    0.5201  -0.8541   0.0000
                  KP2=    131  TAN2=   -0.8541   0.5201   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=    104  TAN1=    0.8655  -0.5009   0.0000
                  KP2=     96  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    115   114
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 LINE NO.=   306  KP1=    115  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    114  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307  KP1=    122  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    121  TAN2=   -0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS    129   128
 LINE NO.=   308  KP1=    129  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    128  TAN2=   -0.9844   0.1762   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=     90  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=    113  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=    120  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=    127  TAN1=    0.9856  -0.1691   0.0000
                  KP2=    126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=    222  TAN1=    0.0000   1.0000   0.0000
                  KP2=    223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=    207  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    224  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=    212  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    225  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=    218  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    226  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=    220  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    227  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=    221  TAN1=   -0.5201   0.8541   0.0000
                  KP2=    228  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=    163  TAN1=   -0.8541   0.5201   0.0000
                  KP2=    171  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=    161  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    170  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    158   169
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 LINE NO.=   321  KP1=    158  TAN1=   -0.8655   0.5009   0.0000
                  KP2=    169  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=    150  TAN1=   -0.9844   0.1762   0.0000
                  KP2=    168  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    144   167
 LINE NO.=   323  KP1=    144  TAN1=   -0.9856   0.1691   0.0000
                  KP2=    167  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=     24  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=     47  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=     30  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=     48  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=     38  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     49  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=     41  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     50  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=     43  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=     51  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=    109  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=    117  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=    107  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=    116  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=    104  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=    115  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=     96  TAN1=   -0.1762  -0.9844   0.0000
                  KP2=    114  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=     90  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=    113  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=    110  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    112  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=    223  TAN1=    0.0000   1.0000   0.0000
                  KP2=    229  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=    224  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    230  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=    225  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    231  TAN2=    0.1762  -0.9844   0.0000
```

```
LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=    338  KP1=    226  TAN1=   -0.5009   0.8655   0.0000
                   KP2=    232  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=    339  KP1=    227  TAN1=   -0.5130   0.8584   0.0000
                   KP2=    233  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    228   234
 LINE NO.=    340  KP1=    228  TAN1=   -0.5201   0.8541   0.0000
                   KP2=    234  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    171   178
 LINE NO.=    341  KP1=    171  TAN1=   -0.8541   0.5201   0.0000
                   KP2=    178  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    170   177
 LINE NO.=    342  KP1=    170  TAN1=   -0.8584   0.5130   0.0000
                   KP2=    177  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    169   176
 LINE NO.=    343  KP1=    169  TAN1=   -0.8655   0.5009   0.0000
                   KP2=    176  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    168   175
 LINE NO.=    344  KP1=    168  TAN1=   -0.9844   0.1762   0.0000
                   KP2=    175  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    167   174
 LINE NO.=    345  KP1=    167  TAN1=   -0.9856   0.1691   0.0000
                   KP2=    174  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     47    54
 LINE NO.=    346  KP1=     47  TAN1=   -0.9856  -0.1691   0.0000
                   KP2=     54  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     48    55
 LINE NO.=    347  KP1=     48  TAN1=   -0.9844  -0.1762   0.0000
                   KP2=     55  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     49    56
 LINE NO.=    348  KP1=     49  TAN1=   -0.8655  -0.5009   0.0000
                   KP2=     56  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     50    57
 LINE NO.=    349  KP1=     50  TAN1=   -0.8584  -0.5130   0.0000
                   KP2=     57  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     51    58
 LINE NO.=    350  KP1=     51  TAN1=   -0.8541  -0.5201   0.0000
                   KP2=     58  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    117   124
 LINE NO.=    351  KP1=    117  TAN1=   -0.5201  -0.8541   0.0000
                   KP2=    124  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    116   123
 LINE NO.=    352  KP1=    116  TAN1=   -0.5130  -0.8584   0.0000
                   KP2=    123  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    115   122
 LINE NO.=    353  KP1=    115  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=    122  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    114   121
 LINE NO.=    354  KP1=    114  TAN1=   -0.1762  -0.9844   0.0000
                   KP2=    121  TAN2=    0.1762   0.9844   0.0000

LINE CONNECTS KEYPOINTS    113   120
```

```
 LINE NO.=   355  KP1=    113  TAN1=   -0.1691  -0.9856   0.0000
                  KP2=    120  TAN2=    0.1691   0.9856   0.0000

LINE CONNECTS KEYPOINTS    112   119
 LINE NO.=   356  KP1=    112  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    119  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000
 line set 19 skirt thickness

LINE CONNECTS KEYPOINTS    229   235
 LINE NO.=   357  KP1=    229  TAN1=    0.0000   1.0000   0.0000
                  KP2=    235  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    230   236
 LINE NO.=   358  KP1=    230  TAN1=   -0.1691   0.9856   0.0000
                  KP2=    236  TAN2=    0.1691  -0.9856   0.0000

LINE CONNECTS KEYPOINTS    231   237
 LINE NO.=   359  KP1=    231  TAN1=   -0.1762   0.9844   0.0000
                  KP2=    237  TAN2=    0.1762  -0.9844   0.0000

LINE CONNECTS KEYPOINTS    232   238
 LINE NO.=   360  KP1=    232  TAN1=   -0.5009   0.8655   0.0000
                  KP2=    238  TAN2=    0.5009  -0.8655   0.0000

LINE CONNECTS KEYPOINTS    233   239
 LINE NO.=   361  KP1=    233  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    239  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    234   240
 LINE NO.=   362  KP1=    234  TAN1=   -0.5201   0.8541   0.0000
                  KP2=    240  TAN2=    0.5201  -0.8541   0.0000

LINE CONNECTS KEYPOINTS    178   185
 LINE NO.=   363  KP1=    178  TAN1=   -0.8541   0.5201   0.0000
                  KP2=    185  TAN2=    0.8541  -0.5201   0.0000

LINE CONNECTS KEYPOINTS    177   184
 LINE NO.=   364  KP1=    177  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    184  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    176   183
 LINE NO.=   365  KP1=    176  TAN1=   -0.8655   0.5009   0.0000
                  KP2=    183  TAN2=    0.8655  -0.5009   0.0000

LINE CONNECTS KEYPOINTS    175   182
 LINE NO.=   366  KP1=    175  TAN1=   -0.9844   0.1762   0.0000
                  KP2=    182  TAN2=    0.9844  -0.1762   0.0000

LINE CONNECTS KEYPOINTS    174   181
 LINE NO.=   367  KP1=    174  TAN1=   -0.9856   0.1691   0.0000
                  KP2=    181  TAN2=    0.9856  -0.1691   0.0000

LINE CONNECTS KEYPOINTS     54    61
 LINE NO.=   368  KP1=     54  TAN1=   -0.9856  -0.1691   0.0000
                  KP2=     61  TAN2=    0.9856   0.1691   0.0000

LINE CONNECTS KEYPOINTS     55    62
 LINE NO.=   369  KP1=     55  TAN1=   -0.9844  -0.1762   0.0000
                  KP2=     62  TAN2=    0.9844   0.1762   0.0000

LINE CONNECTS KEYPOINTS     56    63
 LINE NO.=   370  KP1=     56  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     63  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS     57    64
 LINE NO.=   371  KP1=     57  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     64  TAN2=    0.8584   0.5130   0.0000
```

```
LINE CONNECTS KEYPOINTS     58    65
 LINE NO.=   372  KP1=      58  TAN1=   -0.8541   -0.5201    0.0000
                  KP2=      65  TAN2=    0.8541    0.5201    0.0000

LINE CONNECTS KEYPOINTS    124   131
 LINE NO.=   373  KP1=     124  TAN1=   -0.5201   -0.8541    0.0000
                  KP2=     131  TAN2=    0.5201    0.8541    0.0000

LINE CONNECTS KEYPOINTS    123   130
 LINE NO.=   374  KP1=     123  TAN1=   -0.5130   -0.8584    0.0000
                  KP2=     130  TAN2=    0.5130    0.8584    0.0000

LINE CONNECTS KEYPOINTS    122   129
 LINE NO.=   375  KP1=     122  TAN1=   -0.5009   -0.8655    0.0000
                  KP2=     129  TAN2=    0.5009    0.8655    0.0000

LINE CONNECTS KEYPOINTS    121   128
 LINE NO.=   376  KP1=     121  TAN1=   -0.1762   -0.9844    0.0000
                  KP2=     128  TAN2=    0.1762    0.9844    0.0000

LINE CONNECTS KEYPOINTS    120   127
 LINE NO.=   377  KP1=     120  TAN1=   -0.1691   -0.9856    0.0000
                  KP2=     127  TAN2=    0.1691    0.9856    0.0000

LINE CONNECTS KEYPOINTS    119   126
 LINE NO.=   378  KP1=     119  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     126  TAN2=    0.0000    1.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 lines to fill in lids
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=   379  KP1=     195  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     194  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=   380  KP1=     191  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     190  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=   381  KP1=     187  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      68  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=   382  KP1=      71  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      72  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=   383  KP1=      75  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      76  TAN2=    0.0000    1.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=   384  KP1=     222  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     197  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=   385  KP1=      78  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     110  TAN2=    0.0000    1.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 area set 1, tubes
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    195   196   205   201

    AREA NUMBER =      1

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    200   201   205   204

    AREA NUMBER =      2

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    193   194   200   204

    AREA NUMBER =      3

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    191   192   203   199

    AREA NUMBER =      4

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    198   199   203   202

    AREA NUMBER =      5

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    189   190   198   202

    AREA NUMBER =      6

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    187   188   138   133

    AREA NUMBER =      7

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    133   138    18    13

    AREA NUMBER =      8

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     69    68    13     8

    AREA NUMBER =      9

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     71    70    85    80

    AREA NUMBER =     10

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     80    85    86    81

    AREA NUMBER =     11

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     73    72    81    86

    AREA NUMBER =     12

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     75    74    87    82

    AREA NUMBER =     13

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     82    87    88    83

    AREA NUMBER =     14
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     77    76    83    88

    AREA NUMBER =     15

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   210   215   214

    AREA NUMBER =     16

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    215   210   220   217

    AREA NUMBER =     17

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    216   217   220   219

    AREA NUMBER =     18

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   214   216   219

    AREA NUMBER =     19

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   208   213   151

    AREA NUMBER =     20

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    213   208   159   155

    AREA NUMBER =     21

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    152   155   159   146

    AREA NUMBER =     22

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   151   152   146

    AREA NUMBER =     23

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    134   139   140   135

    AREA NUMBER =     24

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    135   140    20    15

    AREA NUMBER =     25

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19    14    15    20

    AREA NUMBER =     26

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19   139   134    14

    AREA NUMBER =     27

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    25    31    98

    AREA NUMBER =     28
```

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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31     25     26     32

    AREA NUMBER =     29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32     26     39     35

    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92     98     35     39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94     93     99    100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99     93    106    102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102    106    107    103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    100    103    107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156    160    161    157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157    161    148    154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147    153    154    148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147    160    156    153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136    141    142    137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137    142     22     17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21     16     17     22

    AREA NUMBER =     42
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    141    136     16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33     27     28     34

    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34     28     41     37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40     36     37     41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40     27     33     36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204    205    210    209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192    193    204    203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203    204    209    208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208    209    219    159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    202    203    208    145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146    159    160    147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188    189    202    138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138    202    145    139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139    145    146    140

    AREA NUMBER =     56
```

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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142

    AREA NUMBER =     58

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     18   138   139    19

    AREA NUMBER =     59

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     20   140   141    21

    AREA NUMBER =     60

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     70    69    18    85

    AREA NUMBER =     61

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     85    18    19    25

    AREA NUMBER =     62

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     25    19    20    26

    AREA NUMBER =     63

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     26    20    21    27

    AREA NUMBER =     64

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     27    21    22    28

    AREA NUMBER =     65

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     86    85    25    92

    AREA NUMBER =     66

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     39    26    27    40

    AREA NUMBER =     67

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     74    73    86    87

    AREA NUMBER =     68

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     87    86    92    93

    AREA NUMBER =     69

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     93    92    39   106

    AREA NUMBER =     70
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     88    87    93    94

    AREA NUMBER =     71
 area set 3, end guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    196   197   206   205

    AREA NUMBER =     72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205   206   211   210

    AREA NUMBER =     73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206   207   212   211

    AREA NUMBER =     74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210   211   218   220

    AREA NUMBER =     75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148   161   158   149

    AREA NUMBER =     76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142   148   149   143

    AREA NUMBER =     77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143   149   150   144

    AREA NUMBER =     78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22   142   143    23

    AREA NUMBER =     79

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     28    22    23    29

    AREA NUMBER =     80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     29    23    24    30

    AREA NUMBER =     81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    28    29    38

    AREA NUMBER =     82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     95    94   107   104

    AREA NUMBER =     83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     89    88    94    95
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    AREA NUMBER =     84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    89    95    96

    AREA NUMBER =     85

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     78    77    88    89

    AREA NUMBER =     86
 area set 4, corner guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    219   220   221   162

    AREA NUMBER =     87

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    159   219   162   160

    AREA NUMBER =     88

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    160   162   163   161

    AREA NUMBER =     89

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   106    42   109

    AREA NUMBER =     90

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    106    39    40    42

    AREA NUMBER =     91

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     42    40    41    43

    AREA NUMBER =     92

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 area set 5, inner barrier

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    222   223   224   207

    AREA NUMBER =     93

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    207   224   225   212

    AREA NUMBER =     94

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    212   225   226   218

    AREA NUMBER =     95

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    218   226   227   220

    AREA NUMBER =     96

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    220   227   228   221

    AREA NUMBER =     97
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    163   171   170   161

    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104   115   114    96

    AREA NUMBER =    111
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90   113   112   110

    AREA NUMBER =    113
 area set 6, outer barrier

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         1,

*** WARNING ***                          CP=      4.850   TIME= 08:41:36
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.860   TIME= 08:41:36
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.870   TIME= 08:41:36
```

```
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.870   TIME= 08:41:36
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.870   TIME= 08:41:36
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.870   TIME= 08:41:36
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.870   TIME= 08:41:36
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.880   TIME= 08:41:36
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.890   TIME= 08:41:36
Area 41 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      4.890   TIME= 08:41:36
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.890   TIME= 08:41:36
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.890   TIME= 08:41:36
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.900   TIME= 08:41:36
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      4.910   TIME= 08:41:36
Area 64 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      4.910   TIME= 08:41:36
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.910   TIME= 08:41:36
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.920   TIME= 08:41:36
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.930   TIME= 08:41:36
```

```
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 90 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.940   TIME= 08:41:36
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.950   TIME= 08:41:36
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.960   TIME= 08:41:36
Area 111 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      4.960   TIME= 08:41:36
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.960   TIME= 08:41:36
Area 113 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2875     AND   2.2875
  KABS=  0.  TOLERANCE= 0.114375E-01

  113  AREAS (OF   509  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    21  AREAS (OF    509  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                         CP=     11.100   TIME= 08:41:42
Area 441 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.100   TIME= 08:41:42
Area 444 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.100   TIME= 08:41:42
Area 448 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.100   TIME= 08:41:42
Area 451 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 454 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 458 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 461 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 464 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 468 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 471 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 475 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 478 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 482 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 485 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.110   TIME= 08:41:42
Area 488 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 492 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 495 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 498 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 505 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.120   TIME= 08:41:42
Area 509 is not meshed.  Volume will be generated without elements.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2775     AND   2.2775
  KABS=  0.  TOLERANCE= 0.113875E-01

  113  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    373 USED FOR KEYPOINT(S)     521
KEYPOINT    375 USED FOR KEYPOINT(S)     522
KEYPOINT    377 USED FOR KEYPOINT(S)     523
KEYPOINT    379 USED FOR KEYPOINT(S)     458
KEYPOINT    381 USED FOR KEYPOINT(S)     540
KEYPOINT    383 USED FOR KEYPOINT(S)     542
KEYPOINT    385 USED FOR KEYPOINT(S)     496
KEYPOINT    387 USED FOR KEYPOINT(S)     524
KEYPOINT    389 USED FOR KEYPOINT(S)     527
KEYPOINT    391 USED FOR KEYPOINT(S)     528
KEYPOINT    393 USED FOR KEYPOINT(S)     531
KEYPOINT    395 USED FOR KEYPOINT(S)     532
KEYPOINT    397 USED FOR KEYPOINT(S)     533
KEYPOINT    399 USED FOR KEYPOINT(S)     514
KEYPOINT    401 USED FOR KEYPOINT(S)     545
KEYPOINT    403 USED FOR KEYPOINT(S)     544
KEYPOINT    405 USED FOR KEYPOINT(S)     492
KEYPOINT    407 USED FOR KEYPOINT(S)     535
KEYPOINT    409 USED FOR KEYPOINT(S)     538
KEYPOINT    410 USED FOR KEYPOINT(S)     537
LINE    837 USED FOR LINE(S)   1121
LINE    847 USED FOR LINE(S)   1124
LINE    852 USED FOR LINE(S)   1152
LINE    862 USED FOR LINE(S)   1157
LINE    867 USED FOR LINE(S)   1125
LINE    877 USED FOR LINE(S)   1131
LINE    887 USED FOR LINE(S)   1138
LINE    897 USED FOR LINE(S)   1141
LINE    902 USED FOR LINE(S)   1162
LINE    912 USED FOR LINE(S)   1160
LINE    917 USED FOR LINE(S)   1143
LINE    923 USED FOR LINE(S)   1149
```

```
 generate lines to fill in lid at top of WP
 lines tube height

LINE CONNECTS KEYPOINTS    414   421
 LINE NO.=  1121  KP1=    414  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    421  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    422   429
 LINE NO.=  1124  KP1=    422  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    429  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    430   437
 LINE NO.=  1125  KP1=    430  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    437  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    438   445
 LINE NO.=  1131  KP1=    438  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    445  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    446   453
 LINE NO.=  1138  KP1=    446  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    453  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000
  end lines

LINE CONNECTS KEYPOINTS    370   518
 LINE NO.=  1141  KP1=    370  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    518  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    539   413
 LINE NO.=  1143  KP1=    539  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    413  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    832 1116 1120 1141
      (TRAVERSED IN SAME DIRECTION AS LINE   832)

     AREA NUMBER =     687

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    936  937  941 1121
      (TRAVERSED IN SAME DIRECTION AS LINE   936)

     AREA NUMBER =     688

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    946  947  951 1124
      (TRAVERSED IN SAME DIRECTION AS LINE   946)

     AREA NUMBER =     689

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    956  959  961 1125
      (TRAVERSED IN SAME DIRECTION AS LINE   956)

     AREA NUMBER =     690

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    966  969  971 1131
      (TRAVERSED IN SAME DIRECTION AS LINE   966)

     AREA NUMBER =     691

 DEFINE AREA BY LIST OF LINES
      LINE LIST =    976  979  981 1138
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE   976)

    AREA NUMBER =    692

DEFINE AREA BY LIST OF LINES
     LINE LIST =   932 1143 1147 1151
     (TRAVERSED IN SAME DIRECTION AS LINE   932)

    AREA NUMBER =    693

DEFINE AREA BY LIST OF LINES
     LINE LIST =   842 1122 1123
     (TRAVERSED IN SAME DIRECTION AS LINE   842)

    AREA NUMBER =    694

DEFINE AREA BY LIST OF LINES
     LINE LIST =   985  989  990  993
     (TRAVERSED IN SAME DIRECTION AS LINE   985)

    AREA NUMBER =    695

DEFINE AREA BY LIST OF LINES
     LINE LIST =   997 1001 1002 1005
     (TRAVERSED IN SAME DIRECTION AS LINE   997)

    AREA NUMBER =    696

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1010 1013 1015 1018
     (TRAVERSED IN SAME DIRECTION AS LINE  1010)

    AREA NUMBER =    697

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1021 1025 1028 1029
     (TRAVERSED IN SAME DIRECTION AS LINE  1021)

    AREA NUMBER =    698

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1033 1037 1040 1041
     (TRAVERSED IN SAME DIRECTION AS LINE  1033)

    AREA NUMBER =    699

DEFINE AREA BY LIST OF LINES
     LINE LIST =   922 1144 1148
     (TRAVERSED IN SAME DIRECTION AS LINE   922)

    AREA NUMBER =    700

DEFINE AREA BY LIST OF LINES
     LINE LIST =   857 1153 1156
     (TRAVERSED IN SAME DIRECTION AS LINE   857)

    AREA NUMBER =    701

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1046 1049 1051 1054
     (TRAVERSED IN SAME DIRECTION AS LINE  1046)

    AREA NUMBER =    702

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1058 1061 1063 1066
     (TRAVERSED IN SAME DIRECTION AS LINE  1058)

    AREA NUMBER =    703
```

```
 DEFINE AREA BY LIST OF LINES
      LINE LIST =  1070 1073 1075 1078
      (TRAVERSED IN SAME DIRECTION AS LINE  1070)

     AREA NUMBER =     704

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   907 1159 1163
      (TRAVERSED IN SAME DIRECTION AS LINE   907)

     AREA NUMBER =     705

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   872 1126 1130
      (TRAVERSED IN SAME DIRECTION AS LINE   872)

     AREA NUMBER =     706

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   882 1132 1133 1137
      (TRAVERSED IN SAME DIRECTION AS LINE   882)

     AREA NUMBER =     707

 DEFINE AREA BY LIST OF LINES
      LINE LIST =   892 1139 1140
      (TRAVERSED IN SAME DIRECTION AS LINE   892)

     AREA NUMBER =     708

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.3075     AND   2.3075
   KABS=  0.  TOLERANCE= 0.115375E-01

   135  AREAS (OF   708  DEFINED) SELECTED BY  ASEL  COMMAND.

 DRAG ALL SELECTED AREAS
      ALONG LINES
          3,

 *** WARNING ***                          CP=     14.960   TIME= 08:41:46
 Area 514 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.960   TIME= 08:41:46
 Area 518 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.960   TIME= 08:41:46
 Area 522 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 526 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 530 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 534 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 538 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 542 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 546 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
 Area 550 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     14.970   TIME= 08:41:46
```

```
Area 554 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.970   TIME= 08:41:46
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.970   TIME= 08:41:46
Area 562 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.970   TIME= 08:41:46
Area 566 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 578 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 586 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 590 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 595 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.980   TIME= 08:41:46
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 598 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 599 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 601 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 602 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 605 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 607 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      14.990   TIME= 08:41:46
Area 608 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 609 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 610 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 611 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 613 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 614 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 615 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 616 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 617 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 618 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.000   TIME= 08:41:46
Area 619 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 620 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 621 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 622 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 623 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 624 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 625 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 626 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 627 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 629 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.010   TIME= 08:41:46
Area 630 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 633 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 635 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 638 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 639 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.020   TIME= 08:41:46
Area 641 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 642 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 645 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 647 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 650 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.030   TIME= 08:41:46
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 653 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
```

```
Area 654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 656 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 659 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 662 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.040   TIME= 08:41:46
Area 663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 665 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 668 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 671 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.050   TIME= 08:41:46
Area 674 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.060   TIME= 08:41:46
Area 675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.060   TIME= 08:41:46
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.060   TIME= 08:41:46
Area 677 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 678 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 679 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 680 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 681 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 682 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 683 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 684 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.060   TIME= 08:41:46
Area 685 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 686 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 687 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 688 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 689 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 690 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 691 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 692 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 694 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 695 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.070   TIME= 08:41:46
Area 697 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.080   TIME= 08:41:46
Area 698 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.080   TIME= 08:41:46
Area 699 is not meshed.  Volume will be generated without elements.

*** WARNING ***                                CP=      15.080   TIME= 08:41:46
Area 700 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 701 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 703 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 704 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 706 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      15.080   TIME= 08:41:46
Area 708 is not meshed.  Volume will be generated without elements.
 lines at bottom lid used to be here

 Mesh Volumes

 Mesh the CS Tubes

 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=      23.630   TIME= 08:41:55
Meshing of volume 50 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
          241     242     243     244     245     246     247     248
          249     250     251     252     253     254     255     256
          257     258     271     272     273     274     275     276
          277     278     279     280     281     282     283     284
          285     286     287     288


*** WARNING ***                          CP=      25.250   TIME= 08:41:57
Meshing of volume 55 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    55 WITH EXCESSIVE ASPECT RATIO ***
          781     782     783     784     785     786     787     788
          789     790     791     792     793     794     795     796
          797     798     811     812     813     814     815     816
          817     818     819     820     821     822     823     824
          825     826     827     828


*** WARNING ***                          CP=      25.870   TIME= 08:41:58
Meshing of volume 57 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.
```

```
     *** LIST OF ELEMENTS IN VOLUME    57 WITH EXCESSIVE ASPECT RATIO ***
         961     962     963     964     965     966     967     968
         969     970     971     972     973     974     975     976
         977     978     991     992     993     994     995     996
         997     998     999    1000    1001    1002    1003    1004
        1005    1006    1007    1008

*** WARNING ***                          CP=     27.420   TIME= 08:41:59
Meshing of volume 62 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    62 WITH EXCESSIVE ASPECT RATIO ***
        1501    1502    1503    1504    1505    1506    1507    1508
        1509    1510    1511    1512    1513    1514    1515    1516
        1517    1518    1531    1532    1533    1534    1535    1536
        1537    1538    1539    1540    1541    1542    1543    1544
        1545    1546    1547    1548

*** WARNING ***                          CP=     27.950   TIME= 08:42:00
Meshing of volume 64 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    64 WITH EXCESSIVE ASPECT RATIO ***
        1681    1682    1683    1684    1685    1686    1687    1688
        1689    1690    1691    1692    1693    1694    1695    1696
        1697    1698    1711    1712    1713    1714    1715    1716
        1717    1718    1719    1720    1721    1722    1723    1724
        1725    1726    1727    1728

*** WARNING ***                          CP=     29.490   TIME= 08:42:01
Meshing of volume 69 produced 36 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
        2221    2222    2223    2224    2225    2226    2227    2228
        2229    2230    2231    2232    2233    2234    2235    2236
        2237    2238    2251    2252    2253    2254    2255    2256
        2257    2258    2259    2260    2261    2262    2263    2264
        2265    2266    2267    2268


NUMBER OF VOLUMES MESHED    =     24
MAXIMUM NODE NUMBER         =   4000
MAXIMUM ELEMENT NUMBER      =   2520
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP        1

   15  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     30.850   TIME= 08:42:03
Meshing of volume 72 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    72 WITH EXCESSIVE ASPECT RATIO ***
        2521    2536    2551    2566    2581    2596    2611    2626


*** WARNING ***                          CP=     31.070   TIME= 08:42:03
Meshing of volume 73 produced 46 elements with excessive aspect ratio.
```

Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 73 WITH EXCESSIVE ASPECT RATIO ***

2641	2642	2643	2644	2645	2646	2647	2648
2649	2650	2651	2652	2653	2654	2655	2656
2657	2658	2659	2660	2661	2662	2663	2671
2672	2673	2674	2675	2676	2677	2678	2679
2680	2681	2682	2683	2684	2685	2686	2687
2688	2689	2690	2691	2692	2693		

*** WARNING *** CP= 31.420 TIME= 08:42:03
Meshing of volume 74 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 74 WITH EXCESSIVE ASPECT RATIO ***

2701	2702	2703	2716	2717	2718	2731	2732
2733	2746	2747	2748	2761	2762	2763	2776
2777	2778	2791	2792	2793	2806	2807	2808

*** WARNING *** CP= 31.520 TIME= 08:42:04
Volume 75 area 75 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 31.530 TIME= 08:42:04
Volume 75 area 380 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 31.750 TIME= 08:42:04
Meshing of volume 75 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 75 WITH EXCESSIVE DISTORTION ***

2881	2882	2883	2884	2885	2886	2887	2888
2889	2890	2891	2892	2893	2894	2895	2896
2897	2898	2899	2900	2901	2902	2903	2904
2905	2906	2907	2908	2909	2910	2911	2912
2913	2914	2915	2916	2917	2918	2919	2920
2921	2922	2923	2924	2925	2926	2927	2928
2929	2930	2931	2932	2933	2934	2935	2936
2937	2938	2939	2940				

*** WARNING *** CP= 31.870 TIME= 08:42:04
Volume 76 area 76 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 31.890 TIME= 08:42:04
Volume 76 area 384 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 32.110 TIME= 08:42:04
Meshing of volume 76 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 76 WITH EXCESSIVE DISTORTION ***

2941	2942	2945	2946	2949	2950	2953	2954
2957	2958	2961	2962	2965	2966	2969	2970
2973	2974	2977	2978	2981	2982	2985	2986
2989	2990	2993	2994	2997	2998	3001	3002
3005	3006	3009	3010	3013	3014	3017	3018
3021	3022	3025	3026	3029	3030	3033	3034
3037	3038	3041	3042	3045	3046	3049	3050
3053	3054	3057	3058				

*** WARNING *** CP= 32.340 TIME= 08:42:04
Meshing of volume 77 produced 46 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 77 WITH EXCESSIVE ASPECT RATIO ***

```
      3061    3062    3063    3064    3065    3066    3067    3068
      3069    3070    3071    3072    3073    3074    3075    3076
      3077    3078    3079    3080    3081    3082    3091    3092
      3093    3094    3095    3096    3097    3098    3099    3100
      3101    3102    3103    3104    3105    3106    3107    3108
      3109    3110    3111    3112    3113    3114

*** WARNING ***                         CP=     32.680   TIME= 08:42:05
Meshing of volume 78 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    78 WITH EXCESSIVE ASPECT RATIO ***
      3121    3122    3123    3124    3125    3126    3151    3152
      3153    3154    3155    3156    3181    3182    3183    3184
      3185    3186    3211    3212    3213    3214    3215    3216

*** WARNING ***                         CP=     33.240   TIME= 08:42:05
Meshing of volume 80 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    80 WITH EXCESSIVE ASPECT RATIO ***
      3361    3362    3363    3364    3365    3366    3367    3368
      3369    3370    3371    3372    3373    3374    3375    3376
      3377    3378    3379    3380    3381    3382    3391    3392
      3393    3394    3395    3396    3397    3398    3399    3400
      3401    3402    3403    3404    3405    3406    3407    3408
      3409    3410    3411    3412    3413    3414

*** WARNING ***                         CP=     33.560   TIME= 08:42:06
Meshing of volume 81 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    81 WITH EXCESSIVE ASPECT RATIO ***
      3421    3422    3423    3424    3425    3426    3451    3452
      3453    3454    3455    3456    3481    3482    3483    3484
      3485    3486    3511    3512    3513    3514    3515    3516

*** WARNING ***                         CP=     33.660   TIME= 08:42:06
Volume 82 area 82 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     33.680   TIME= 08:42:06
Volume 82 area 404 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     33.910   TIME= 08:42:06
Meshing of volume 82 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    82 WITH EXCESSIVE DISTORTION ***
      3543    3544    3547    3548    3551    3552    3555    3556
      3559    3560    3563    3564    3567    3568    3571    3572
      3575    3576    3579    3580    3583    3584    3587    3588
      3591    3592    3595    3596    3599    3600    3603    3604
      3607    3608    3611    3612    3615    3616    3619    3620
      3623    3624    3627    3628    3631    3632    3635    3636
      3639    3640    3643    3644    3647    3648    3651    3652
      3655    3656    3659    3660

*** WARNING ***                         CP=     34.020   TIME= 08:42:06
Volume 83 area 83 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     34.030   TIME= 08:42:06
Volume 83 area 408 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.
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*** WARNING ***                         CP=     34.250   TIME= 08:42:06
Meshing of volume 83 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    83 WITH EXCESSIVE DISTORTION ***
         3721    3722    3723    3724    3725    3726    3727    3728
         3729    3730    3731    3732    3733    3734    3735    3736
         3737    3738    3739    3740    3741    3742    3743    3744
         3745    3746    3747    3748    3749    3750    3751    3752
         3753    3754    3755    3756    3757    3758    3759    3760
         3761    3762    3763    3764    3765    3766    3767    3768
         3769    3770    3771    3772    3773    3774    3775    3776
         3777    3778    3779    3780


*** WARNING ***                         CP=     34.480   TIME= 08:42:07
Meshing of volume 84 produced 46 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         3781    3782    3783    3784    3785    3786    3787    3788
         3789    3790    3791    3792    3796    3797    3798    3799
         3800    3801    3802    3803    3804    3805    3806    3811
         3812    3813    3814    3815    3816    3817    3818    3819
         3820    3821    3822    3826    3827    3828    3829    3830
         3831    3832    3833    3834    3835    3836


*** WARNING ***                         CP=     34.810   TIME= 08:42:07
Meshing of volume 85 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    85 WITH EXCESSIVE ASPECT RATIO ***
         3841    3842    3843    3856    3857    3858    3871    3872
         3873    3886    3887    3888    3901    3902    3903    3916
         3917    3918    3931    3932    3933    3946    3947    3948


*** WARNING ***                         CP=     35.140   TIME= 08:42:07
Meshing of volume 86 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    86 WITH EXCESSIVE ASPECT RATIO ***
         3961    3976    3991    4006    4021    4036    4051    4066


NUMBER OF VOLUMES MESHED   =     15
MAXIMUM NODE NUMBER        =   6448
MAXIMUM ELEMENT NUMBER     =   4080
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP       1

   6  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     35.840   TIME= 08:42:08
Meshing of volume 88 produced 44 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
         4201    4202    4203    4204    4205    4206    4207    4208
         4209    4210    4211    4212    4213    4214    4215    4216
         4217    4218    4219    4220    4221    4231    4232    4233
```

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      4234    4235    4236    4237    4238    4239    4240    4241
      4242    4243    4244    4245    4246    4247    4248    4249
      4250    4251    4252    4253

 *** WARNING ***                          CP=     36.740   TIME= 08:42:09
 Meshing of volume 91 produced 44 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
      4501    4502    4503    4504    4505    4506    4507    4508
      4509    4510    4511    4512    4513    4514    4515    4516
      4517    4518    4519    4520    4522    4531    4532    4533
      4534    4535    4536    4537    4538    4539    4540    4541
      4542    4543    4544    4545    4546    4547    4548    4549
      4550    4551    4552    4554

 NUMBER OF VOLUMES MESHED   =      6
 MAXIMUM NODE NUMBER        =   7280
 MAXIMUM ELEMENT NUMBER     =   4680
  Mesh Inner Barrier

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3045
   KABS=  0.  TOLERANCE= 0.000000E+00

   269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.71295
   KABS=  0.  TOLERANCE= 0.000000E+00

   269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       92 STEP       1

    177  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.69095     AND  0.71295
   KABS=  0.  TOLERANCE= 0.000000E+00

    114  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
   KABS=  0.  TOLERANCE= 0.000000E+00

   197  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO       92 STEP       1

    147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
   KABS=  0.  TOLERANCE= 0.000000E+00

    147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

 RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.70000E-02 AND   2.3045
   KABS=  0.  TOLERANCE= 0.000000E+00

   147  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 ELEMENT TYPE SET TO      5

 MATERIAL NUMBER SET TO     5
```

GENERATE NODES AND ELEMENTS IN ALL SELECTED VOLUMES

*** WARNING *** CP= 40.830 TIME= 08:42:13
Meshing of volume 93 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 93 WITH EXCESSIVE ASPECT RATIO ***

4681	4682	4683	4684	4685	4686	4696	4697
4698	4699	4700	4701	4711	4712	4713	4714
4715	4716	4726	4727	4728	4729	4730	4731
4741	4742	4743	4744	4745	4746	4756	4757
4758	4759	4760	4761	4771	4772	4773	4774
4775	4776	4786	4787	4788	4789	4790	4791

*** WARNING *** CP= 41.050 TIME= 08:42:13
Meshing of volume 94 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 94 WITH EXCESSIVE ASPECT RATIO ***

4801	4802	4803	4804	4805	4806	4807	4808
4809	4810	4811	4812	4813	4814	4815	4816
4817	4818	4819	4820	4821	4822	4823	4824
4825	4826	4827	4828	4829	4830	4831	4832
4833	4834	4835	4836	4837	4838	4839	4840
4841	4842	4843	4844	4845	4846	4847	4848
4849	4850	4851	4852	4853	4854	4855	4856
4857	4858	4859	4860				

*** WARNING *** CP= 41.480 TIME= 08:42:14
Meshing of volume 95 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 95 WITH EXCESSIVE ASPECT RATIO ***

4861	4862	4863	4864	4865	4866	4891	4892
4893	4894	4895	4896	4921	4922	4923	4924
4925	4926	4951	4952	4953	4954	4955	4956

*** WARNING *** CP= 41.690 TIME= 08:42:14
Meshing of volume 96 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 96 WITH EXCESSIVE ASPECT RATIO ***

4981	4982	4983	4984	4985	4986	4987	4988
4989	4990	4991	4992	4993	4994	4995	4996
4997	4998	4999	5000	5001	5002	5003	5004
5005	5006	5011	5012	5013	5014	5015	5016
5017	5018	5019	5020	5021	5022	5023	5024
5025	5026	5027	5028	5029	5030	5031	5032
5033	5034	5035	5036				

*** WARNING *** CP= 41.900 TIME= 08:42:14
Meshing of volume 97 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 97 WITH EXCESSIVE ASPECT RATIO ***

5041	5042	5043	5044	5045	5046	5047	5048
5049	5050	5051	5052	5053	5054	5055	5056
5057	5058	5059	5060	5061	5062	5063	5064
5065	5066	5067	5068	5069	5070	5071	5072
5073	5074	5075	5076	5077	5078	5079	5080
5081	5082	5083	5084	5085	5086	5087	5088
5089	5090	5091	5092	5093	5094	5095	5096
5097	5098	5099	5100				

*** WARNING *** CP= 42.340 TIME= 08:42:14
Meshing of volume 98 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 98 WITH EXCESSIVE ASPECT RATIO ***

5101	5102	5131	5132	5161	5162	5191	5192

*** WARNING *** CP= 42.570 TIME= 08:42:15
Meshing of volume 99 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 99 WITH EXCESSIVE ASPECT RATIO ***

5221	5222	5223	5224	5225	5226	5227	5228
5229	5230	5231	5232	5233	5234	5235	5236
5237	5238	5239	5240	5241	5242	5243	5244
5245	5246	5247	5248	5249	5250	5251	5252
5253	5254	5255	5256	5257	5258	5259	5260
5261	5262	5263	5264	5265	5266	5267	5268
5269	5270	5271	5272	5273	5274	5275	5276
5277	5278	5279	5280				

*** WARNING *** CP= 42.800 TIME= 08:42:15
Meshing of volume 100 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 100 WITH EXCESSIVE ASPECT RATIO ***

5281	5282	5283	5284	5285	5286	5287	5288
5289	5290	5291	5292	5293	5294	5295	5296
5297	5298	5299	5300	5301	5302	5303	5304
5305	5306	5311	5312	5313	5314	5315	5316
5317	5318	5319	5320	5321	5322	5323	5324
5325	5326	5327	5328	5329	5330	5331	5332
5333	5334	5335	5336				

*** WARNING *** CP= 43.240 TIME= 08:42:15
Meshing of volume 101 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 101 WITH EXCESSIVE ASPECT RATIO ***

5341	5342	5343	5344	5345	5346	5371	5372
5373	5374	5375	5376	5401	5402	5403	5404
5405	5406	5431	5432	5433	5434	5435	5436

*** WARNING *** CP= 43.450 TIME= 08:42:15
Meshing of volume 102 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 102 WITH EXCESSIVE ASPECT RATIO ***

5461	5462	5463	5464	5465	5466	5467	5468
5469	5470	5471	5472	5473	5474	5475	5476
5477	5478	5479	5480	5481	5482	5483	5484
5485	5486	5487	5488	5489	5490	5491	5492
5493	5494	5495	5496	5497	5498	5499	5500
5501	5502	5503	5504	5505	5506	5507	5508
5509	5510	5511	5512	5513	5514	5515	5516
5517	5518	5519	5520				

*** WARNING *** CP= 43.900 TIME= 08:42:16
Meshing of volume 103 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 103 WITH EXCESSIVE ASPECT RATIO ***

5521	5522	5523	5524	5525	5526	5551	5552
5553	5554	5555	5556	5581	5582	5583	5584
5585	5586	5611	5612	5613	5614	5615	5616

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*** WARNING ***                         CP=     44.570   TIME= 08:42:17
Meshing of volume 119 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   119 WITH EXCESSIVE ASPECT RATIO ***
         5697    5698    5699    5700    5701    5702    5703    5704
         5705    5706    5707    5708    5709    5710    5711    5712


*** WARNING ***                         CP=     45.450   TIME= 08:42:18
Meshing of volume 137 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   137 WITH EXCESSIVE ASPECT RATIO ***
         5793    5794    5795    5796    5797    5798    5799    5800
         5801    5802    5803    5804    5805    5806    5807    5808


*** WARNING ***                         CP=     45.730   TIME= 08:42:18
Meshing of volume 140 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   140 WITH EXCESSIVE ASPECT RATIO ***
         5825    5826    5827    5828    5829    5830    5831    5832
         5833    5834    5835    5836    5837    5838    5839    5840


*** WARNING ***                         CP=     46.010   TIME= 08:42:18
Meshing of volume 143 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   143 WITH EXCESSIVE ASPECT RATIO ***
         5857    5858    5859    5860    5861    5862    5863    5864
         5865    5866    5867    5868    5869    5870    5871    5872


*** WARNING ***                         CP=     46.220   TIME= 08:42:18
Meshing of volume 145 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   145 WITH EXCESSIVE ASPECT RATIO ***
         5881    5882    5883    5884    5885    5886    5887    5888
         5889    5890    5891    5892    5893    5894    5895    5896


*** WARNING ***                         CP=     52.410   TIME= 08:42:25
Volume 230 area 669 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.420   TIME= 08:42:25
Volume 230 area 1058 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.460   TIME= 08:42:25
Meshing of volume 230 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   230 WITH EXCESSIVE DISTORTION ***
         6657    6658    6659    6660    6661    6662    6663    6664


*** WARNING ***                         CP=     52.520   TIME= 08:42:25
Volume 231 area 670 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     52.530   TIME= 08:42:25
Volume 231 area 1061 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.
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*** WARNING ***                         CP=     52.580   TIME= 08:42:25
Meshing of volume 231 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   231 WITH EXCESSIVE DISTORTION ***
         6665    6666    6669    6670    6673    6674    6677    6678


*** WARNING ***                         CP=     53.070   TIME= 08:42:25
Volume 237 area 676 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.080   TIME= 08:42:25
Volume 237 area 1078 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.120   TIME= 08:42:26
Meshing of volume 237 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   237 WITH EXCESSIVE DISTORTION ***
         6747    6748    6751    6752    6755    6756    6759    6760


*** WARNING ***                         CP=     53.180   TIME= 08:42:26
Volume 238 area 677 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.190   TIME= 08:42:26
Volume 238 area 1081 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     53.230   TIME= 08:42:26
Meshing of volume 238 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   238 WITH EXCESSIVE DISTORTION ***
         6769    6770    6771    6772    6773    6774    6775    6776


*** WARNING ***                         CP=     55.010   TIME= 08:42:28
Volume 255 area 694 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     55.030   TIME= 08:42:28
Volume 255 area 1119 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     55.100   TIME= 08:42:28
Meshing of volume 255 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   255 WITH EXCESSIVE DISTORTION ***
         7121    7122    7123    7124    7125    7126    7127    7128
         7130    7132    7134    7136    7138    7142


*** WARNING ***                         CP=     55.770   TIME= 08:42:28
Volume 261 area 700 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     55.790   TIME= 08:42:28
Volume 261 area 1125 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     55.850   TIME= 08:42:28
Meshing of volume 261 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   261 WITH EXCESSIVE DISTORTION ***
         7306    7310    7313    7314    7317    7318    7321    7322
         7323    7324    7325    7326    7327    7328


*** WARNING ***                         CP=     55.950   TIME= 08:42:29
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Meshing of volume 262 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   262 WITH EXCESSIVE DISTORTION ***
         7338    7342


*** WARNING ***                          CP=     56.450   TIME= 08:42:29
Meshing of volume 266 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   266 WITH EXCESSIVE DISTORTION ***
         7458    7462


*** WARNING ***                          CP=     56.480   TIME= 08:42:29
Volume 267 area 706 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.490   TIME= 08:42:29
Volume 267 area 1131 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.550   TIME= 08:42:29
Meshing of volume 267 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   267 WITH EXCESSIVE DISTORTION ***
         7474    7478    7481    7482    7485    7486    7489    7490
         7491    7492    7493    7494    7495    7496


*** WARNING ***                          CP=     56.730   TIME= 08:42:30
Volume 269 area 708 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.750   TIME= 08:42:30
Volume 269 area 1133 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     56.820   TIME= 08:42:30
Meshing of volume 269 produced 14 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   269 WITH EXCESSIVE DISTORTION ***
         7529    7530    7531    7532    7533    7534    7535    7536
         7538    7540    7542    7544    7546    7550


NUMBER OF VOLUMES MESHED   =    147
MAXIMUM NODE NUMBER        =  11541
MAXIMUM ELEMENT NUMBER     =   7552
 Mesh Upper Inner Barrier Adding Backfill Mass

INVERT      FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP        1

  122  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT      FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
  KABS=  0.  TOLERANCE= 0.000000E+00

   122  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

RESELECT      FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3045
  KABS=  0.  TOLERANCE= 0.000000E+00

  122  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT      FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1
```

30 VOLUMES (OF 269 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ELEMENT TYPE SET TO 6

MATERIAL NUMBER SET TO 6

GENERATE NODES AND ELEMENTS IN ALL SELECTED VOLUMES

*** WARNING *** CP= 57.490 TIME= 08:42:30
Meshing of volume 104 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 104 WITH EXCESSIVE ASPECT RATIO ***

7553	7554	7555	7556	7557	7558	7559	7560
7561	7562	7563	7564	7565	7566	7567	7568
7569	7570	7571	7572	7573	7574	7575	7576
7577	7578	7579	7580	7581	7582	7583	7584
7585	7586	7587	7588	7589	7590	7591	7592
7593	7594	7595	7596	7597	7598	7599	7600
7601	7602	7603	7604	7605	7606	7607	7608
7609	7610	7611	7612				

*** WARNING *** CP= 57.780 TIME= 08:42:31
Meshing of volume 105 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 105 WITH EXCESSIVE ASPECT RATIO ***

7613	7614	7615	7616	7617	7618	7643	7644
7645	7646	7647	7648	7673	7674	7675	7676
7677	7678	7703	7704	7705	7706	7707	7708

*** WARNING *** CP= 57.950 TIME= 08:42:31
Meshing of volume 106 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 106 WITH EXCESSIVE ASPECT RATIO ***

7733	7734	7735	7736	7737	7738	7739	7740
7741	7742	7743	7744	7745	7746	7747	7748
7749	7750	7751	7752	7753	7754	7755	7756
7757	7758	7763	7764	7765	7766	7767	7768
7769	7770	7771	7772	7773	7774	7775	7776
7777	7778	7779	7780	7781	7782	7783	7784
7785	7786	7787	7788				

*** WARNING *** CP= 58.160 TIME= 08:42:32
Meshing of volume 107 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 107 WITH EXCESSIVE ASPECT RATIO ***

7793	7794	7795	7796	7797	7798	7799	7800
7801	7802	7803	7804	7805	7806	7807	7808
7809	7810	7811	7812	7813	7814	7815	7816
7817	7818	7819	7820	7821	7822	7823	7824
7825	7826	7827	7828	7829	7830	7831	7832
7833	7834	7835	7836	7837	7838	7839	7840
7841	7842	7843	7844	7845	7846	7847	7848
7849	7850	7851	7852				

*** WARNING *** CP= 58.540 TIME= 08:42:32
Meshing of volume 108 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 108 WITH EXCESSIVE ASPECT RATIO ***

7853	7854	7883	7884	7913	7914	7943	7944

*** WARNING *** CP= 58.760 TIME= 08:42:32
Meshing of volume 109 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 109 WITH EXCESSIVE ASPECT RATIO ***

7973	7974	7975	7976	7977	7978	7979	7980
7981	7982	7983	7984	7985	7986	7987	7988
7989	7990	7991	7992	7993	7994	7995	7996
7997	7998	7999	8000	8001	8002	8003	8004
8005	8006	8007	8008	8009	8010	8011	8012
8013	8014	8015	8016	8017	8018	8019	8020
8021	8022	8023	8024	8025	8026	8027	8028
8029	8030	8031	8032				

*** WARNING *** CP= 58.970 TIME= 08:42:32
Meshing of volume 110 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 110 WITH EXCESSIVE ASPECT RATIO ***

8033	8034	8035	8036	8037	8038	8039	8040
8041	8042	8043	8044	8045	8046	8047	8048
8049	8050	8051	8052	8053	8054	8055	8056
8057	8058	8063	8064	8065	8066	8067	8068
8069	8070	8071	8072	8073	8074	8075	8076
8077	8078	8079	8080	8081	8082	8083	8084
8085	8086	8087	8088				

*** WARNING *** CP= 59.410 TIME= 08:42:33
Meshing of volume 111 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 111 WITH EXCESSIVE ASPECT RATIO ***

8093	8094	8095	8096	8097	8098	8123	8124
8125	8126	8127	8128	8153	8154	8155	8156
8157	8158	8183	8184	8185	8186	8187	8188

*** WARNING *** CP= 59.620 TIME= 08:42:33
Meshing of volume 112 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 112 WITH EXCESSIVE ASPECT RATIO ***

8213	8214	8215	8216	8217	8218	8219	8220
8221	8222	8223	8224	8225	8226	8227	8228
8229	8230	8231	8232	8233	8234	8235	8236
8237	8238	8239	8240	8241	8242	8243	8244
8245	8246	8247	8248	8249	8250	8251	8252
8253	8254	8255	8256	8257	8258	8259	8260
8261	8262	8263	8264	8265	8266	8267	8268
8269	8270	8271	8272				

*** WARNING *** CP= 59.990 TIME= 08:42:33
Meshing of volume 113 produced 48 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 113 WITH EXCESSIVE ASPECT RATIO ***

8273	8274	8275	8276	8277	8278	8279	8280
8281	8282	8283	8284	8303	8304	8305	8306
8307	8308	8309	8310	8311	8312	8313	8314
8333	8334	8335	8336	8337	8338	8339	8340
8341	8342	8343	8344	8363	8364	8365	8366
8367	8368	8369	8370	8371	8372	8373	8374

*** WARNING *** CP= 60.490 TIME= 08:42:34

```
Meshing of volume 129 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   129 WITH EXCESSIVE ASPECT RATIO ***
         8433    8434    8435    8436    8437    8438    8439    8440
         8441    8442    8443    8444    8445    8446    8447    8448


*** WARNING ***                         CP=     61.130   TIME= 08:42:35
Meshing of volume 147 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   147 WITH EXCESSIVE ASPECT RATIO ***
         8513    8514    8515    8516    8517    8518    8519    8520
         8521    8522    8523    8524    8525    8526    8527    8528


*** WARNING ***                         CP=     61.380   TIME= 08:42:35
Meshing of volume 150 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   150 WITH EXCESSIVE ASPECT RATIO ***
         8545    8546    8547    8548    8549    8550    8551    8552
         8553    8554    8555    8556    8557    8558    8559    8560


*** WARNING ***                         CP=     61.630   TIME= 08:42:35
Meshing of volume 153 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   153 WITH EXCESSIVE ASPECT RATIO ***
         8577    8578    8579    8580    8581    8582    8583    8584
         8585    8586    8587    8588    8589    8590    8591    8592


NUMBER OF VOLUMES MESHED   =     30
MAXIMUM NODE NUMBER        =  12897
MAXIMUM ELEMENT NUMBER     =   8616
 Mesh Lower Outer Barrier and Lids
 mesh upper outer barrier adding backfill mass

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   555  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     62.160   TIME= 08:42:36
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   555

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   606  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   Z
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     62.570   TIME= 08:42:36
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=  1161
```

```
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  1.0675     AND   1.5450
  KABS=  0.  TOLERANCE= 0.000000E+00

  1818  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71195     AND  0.71395
  KABS=  0.  TOLERANCE= 0.000000E+00

   262  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    35  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   12897 BY       1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP        1

   269  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO     1133 STEP        1

 1133  AREAS (OF  1133  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO     1604 STEP        1

 1604  LINES (OF  1604  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO     9001 STEP        1

   690  KEYPOINTS (OF    690  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO     8616 STEP        1

  8616  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT   FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO    12897 STEP        1

 12897  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= adjust.db
 FOR POSSIBLE RESUME FROM THIS POINT


***** ROUTINE COMPLETED *****  CP =        71.170


*****  ANSYS SOLUTION ROUTINE  *****

PERFORM A MODAL ANALYSIS
 THIS WILL BE A NEW ANALYSIS
```

```
USE SUBSPACE ITERATION METHOD
 EXTRACT    8 MODES
 NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF       1
   FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= adjust.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2881 has an angle between adjacent edges of 36.9687852 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2881 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2882 has an angle between adjacent edges of 36.9602219 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2882 has an angle between adjacent edges of 143.031215 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2883 has an angle between adjacent edges of 36.9687852 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.140   TIME= 08:42:56
Element 2883 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
Element 2884 has an angle between adjacent edges of 36.9602219 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
Element 2884 has an angle between adjacent edges of 143.031215 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
Element 2885 has an angle between adjacent edges of 36.9687852 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
Element 2885 has an angle between adjacent edges of 143.022369 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
Element 2886 has an angle between adjacent edges of 36.9602219 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=     82.150   TIME= 08:42:56
```

Element 2886 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2887 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2887 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2888 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2888 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2889 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.160 TIME= 08:42:56
Element 2889 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.170 TIME= 08:42:56
Element 2890 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.170 TIME= 08:42:56
Element 2890 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.170 TIME= 08:42:56
Element 2891 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.170 TIME= 08:42:56
Element 2891 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.170 TIME= 08:42:56
Element 2892 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.180 TIME= 08:42:56
Element 2892 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.180 TIME= 08:42:56
Element 2893 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.180 TIME= 08:42:56

Element 2893 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.180 TIME= 08:42:56
Element 2894 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.180 TIME= 08:42:56
Element 2894 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.190 TIME= 08:42:56
Element 2895 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.190 TIME= 08:42:56
Element 2895 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.190 TIME= 08:42:56
Element 2896 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.190 TIME= 08:42:56
Element 2896 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2897 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2897 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2898 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2898 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2899 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.200 TIME= 08:42:56
Element 2899 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.210 TIME= 08:42:56
Element 2900 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.210 TIME= 08:42:56

Element 2900 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.210 TIME= 08:42:56
Element 2901 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.210 TIME= 08:42:56
Element 2901 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.210 TIME= 08:42:56
Element 2902 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2902 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2903 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2903 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2904 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2904 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.220 TIME= 08:42:56
Element 2905 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.230 TIME= 08:42:56
Element 2905 has an angle between adjacent edges of 143.022369 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.230 TIME= 08:42:56
Element 2906 has an angle between adjacent edges of 36.9602219 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.230 TIME= 08:42:56
Element 2906 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.230 TIME= 08:42:56
Element 2907 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.230 TIME= 08:42:56

Element 2907 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2908 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2908 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2909 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2909 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2910 has an angle between adjacent edges of 36.9602219 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.240 TIME= 08:42:56
Element 2910 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2911 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2911 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2912 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2912 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2913 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.250 TIME= 08:42:56
Element 2913 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2914 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2914 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45

degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2915 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2915 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2916 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.260 TIME= 08:42:56
Element 2916 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2917 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2917 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2918 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2918 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2919 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2919 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.270 TIME= 08:42:56
Element 2920 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.280 TIME= 08:42:56
Element 2920 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.280 TIME= 08:42:56
Element 2921 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.280 TIME= 08:42:56
Element 2921 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.280 TIME= 08:42:56

Element 2922 has an angle between adjacent edges of 30.464372 on face 2
which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.280 TIME= 08:42:56
Element 2922 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.290 TIME= 08:42:56
Element 2923 has an angle between adjacent edges of 30.4729354 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.290 TIME= 08:42:56
Element 2923 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.290 TIME= 08:42:56
Element 2924 has an angle between adjacent edges of 30.464372 on face 2
which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.290 TIME= 08:42:56
Element 2924 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.290 TIME= 08:42:56
Element 2925 has an angle between adjacent edges of 30.4729354 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.300 TIME= 08:42:56
Element 2925 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.300 TIME= 08:42:56
Element 2926 has an angle between adjacent edges of 30.464372 on face 2
which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.300 TIME= 08:42:56
Element 2926 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.300 TIME= 08:42:56
Element 2927 has an angle between adjacent edges of 30.4729354 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.300 TIME= 08:42:56
Element 2927 has an angle between adjacent edges of 149.518219 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.310 TIME= 08:42:56
Element 2928 has an angle between adjacent edges of 30.464372 on face 2
which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.310 TIME= 08:42:56
Element 2928 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.310 TIME= 08:42:56
Element 2929 has an angle between adjacent edges of 30.4729354 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.310 TIME= 08:42:56
Element 2929 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.310 TIME= 08:42:56
Element 2930 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2930 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2931 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2931 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2932 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2932 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.320 TIME= 08:42:56
Element 2933 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.330 TIME= 08:42:56
Element 2933 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.330 TIME= 08:42:56
Element 2934 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.330 TIME= 08:42:56
Element 2934 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.330 TIME= 08:42:56
Element 2935 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.330 TIME= 08:42:56
Element 2935 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2936 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2936 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2937 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2937 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2938 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.340 TIME= 08:42:56
Element 2938 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.350 TIME= 08:42:56
Element 2939 has an angle between adjacent edges of 30.4729354 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.350 TIME= 08:42:56
Element 2939 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.350 TIME= 08:42:56
Element 2940 has an angle between adjacent edges of 30.464372 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.350 TIME= 08:42:56
Element 2940 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.350 TIME= 08:42:56
Element 2941 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56
Element 2941 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56
Element 2942 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56
Element 2942 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56
Element 2945 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56
Element 2945 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.360 TIME= 08:42:56

Element 2946 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.370 TIME= 08:42:56
Element 2946 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.370 TIME= 08:42:56
Element 2949 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.370 TIME= 08:42:56
Element 2949 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.370 TIME= 08:42:56
Element 2950 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.370 TIME= 08:42:56
Element 2950 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.380 TIME= 08:42:56
Element 2953 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.380 TIME= 08:42:56
Element 2953 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.380 TIME= 08:42:56
Element 2954 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.380 TIME= 08:42:56
Element 2954 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2957 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2957 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2958 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2958 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56

Element 2961 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2961 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.390 TIME= 08:42:56
Element 2962 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.400 TIME= 08:42:56
Element 2962 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.400 TIME= 08:42:56
Element 2965 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.400 TIME= 08:42:56
Element 2965 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.400 TIME= 08:42:56
Element 2966 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.400 TIME= 08:42:56
Element 2966 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.410 TIME= 08:42:56
Element 2969 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.410 TIME= 08:42:56
Element 2969 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.410 TIME= 08:42:56
Element 2970 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.410 TIME= 08:42:56
Element 2970 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.420 TIME= 08:42:56
Element 2973 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.420 TIME= 08:42:56
Element 2973 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.420 TIME= 08:42:56

Element 2974 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.420 TIME= 08:42:56
Element 2974 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.420 TIME= 08:42:56
Element 2977 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.430 TIME= 08:42:56
Element 2977 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.430 TIME= 08:42:56
Element 2978 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.430 TIME= 08:42:56
Element 2978 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.430 TIME= 08:42:56
Element 2981 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.430 TIME= 08:42:56
Element 2981 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.440 TIME= 08:42:56
Element 2982 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.440 TIME= 08:42:56
Element 2982 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.440 TIME= 08:42:56
Element 2985 has an angle between adjacent edges of 36.9687852 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.440 TIME= 08:42:56
Element 2985 has an angle between adjacent edges of 149.527065 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.440 TIME= 08:42:56
Element 2986 has an angle between adjacent edges of 143.031215 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56
Element 2986 has an angle between adjacent edges of 143.031215 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56

Element 2989 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56
Element 2989 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56
Element 2990 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56
Element 2990 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.450 TIME= 08:42:56
Element 2993 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.460 TIME= 08:42:56
Element 2993 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.460 TIME= 08:42:56
Element 2994 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.460 TIME= 08:42:56
Element 2994 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.460 TIME= 08:42:56
Element 2997 has an angle between adjacent edges of 36.9687852 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.460 TIME= 08:42:56
Element 2997 has an angle between adjacent edges of 149.527065 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.470 TIME= 08:42:56
Element 2998 has an angle between adjacent edges of 143.031215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.470 TIME= 08:42:56
Element 2998 has an angle between adjacent edges of 143.031215 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.470 TIME= 08:42:56
Element 3001 has an angle between adjacent edges of 36.9776312 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.470 TIME= 08:42:56
Element 3001 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56

Element 3002 has an angle between adjacent edges of 143.022369 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56
Element 3002 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56
Element 3005 has an angle between adjacent edges of 36.9776312 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56
Element 3005 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56
Element 3006 has an angle between adjacent edges of 143.022369 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.480 TIME= 08:42:56
Element 3006 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.490 TIME= 08:42:56
Element 3009 has an angle between adjacent edges of 36.9776312 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.490 TIME= 08:42:56
Element 3009 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.490 TIME= 08:42:56
Element 3010 has an angle between adjacent edges of 143.022369 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.490 TIME= 08:42:56
Element 3010 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.500 TIME= 08:42:56
Element 3013 has an angle between adjacent edges of 36.9776312 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.500 TIME= 08:42:56
Element 3013 has an angle between adjacent edges of 149.518219 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.500 TIME= 08:42:56
Element 3014 has an angle between adjacent edges of 143.022369 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.500 TIME= 08:42:56
Element 3014 has an angle between adjacent edges of 143.022369 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 82.510 TIME= 08:42:56

```
 Element 3017 has an angle between adjacent edges of 36.9776312 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=      82.510   TIME= 08:42:56
 Element 3017 has an angle between adjacent edges of 149.518219 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=      82.510   TIME= 08:42:56
 Element 3018 has an angle between adjacent edges of 143.022369 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.

 *** WARNING ***                         CP=      82.510   TIME= 08:42:56
 Element 3018 has an angle between adjacent edges of 143.022369 on face
  4 which is outside the recommended range of 90 plus or minus 45
  degrees.

 ***************************************************************************
 Error messages discontinued after 200 messages were displayed.
  More may exist.  See ( adjust.err ) for suppressed messages.
 ***************************************************************************

 *** NOTE ***                             CP=      86.460   TIME= 08:43:01
 The model data was checked and warning messages were found.
  Please review output or errors file ( adjust.err ) for these warning
  messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   08:43:01  APR 11, 1996 CP=     86.460
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
  NUMBER OF MODES TO EXTRACT. . . . . .     8

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1



          ***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

 CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

 TOTAL MASS =   6157.5

                          MOM. OF INERTIA          MOM. OF INERTIA
    CENTROID               ABOUT ORIGIN             ABOUT CENTROID

 XC =  0.40540        IXX =   0.1261E+05       IXX =    3305.
 YC =  0.40804        IYY =   0.1231E+05       IYY =    3015.
 ZC =   1.1596        IZZ =    2880.           IZZ =    842.5
                      IXY =   -881.1           IXY =    137.4
                      IYZ =   -2895.           IYZ =    18.48
                      IZX =   -2890.           IZX =    4.899

 *** MASS SUMMARY BY ELEMENT TYPE ***
```

TYPE	MASS
2	491.306
3	332.670
4	180.515
5	95.0035
6	5057.97

Range of element maximum matrix coefficients in global coordinates
Maximum= 5.474720139E+11 at element 5101.
Minimum= 148626650 at element 6476.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	14.520	0.006
3	1560	SOLID45	8.880	0.006
4	600	SOLID45	3.580	0.006
5	2872	SOLID45	16.550	0.006
6	1064	SOLID45	6.090	0.006

Time at end of element matrix formulatior CP= 145.67.

Estimated number of active DOF= 37495.
Maximum wavefront= 1397.

Time at end of matrix triangularization CP= 224.64.

SUBSPACE SIZE OF 12 VECTORS USED FOR CALCULATION OF FIRST 8 EIGENVECTORS.
MAXIMUM ITERATIONS = 100
NUMBER OF EQUATIONS = 37495
MAXIMUM WAVEFRONT = 1397
ITERATIONS PER SHIFT = 5
MAXIMUM MODES STORED = 12
MAXIMUM EIGENVALUE = 0.10000E+07
WORK SPACE (MBYTE) = 8.0875

Equation solver maximum pivot= 1.43581346E+12 at node 8454 UX.

Equation solver minimum pivot= 1939679.15 at node 7457 UY.

***** ITERATION 1 COMPLETE ***** CP= 2767.240 WALL= 9.5450

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	27.781951	0.00000000E+00	0.10000E+01
2	34.602620	0.00000000E+00	0.10000E+01
3	37.485198	0.00000000E+00	0.10000E+01
4	45.708942	0.00000000E+00	0.10000E+01
5	55.508660	0.00000000E+00	0.10000E+01
6	59.472038	0.00000000E+00	0.10000E+01
7	64.310192	0.00000000E+00	0.10000E+01
8	74.980213	0.00000000E+00	0.10000E+01
9	80.630641	0.00000000E+00	0.10000E+01
10	86.173345	0.00000000E+00	0.10000E+01
11	94.172193	0.00000000E+00	0.10000E+01
12	103.06913	0.00000000E+00	0.10000E+01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 1
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2386.820
CP TIME SINCE LAST SHIFT= 151.850

***** ITERATION 2 COMPLETE ***** CP= 2919.560 WALL= 9.6450

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.969329	27.781951	0.59916E+00
2	25.595279	34.602620	0.82767E+00
3	29.274310	37.485198	0.63963E+00
4	33.543745	45.708942	0.85686E+00
5	36.152951	55.508660	0.13574E+01
6	40.637775	59.472038	0.11417E+01
7	50.144555	64.310192	0.64480E+00
8	50.858842	74.980213	0.11735E+01
9	57.139021	80.630641	0.99129E+00
10	62.855802	86.173345	0.87956E+00
11	69.480325	94.172193	0.83705E+00
12	74.431053	103.06913	0.91756E+00

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2386.820
CP TIME SINCE LAST SHIFT= 304.170

***** ITERATION 3 COMPLETE ***** CP= 3071.400 WALL= 9.7456

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.941592	21.969329	0.25299E-02
2	24.646024	25.595279	0.78515E-01
3	29.013088	29.274310	0.18088E-01
4	33.276674	33.543745	0.16116E-01
5	35.948015	36.152951	0.11434E-01
6	38.914408	40.637775	0.90533E-01
7	49.154854	50.144555	0.40674E-01
8	49.717439	50.858842	0.46443E-01
9	55.704624	57.139021	0.52163E-01
10	60.728459	62.855802	0.71288E-01
11	65.071475	69.480325	0.14010E+00
12	70.760644	74.431053	0.10643E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2386.820
CP TIME SINCE LAST SHIFT= 456.010

***** ITERATION 4 COMPLETE ***** CP= 3223.250 WALL= 9.8458

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	21.941440	21.941592	0.13801E-04
2	24.639193	24.646024	0.55454E-03
3	29.004736	29.013088	0.57601E-03
4	33.263844	33.276674	0.77158E-03
5	35.939049	35.948015	0.49901E-03
6	38.797899	38.914408	0.60150E-02
7	48.955701	49.154854	0.81526E-02
8	49.611387	49.717439	0.42799E-02
9	55.495568	55.704624	0.75483E-02
10	59.846457	60.728459	0.29693E-01
11	63.068724	65.071475	0.64518E-01
12	68.884876	70.760644	0.55202E-01

```
ITERATIONS SINCE LAST SHIFT=      4
TOTAL NUMBER OF ITERATIONS=       4
NUMBER OF MODES CONVERGED=        0
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=          -1.0000
CP TIME FOR TRIANGULARIZATION=  2386.820
CP TIME SINCE LAST SHIFT=        607.860


    *****  ITERATION    5  COMPLETE *****  CP=     3375.760  WALL=       9.9464

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   1     21.941439          21.941440          0.12443E-06
   2     24.639108          24.639193          0.69185E-05
   3     29.004439          29.004736          0.20467E-04
   4     33.263120          33.263844          0.43529E-04
   5     35.938581          35.939049          0.26058E-04
   6     38.786943          38.797899          0.56500E-03
   7     48.904020          48.955701          0.21147E-02
   8     49.597600          49.611387          0.55606E-03
   9     55.442486          55.495568          0.19158E-02
  10     58.673552          59.846457          0.40380E-01
  11     62.036187          63.068724          0.33565E-01
  12     67.316148          68.884876          0.47151E-01

ITERATIONS SINCE LAST SHIFT=      5
TOTAL NUMBER OF ITERATIONS=       5
NUMBER OF MODES CONVERGED=        2
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=          -1.0000
CP TIME FOR TRIANGULARIZATION=  2386.820
CP TIME SINCE LAST SHIFT=        760.380

*** NOTE ***                          CP=     3375.770   TIME= 09:56:47
NEW SHIFT= 28.8018904.

*** NOTE ***                          CP=     5790.410   TIME= 10:41:45
STURM number= 2 should be 2.


    *****  ITERATION    6  COMPLETE *****  CP=     5924.410  WALL=      10.7922

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
       1  21.9414388            2  24.6391077

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   3     29.004427          29.004439          0.82917E-06
   4     33.263070          33.263120          0.29781E-05
   5     35.938549          35.938581          0.18058E-05
   6     38.785596          38.786943          0.69489E-04
   7     48.885947          48.904020          0.73950E-03
   8     49.595102          49.597600          0.10073E-03
   9     55.381592          55.442486          0.22003E-02
  10     56.842464          58.673552          0.65464E-01
  11     61.484229          62.036187          0.18035E-01
  12     65.497923          67.316148          0.56291E-01

ITERATIONS SINCE LAST SHIFT=      1
TOTAL NUMBER OF ITERATIONS=       6
NUMBER OF MODES CONVERGED=        5
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=          28.802
CP TIME FOR TRIANGULARIZATION=  2414.990
CP TIME SINCE LAST SHIFT=        133.650
```

***** ITERATION 7 COMPLETE ***** CP= 6040.010 WALL= 10.8811

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9414388	2	24.6391077	3	29.0044270
4	33.2630704	5	35.9385485		

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
6	38.785545	38.785596	0.26002E-05
7	48.882135	48.885947	0.15599E-03
8	49.594762	49.595102	0.13703E-04
9	55.018086	55.381592	0.13258E-01
10	55.694732	56.842464	0.41640E-01
11	61.237526	61.484229	0.80735E-02
12	63.948998	65.497923	0.49029E-01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 7
NUMBER OF MODES CONVERGED= 6
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 28.802
CP TIME FOR TRIANGULARIZATION= 2414.990
CP TIME SINCE LAST SHIFT= 249.260

***** ITERATION 8 COMPLETE ***** CP= 6149.800 WALL= 10.9678

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9414388	2	24.6391077	3	29.0044270
4	33.2630704	5	35.9385485	6	38.7855455

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
7	48.881346	48.882135	0.32265E-04
8	49.594694	49.594762	0.27685E-05
9	54.271209	55.018086	0.27713E-01
10	55.535176	55.694732	0.57544E-02
11	61.093333	61.237526	0.47260E-02
12	62.838015	63.948998	0.35673E-01

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 8
NUMBER OF MODES CONVERGED= 6
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 28.802
CP TIME FOR TRIANGULARIZATION= 2414.990
CP TIME SINCE LAST SHIFT= 359.040

***** ITERATION 9 COMPLETE ***** CP= 6259.940 WALL= 11.0547

****** PREVIOUS CONVERGED EIGENVALUES *****

1	21.9414388	2	24.6391077	3	29.0044270
4	33.2630704	5	35.9385485	6	38.7855455

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
7	48.881189	48.881346	0.64246E-05
8	49.594676	49.594694	0.71542E-06

*** NOTE *** CP= 6259.950 TIME= 11:03:17
NEW SHIFT= 50.0358483.

*** NOTE *** CP= 8649.250 TIME= 11:45:37
STURM number= 8 should be 8.
1

```
***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   11:45:40  APR 11, 1996 CP=   8649.560
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


 ***** FREQUENCIES FROM SUBSPACE ITERATION *****

 MODE    FREQUENCY (HERTZ)


   1       21.941439
   2       24.639108
   3       29.004427
   4       33.263070
   5       35.938549
   6       38.785545
   7       48.881189
   8       49.594676


  *** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37495
 R.M.S. WAVEFRONT SIZE =   902.2


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
      44.625 MB WRITTEN ON ELEMENT MATRIX FILE: adjust.emat
      29.703 MB WRITTEN ON ELEMENT SAVED DATA FILE: adjust.esav
      21.094 MB WRITTEN ON ASSEMBLED MATRIX FILE: adjust.full
       2.719 MB WRITTEN ON MODAL MATRIX FILE: adjust.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =      8656.200



 *****  ANSYS SOLUTION ROUTINE  *****


 PERFORM AN EXPANSION PASS


 NUMBER OF MODES TO EXPAND=     8
  CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

 *****  ANSYS SOLVE    COMMAND  *****
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   11:45:54  APR 11, 1996 CP=   8656.210
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill

                    S O L U T I O N   O P T I O N S

   PROBLEM DIMENSIONALITY. . . . . .3-D
   DEGREES OF FREEDOM. . . . . UX   UY   UZ
   ANALYSIS TYPE . . . . . .MODAL
      EXTRACTION METHOD. . . . . .SUBSPACE
      EXPANSION PASS . . . . . .ON
   NUMBER OF MODES TO EXPAND . . . . . 8
   ELEMENT RESULTS CALCULATION . . . . . .ON
```

L O A D S T E P C P T I O N S

LOAD STEP NUMBER. 1
PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
DATABASE OUTPUT CONTROLS
ITEM FREQUENCY COMPONENT
ALL ALL

*** NOTE *** CP= 8682.710 TIME= 11:46:54
Page file used.

*** ELEMENT RESULT CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	8.480	0.003
3	1560	SOLID45	5.400	0.003
4	600	SOLID45	2.070	0.003
5	2872	SOLID45	10.070	0.004
6	1064	SOLID45	3.580	0.003

*** NODAL LOAD CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	0.950	0.000
3	1560	SOLID45	0.520	0.000
4	600	SOLID45	0.140	0.000
5	2872	SOLID45	1.060	0.000
6	1064	SOLID45	0.450	0.000

*** ANSYS BINARY FILE STATISTICS
BUFFER SIZE USED= 4096
106.109 MB WRITTEN ON RESULTS FILE: adjust.rst

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 8931.160

***** ANSYS SOLUTION ROUTINE *****

PERFORM A SPECTRUM ANALYSIS
THIS WILL BE A NEW ANALYSIS

*** NOTE *** CP= 8931.160 TIME= 11:56:40
Some analysis options have been reset to their defaults. Please verify
current settings or respecify as required.

USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
USE ALL MODES FROM THE MODAL ANALYSIS
INCLUDE STRESS RESPONSES IN THE CALCULATIONS

SEISMIC EXCITATION DIRECTION = 0.00000E+00 1.0000 0.00000E+00

SPECTRUM TYPE KEY= 2 FACTOR= 1.00000

FREQ= 0.100 100. 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
NUMBER OF FREQUENCIES IN TABLE = 2

DAMPING= 0.00000E+00 SV= 16.285 16.285 0.00000E+00
0.00000E+00 0.00000E+00 0.00000E+00
0.00000E+00 0.00000E+00 0.00000E+00

COMBINE MODES USING THE SRSS METHOD

```
 WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF       1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= adjust.db
 FOR POSSIBLE RESUME FROM THIS POINT

***** ANSYS SOLVE    COMMAND  *****
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   11:57:10  APR 11, 1996 CP=   8944.320
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .SPECTRUM
     SPECTRUM TYPE. . . . . .SINGLE POINT
  NUMBER OF MODES TO BE USED. . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1
  SPECTRUM LOADING TYPE . . . . . .ACCELERATION
  EXCITATION DIRECTION. . . . . 0.00000E+00  1.0000     0.00000E+00
  MODE COMBINATION TYPE . . . . . .SRSS
     SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY    COMPONENT
      ALL         ALL

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   11:57:21  APR 11, 1996 CP=   8948.120
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


   SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07


     SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

MODE      FREQUENCY     DAMPING       SV          MODE COEF.

   1        21.94          0.0000  16.285          0.3139E-02
   2        24.64          0.0000  16.285         -0.3196E-03
   3        29.00          0.0000  16.285          0.1402E-02
   4        33.26          0.0000  16.285          0.1669E-01
   5        35.94          0.0000  16.285         -0.1181E-03
   6        38.79          0.0000  16.285         -0.3109E-03
   7        48.88          0.0000  16.285          0.2147E-03
   8        49.59          0.0000  16.285          0.5272E-04

                 MODAL COMBINATION COEFFICIENTS

          MODE=   1  FREQUENCY=      21.941  COUPLING COEF.=   1.000
          MODE=   2  FREQUENCY=      24.639  COUPLING COEF.=   1.000
          MODE=   3  FREQUENCY=      29.004  COUPLING COEF.=   1.000
          MODE=   4  FREQUENCY=      33.263  COUPLING COEF.=   1.000
```

```
         MODE=   5  FREQUENCY=      35.939  COUPLING COEF.=   1.000
         MODE=   6  FREQUENCY=      38.736  COUPLING COEF.=   1.000
         MODE=   7  FREQUENCY=      48.831  COUPLING COEF.=   1.000
         MODE=   8  FREQUENCY=      49.595  COUPLING COEF.=   1.000

 SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE adjust.mcom


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37495
  R.M.S. WAVEFRONT SIZE =   902.2


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =      8948.130


 PURGE ALL SOLUTION AND POST DATA
 SAVE ALL MODEL DATA

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= adjust.db
  FOR POSSIBLE RESUME FROM THIS POINT


 NUMBER OF WARNING MESSAGES ENCOUNTERED=       1015
 NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

 ***  PAGE FILE USED  ***
 NUMBER OF R/W OPERATIONS=          788
 MAXIMUM RECORD NUMBER   =          599
 RECORD SIZE (I*4 WORDS) =        16384
 PAGE FILE SIZE (MB)     =       37.438

*------------------------------------------------------------------------------*
|                                                                              |
|                           ANSYS RUN COMPLETED                                |
|                                                                              |
|------------------------------------------------------------------------------|
|                                                                              |
|              REV. 5.1   24                      HP 9000/7XX                  |
|                                                                              |
|       CP TIME      (sec) =      8957.240        TIME  =  11:57:38            |
|       ELAPSED TIME (sec) =     11768.000        DATE  =  04/11/96            |
|                                                                              |
*------------------------------------------------------------------------------*
```

Outer Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 16:51:58 APR 20, 1996 CP= 169.660
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 13477 OUTSIDE NODE = 8071

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.5968E+06	0.1869E+07	0.8402E+06	0.1331E+07	0.4398E+06	0.2262E+06
S1	**S2**	**S3**	**SINT**	**SEQV**	
0.2830E+07	0.7200E+06	-0.2441E+06	0.3074E+07	0.2724E+07	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.5442E+06	0.4520E+06	0.7610E+06	0.1121E+07	-0.1812E+06	-0.5468E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.5442E+06	-0.4520E+06	-0.7610E+06	-0.1121E+07	0.1812E+06	0.5468E+05
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.1651E+07	0.7366E+06	-0.6306E+06	0.2282E+07	0.1989E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.6306E+06	-0.7366E+06	-0.1651E+07	0.2282E+07	0.1989E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1141E+07	0.2321E+07	0.1601E+07	0.2452E+07	0.2586E+06	0.1715E+06
C	0.5968E+06	0.1869E+07	0.8402E+06	0.1331E+07	0.4398E+06	0.2262E+06
O	0.5266E+05	0.1417E+07	0.7916E+05	0.2096E+06	0.6210E+06	0.2809E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.4289E+07	0.1566E+07	-0.7916E+06	0.5081E+07	0.4404E+07	
C	0.2830E+07	0.7200E+06	-0.2441E+06	0.3074E+07	0.2724E+07	
O	0.1715E+07	0.1168E+06	-0.2826E+06	0.1998E+07	0.1831E+07	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.6206E+06	0.2732E+05	0.2812E+06	0.1197E+06	-0.4223E+05	0.3413E+05
C	-0.2805E+06	0.1084E+06	-0.1382E+06	-0.5876E+05	0.1845E+05	-0.2783E+05
O	0.4895E+06	-0.3333E+06	0.4112E+06	0.1031E+06	-0.3665E+05	0.7536E+05
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.6456E+06	0.2875E+06	-4026.	0.6496E+06	0.5636E+06	
C	0.1190E+06	-0.1362E+06	-0.2932E+06	0.4122E+06	0.3603E+06	
O	0.5410E+06	0.3752E+06	-0.3488E+06	0.8898E+06	0.8196E+06	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1762E+07	0.2349E+07	0.1882E+07	0.2572E+07	0.2164E+06	0.2056E+06
C	0.3163E+06	0.1978E+07	0.7019E+06	0.1272E+07	0.4582E+06	0.1984E+06
O	0.5421E+06	0.1084E+07	0.4904E+06	0.3127E+06	0.5843E+06	0.3562E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	**TEMP**
I	0.4676E+07	0.1851E+07	-0.5338E+06	0.5210E+07	0.4517E+07	0.0000E+00
C	0.2785E+07	0.5850E+06	-0.3743E+06	0.3160E+07	0.2806E+07	
O	0.1633E+07	0.4129E+06	0.7084E+05	0.1562E+07	0.1422E+07	0.0000E+00

Inner Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 16:52:00 APR 20, 1996 CP= 171.370
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 7253 OUTSIDE NODE = 8005

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.5517E+06	0.1645E+07	0.5653E+06	0.1162E+07	0.5252E+06	0.1553E+06
S1	**S2**	**S3**	**SINT**	**SEQV**	
0.2524E+07	0.4564E+06	-0.2188E+06	0.2743E+07	0.2476E+07	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.4007E+06	0.1386E+07	0.3151E+06	0.1612E+06	0.6341E+05	0.4518E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.4007E+06	-0.1386E+07	-0.3151E+06	-0.1612E+06	-0.6341E+05	-0.4518E+05
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.1417E+07	0.3901E+06	0.2956E+06	0.1121E+07	0.1077E+07	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	-0.2956E+06	-0.3901E+06	-0.1417E+07	0.1121E+07	0.1077E+07	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.9524E+06	0.3032E+07	0.8804E+06	0.1323E+07	0.5886E+06	0.2004E+06
C	0.5517E+06	0.1645E+07	0.5653E+06	0.1162E+07	0.5252E+06	0.1553E+06
O	0.1510E+06	0.2586E+06	0.2501E+06	0.1000E+07	0.4618E+06	0.1101E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.3805E+07	0.7627E+06	0.2970E+06	0.3508E+07	0.3300E+07	
C	0.2524E+07	0.4564E+06	-0.2188E+06	0.2743E+07	0.2476E+07	
O	0.1362E+07	0.1500E+06	-0.8525E+06	0.2215E+07	0.1921E+07	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.6228E+05	0.4738E+06	0.1016E+06	-0.4964E+05	0.6014E+05	0.2317E+05
C	-0.6211E+05	-0.4732E+06	-0.1014E+06	0.4971E+05	-0.6011E+05	-0.2315E+05
O	0.6194E+05	0.4726E+06	0.1013E+06	-0.4978E+05	0.6008E+05	0.2313E+05
	S1	**S2**	**S3**	**SINT**	**SEQV**	
I	0.4882E+06	0.1098E+06	0.3974E+05	0.4484E+06	0.4178E+06	
C	-0.3956E+05	-0.1096E+06	-0.4876E+06	0.4480E+06	0.4174E+06	
O	0.4870E+06	0.1095E+06	0.3938E+05	0.4476E+06	0.4170E+06	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1015E+07	0.3505E+07	0.9819E+06	0.1273E+07	0.6487E+06	0.2236E+06
C	0.4896E+06	0.1172E+07	0.4638E+06	0.1211E+07	0.4651E+06	0.1321E+06
O	0.2129E+06	0.7312E+06	0.3515E+06	0.9507E+06	0.5218E+06	0.1332E+06
	S1	**S2**	**S3**	**SINT**	**SEQV**	**TEMP**
I	0.4187E+07	0.8412E+06	0.4736E+06	0.3714E+07	0.3544E+07	0.0000E+00
C	0.2206E+07	0.3828E+06	-0.4640E+06	0.2670E+07	0.2364E+07	
O	0.1650E+07	0.2149E+06	-0.5690E+06	0.2219E+07	0.1949E+07	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 16:52:02 APR 20, 1996 CP= 172.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 7289 OUTSIDE NODE = 2457

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

	SX	SY	SZ	SXY	SYZ	SXZ
	0.5482E+06	0.5450E+07	0.6798E+06	0.2638E+06	0.1106E+07	0.1927E+06
	S1	S2	S3	SINT	SEQV	
	0.5711E+07	0.6229E+06	0.3439E+06	0.5367E+07	0.5233E+07	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1500E+06	0.6222E+06	0.1855E+06	-0.9108E+05	-0.1959E+05	-9968.
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1500E+06	-0.6222E+06	-0.1855E+06	0.9108E+05	0.1959E+05	9968.
	S1	S2	S3	SINT	SEQV	
I	0.6335E+06	0.1852E+06	-0.1610E+06	0.7946E+06	0.6900E+06	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1610E+06	-0.1852E+06	-0.6335E+06	0.7946E+06	0.6900E+06	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.3982E+06	0.6072E+07	0.8653E+06	0.1728E+06	0.1086E+07	0.1828E+06
C	0.5482E+06	0.5450E+07	0.6798E+06	0.2638E+06	0.1106E+07	0.1927E+06
O	0.6982E+06	0.4828E+07	0.4943E+06	0.3549E+06	0.1125E+07	0.2027E+06
	S1	S2	S3	SINT	SEQV	
I	0.6297E+07	0.7133E+06	0.3256E+06	0.5971E+07	0.5787E+07	
C	0.5711E+07	0.6229E+06	0.3439E+06	0.5367E+07	0.5233E+07	
O	0.5137E+07	0.6902E+06	0.1927E+06	0.4944E+07	0.4715E+07	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-65.13	270.2	80.55	-39.55	-8.507	-4.328
C	-0.3492E-09	0.7451E-08	0.1863E-08	-0.7567E-09	-0.2328E-09	-0.1455E-09
O	65.13	-270.2	-80.55	39.55	8.507	4.328
	S1	S2	S3	SINT	SEQV	
I	275.1	80.41	-69.92	345.0	299.6	
C	0.7532E-08	0.1866E-08	-0.4342E-09	0.7966E-08	0.7101E-08	
O	69.92	-80.41	-275.1	345.0	299.6	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.3981E+06	0.6072E+07	0.8654E+06	0.1727E+06	0.1086E+07	0.1828E+06
C	0.5482E+06	0.5450E+07	0.6798E+06	0.2638E+06	0.1106E+07	0.1927E+06
O	0.6982E+06	0.4827E+07	0.4943E+06	0.3550E+06	0.1125E+07	0.2027E+06
	S1	S2	S3	SINT	SEQV	TEMP
I	0.6297E+07	0.7134E+06	0.3256E+06	0.5971E+07	0.5787E+07	0.0000E+00
C	0.5711E+07	0.6229E+06	0.3439E+06	0.5367E+07	0.5233E+07	
O	0.5137E+07	0.6902E+06	0.1927E+06	0.4944E+07	0.4715E+07	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 16:52:04 APR 20, 1996 CP= 174.520
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 2969 OUTSIDE NODE = 5093

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.1225E+06	0.2873E+07	0.4467E+06	0.5487E+05	0.5565E+06	0.4530E+05
S1	S2	S3	SINT	SEQV	
0.2996E+07	0.3302E+06	0.1161E+06	0.2880E+07	0.2779E+07	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1110E+05	1534.	3691.	-6560.	3166.	9595.
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1110E+05	-1534.	-3691.	6560.	-3166.	-9595.
	S1	S2	S3	SINT	SEQV	
I	8410.	4185.	-0.1847E+05	0.2688E+05	0.2504E+05	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1847E+05	-4185.	-8410.	0.2688E+05	0.2504E+05	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1114E+06	0.2875E+07	0.4504E+06	0.4831E+05	0.5597E+06	0.5489E+05
C	0.1225E+06	0.2873E+07	0.4467E+06	0.5487E+05	0.5565E+06	0.4530E+05
O	0.1336E+06	0.2872E+07	0.4430E+06	0.6143E+05	0.5533E+06	0.3570E+05
	S1	S2	S3	SINT	SEQV	
I	0.2999E+07	0.3357E+06	0.1019E+06	0.2897E+07	0.2788E+07	
C	0.2996E+07	0.3302E+06	0.1161E+06	0.2880E+07	0.2779E+07	
O	0.2993E+07	0.3254E+06	0.1295E+06	0.2864E+07	0.2771E+07	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-4.822	0.6662	1.603	-2.848	1.375	4.166
C	-0.2328E-09	-0.1397E-08	-0.5821E-10	-0.1673E-09	0.2328E-09	-0.4366E-10
O	4.822	-0.6662	-1.603	2.848	-1.375	-4.166
	S1	S2	S3	SINT	SEQV	
I	3.652	1.817	-8.022	11.67	10.87	
C	0.4036E-11	-0.2353E-09	-0.1457E-08	0.1461E-08	0.1357E-08	
O	8.022	-1.817	-3.652	11.67	10.87	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1114E+06	0.2875E+07	0.4504E+06	0.4830E+05	0.5597E+06	0.5490E+05
C	0.1225E+06	0.2873E+07	0.4467E+06	0.5487E+05	0.5565E+06	0.4530E+05
O	0.1336E+06	0.2872E+07	0.4430E+06	0.6143E+05	0.5533E+06	0.3570E+05
	S1	S2	S3	SINT	SEQV	TEMP
I	0.2999E+07	0.3357E+06	0.1019E+06	0.2897E+07	0.2788E+07	0.0000E+00
C	0.2996E+07	0.3302E+06	0.1161E+06	0.2880E+07	0.2779E+07	
O	0.2993E+07	0.3254E+06	0.1295E+06	0.2864E+07	0.2771E+07	0.0000E+00

```
*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
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AFTER YOU HAVE READ AND UNDERSTAND THE PREVIOUS DISCLAIMER,
PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = seism5
 MEMORY REQUESTED (MB)      =     72.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.180   TIME= 17:49:55
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism5    17:49:55  APR 19, 1996 CP=      0.180

    1 /com,*********************************************************************
    2 /com,*********************************************************************
    3 /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4 /com,*****  Degree of Degradation in Outer Barrier:  0%                    *****
    5 /com,*****  Degree of Degradation in Inner Barrier:  0%                    *****
    6 /com,*****  Degree of Degradation in Basket Assembly:  0%                  *****
    7 /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
    8 /com,*********************************************************************
    9 /com,*********************************************************************
   10 /config,nvpag,512
   11 /units,si
   12 /prep7
   13 /title, 21 PWR Tube Static Analysis With Backfill
   14 /vcon,,0
   15 /com, Define Parameters
   16 ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   17 obir=0.73095            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   18 obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   19 obor=0.83095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   20 ts1=.007                ! SS-B Plate Thickness
   21 ts2=.005                ! CS Tube Thickness
   22 ts3=.010                ! Corner Guide Thickness
   23 ts4=.010                ! End Guide Thickness
   24 egih=0.0809             ! End Guide Fin Inner Height
   25 pie=3.1415926           ! Pi
   26 ang1=30*pie/180         ! Angle on end of end guide
   27 ang2=80*pie/180         ! Angle on end of end guide fin
   28 ang3=58*pie/180         ! Angle on end of corner guide
   29 tw=0.2285               ! Tube Inner Side Width
   30 pos1=tw/2               ! Dimension to Keypoint Position 1
   31 pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   32 pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   33 pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   34 pos5=pos4+tw            ! Dimension to Keypoint Position 5
   35 pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   36 pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   37 pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   38 pos9=pos8+tw            ! Dimension to Keypoint Position 9
   39 pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   40 pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   41 posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   42 posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   43 poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   44 posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   45 posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   46 poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
   47 poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
   48 bkht=4.575              ! Basket Height
   49 ibht=4.585              ! inner barrier cavity height
   50 bgh=ibht-bkht           ! Basket Gap Height
```

```
iblt=0.025              ! inner lid height
elev1=ibht+iblt         ! Elevation of Top of Inner Barrier
ltlgh=0.030             ! Lid to Lid Gap Height
elev2=elev1+ltlgh       ! Elevation of Bottom of Upper Outer Barrier Lid
oblt=0.11               ! outer lid height
elev3=elev2+oblt        ! Elevation of Top of Upper Outer Barrier Lid
stht=0.225              ! skirt height
elev4=elev3+stht        ! Elevation of Top of Waste Package
elev5=-(iblt+oblt)      ! Elevation of Bottom of Lower Outer Barrier Lid
elev6=elev5-stht        ! Elevation of Bottom of Waste Package
/com, Line Divisions
shd=1             ! Skirt Height Divisions
obld=1            ! Outer Barrier Lid Divisions
gd=1              ! Gap Divisions
ibld=1            ! Inner Barrier Lid Divisions
bd=15             ! Basket Divisions
htwd=4            ! Half Tube Width Divisions
twd=4             ! Tube Width Divisions
thd=4             ! Tube Height Divisions
egfd=4            ! End Guide Fin Divisions
ptd=1             ! Plate Thickness Divisions
ttd=1             ! Tube Thickness Divisions
a1d=4             ! Arc 1 Divisions
a2d=4             ! Arc 2 Divisions
a3d=4             ! Arc 3 Divisions
a4d=4             ! Arc 4 Divisions
a5d=4             ! Arc 5 Divisions
a6d=4             ! Arc 6 Divisions
a7d=4             ! Arc 7 Divisions
a8d=4             ! Arc 8 Divisions
a9d=4             ! Arc 9 Divisions
ibtd=2            ! Inner Barrier Thickness Divisions
obitd=2           ! Outer Barrier Inner Thickness Divisions
std=2             ! Skirt Thickness Divisions
/com, Define Element Properties
et,1,solid45      ! Carbon Steel Tube
et,2,solid45      ! Stainless Steel - Boron Plate
et,3,solid45      ! Carbon Steel End Guide
et,4,solid45      ! Carbon Steel Corner Guide
et,5,solid45      ! Alloy 625 Inner Barrier
et,6,solid45      ! A 516 Carbon Steel Outer Barrier
et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
!et,7,contac49    ! Contact Between Basket and Inner Barrier
r,7,1.5e8,,,1.298,15  ! Real Constant Set for Contact, kn=1.5E8,
/com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
/com, Room Temperature Properties of Materials
mp,ex,1,206e9       ! A516 Carbon Steel Tube
mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
mp,ex,3,206e9       ! A516 Carbon Steel End Guide
mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
mp,ex,5,208e9       ! Alloy 625 Inner Barrier
mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
mp,nuxy,6,0.3       ! A516 Carbon Steel Outer Barrier
mp,nuxy,7,0.3       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,dens,1,44646.96      ! A516 Carbon Steel Tube (Adjusted density)
mp,dens,2,7953      ! 316B6A Stainless Steel - Boron Plate
mp,dens,3,8131      ! A516 Carbon Steel End Guide
mp,dens,4,8131      ! A516 Carbon Steel Corner Guide
mp,dens,5,8442      ! Alloy 625 Inner Barrier
mp,dens,6,8131      ! A516 Carbon Steel Outer Barrier
mp,dens,7,20670     ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
!mp,mu,7,0.57       ! Coefficient of Friction (Steel on Steel Assumed)
!tb,biso,1
!tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
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121 !tb,biso,2
122 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
123 !tb,biso,3
124 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
125 !tb,biso,4
126 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
127 !tb,biso,5
128 !tbdata,,379e6,1.271e9  ! Alloy 625
129 !tb,biso,6
130 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
131 !tb,biso,7
132 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
133 /com
134 /com, Define keypoints in the basket assembly
135 csys,0
136 k,1,0,0
137 k,2,pos1,0
138 k,3,pos2,0
139 k,4,pos3,0
140 k,5,pos4,0
141 k,6,pos5,0
142 k,7,pos6,0
143 k,8,pos7,0
144 k,9,pos8,0
145 k,10,pos9,0
146 k,11,pos10,0
147 k,12,pos11,0
148 k,13,pos1,pos1
149 k,14,pos4,pos1
150 k,15,pos5,pos1
151 k,16,pos8,pos1
152 k,17,pos9,pos1
153 k,18,pos2,pos2
154 k,19,pos3,pos2
155 k,20,pos6,pos2
156 k,21,pos7,pos2
157 k,22,pos10,pos2
158 k,23,pos11,posen
159 !k,24,posei,posen
160 csys,1
161 k,24,ibir,(180/pie)*atan(posen/posei)
162 csys,0
163 k,25,pos3,pos3
164 k,26,pos6,pos3
165 k,27,pos7,pos3
166 k,28,pos10,pos3
167 k,29,pos11,posef
168 !k,30,poseo,posef
169 csys,1
170 k,30,ibir,(180/pie)*atan(posef/poseo)
171 csys,0
172 k,31,pos4,pos4
173 k,32,pos5,pos4
174 k,33,pos8,pos4
175 k,34,pos9,pos4
176 k,35,pos5,pos5
177 k,36,pos8,pos5
178 k,37,pos9,pos5
179 !k,38,pos11,poseg
180 csys,1
181 k,38,ibir,(180/pie)*atan(poseg/pos11)
182 csys,0
183 k,39,pos6,pos6
184 k,40,pos7,pos6
185 !k,41,pos10,pos6
186 csys,1
187 k,41,ibir,(180/pie)*atan(pos6/pos10)
188 csys,0
189 k,42,posg,posg
190 !k,43,poscg,posg
```

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191 csys,1
192 k,43,ibir,(180/pie)*atan(posg/posog)
193 k,44,ibir,0
194 k,45,ibir,45
195 k,46,obir,0
196 k,47,obir,(180/pie)*atan(posen/posei)
197 k,48,obir,(180/pie)*atan(posef/poseo)
198 k,49,obir,(180/pie)*atan(poseg/pos11)
199 k,50,obir,(180/pie)*atan(pos6/pos10)
200 k,51,obir,(180/pie)*atan(posg/posog)
201 k,52,obir,45
202 k,53,obsr,0
203 k,54,obsr,(180/pie)*atan(posen/posei)
204 k,55,obsr,(180/pie)*atan(posef/poseo)
205 k,56,obsr,(180/pie)*atan(poseg/pos11)
206 k,57,obsr,(180/pie)*atan(pos6/pos10)
207 k,58,obsr,(180/pie)*atan(posg/posog)
208 k,59,obsr,45
209 k,60,obor,0
210 k,61,obor,(180/pie)*atan(posen/posei)
211 k,62,obor,(180/pie)*atan(posef/poseo)
212 k,63,obor,(180/pie)*atan(poseg/pos11)
213 k,64,obor,(180/pie)*atan(pos6/pos10)
214 k,65,obor,(180/pie)*atan(posg/posog)
215 k,66,obor,45
216 local,11,0,0,0,0,45,0,0,
217 ksymm,y,all,,,0,0,0
218 nummrg,kp
219 csys,0
220 ksymm,y,all,,,0,0,0
221 nummrg,kp
222 kdel,2,12,1
223 k,1001,0,0,bkht
224 l,1,1001              ! Line 1 for VDRAG of Basket
225 lesize,all,,,bd,1,0
226 k,2001,0,0,ibht
227 l,1001,2001           ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
228 lesize,all,,,gd,1,0
229 k,3001,0,0,elev1
230 l,2001,3001           ! Line 3 for VDRAG of Inner Barrier Upper Lid
231 lesize,all,,,ibld,1,0
232 k,4001,0,0,elev2
233 l,3001,4001           ! Line 4 for VDRAG of Lid to Lid Gap
234 lesize,all,,,gd,1,0
235 k,5001,0,0,elev3
236 l,4001,5001           ! Line 5 for VDRAG of Outer Barrier Upper Lid
237 lesize,all,,,obld,1,0
238 k,6001,0,0,elev4
239 l,5001,6001           ! Line 6 for VDRAG of Upper Skirt
240 lesize,all,,,shd,1,0
241 k,7001,0,0,-iblt
242 l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
243 lesize,all,,,ibld,1,0
244 k,8001,0,0,elev5
245 l,7001,8001           ! Line 8 for VDRAG of OB Lower Lid
246 lesize,all,,,obld,1,0
247 k,9001,0,0,elev6
248 l,8001,9001           ! Line 9 for VDRAG of Lower Skirt
249 lesize,all,,,shd,1,0
250 /com, line set 1 Tube Width for Half Tubes on Symmetry Plane
251 L,     197,     206
252 L,     196,     205
253 L,     195,     201
254 L,     194,     200
255 L,     193,     204
256 L,     192,     203
257 L,     191,     199
258 L,     190,     198
259 L,     189,     202
260 L,     188,     138
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261  L,     187,     133
262  L,      68,      13
263  L,      69,      18
264  L,      70,      85
265  L,      71,      80
266  L,      72,      81
267  L,      73,      86
268  L,      74,      87
269  L,      75,      82
270  L,      76,      83
271  L,      77,      88
272  L,      78,      89
273  lesize,all,,,htwd,1,0
274  /com, line set 2 Tube Widths
275  L,     211,     218
276  L,     210,     220
277  L,     215,     217
278  L,     214,     216
279  L,     209,     219
280  L,     208,     159
281  L,     213,     155
282  L,     151,     152
283  L,     145,     146
284  L,     139,     140
285  L,     134,     135
286  L,      14,      15
287  L,      19,      20
288  L,      25,      26
289  L,      31,      32
290  L,      98,      35
291  L,      92,      39
292  L,      93,     106
293  L,      99,     102
294  L,     100,     103
295  L,      94,     107
296  L,      95,     104
297  lesize,all,,,twd,1,0
298  /com, line set 3 Tube Widths on End Column
299  L,     162,     163
300  L,     160,     161
301  L,     156,     157
302  L,     153,     154
303  L,     147,     148
304  L,     141,     142
305  L,     136,     137
306  L,      16,      17
307  L,      21,      22
308  L,      27,      28
309  L,      33,      34
310  L,      36,      37
311  L,      40,      41
312  L,      42,      43
313  lesize,all,,,twd,1,0
314  /com, line set 4 Tube Heights
315  L,     201,     200
316  L,     205,     204
317  L,     210,     209
318  L,     215,     214
319  L,     217,     216
320  L,     220,     219
321  L,     221,     162
322  L,     199,     198
323  L,     203,     202
324  L,     208,     145
325  L,     213,     151
326  L,     155,     152
327  L,     159,     146
328  L,     160,     147
329  L,     156,     153
330  L,     157,     154
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331  L,     161,     148
332  L,     133,      13
333  L,     138,      18
334  L,     139,      19
335  L,     134,      14
336  L,     135,      15
337  L,     140,      20
338  L,     141,      21
339  L,     136,      16
340  L,     137,      17
341  L,     142,      22
342  L,     143,      23
343  L,      80,      81
344  L,      85,      86
345  L,      25,      92
346  L,      31,      98
347  L,      32,      35
348  L,      26,      39
349  L,      27,      40
350  L,      33,      36
351  L,      34,      37
352  L,      28,      41
353  L,      29,      38
354  L,      82,      83
355  L,      87,      88
356  L,      93,      94
357  L,      99,     100
358  L,     102,     103
359  L,     106,     107
360  L,      42,     109
361  L,     158,     149
362  lesize,all,,,thd,1,0
363  /com, line set 5 End Guide Fins
364  L,     207,     206
365  L,     212,     211
366  L,     150,     149
367  L,     144,     143
368  L,      24,      23
369  L,      30,      29
370  L,      96,      95
371  L,      90,      89
372  lesize,all,,,egfd,1,0
373  /com, line set 6 SS-B Plate Thickness
374  L,     197,     196
375  L,     206,     205
376  L,     211,     210
377  L,     207,     212
378  L,     206,     211
379  L,     205,     210
380  L,     218,     220
381  L,     220,     221
382  L,     193,     192
383  L,     204,     203
384  L,     209,     208
385  L,     204,     209
386  L,     203,     208
387  L,     219,     159
388  L,     162,     160
389  L,     163,     161
390  L,     161,     158
391  L,     219,     162
392  L,     159,     160
393  L,     189,     188
394  L,     202,     138
395  L,     145,     139
396  L,     202,     145
397  L,     138,     139
398  L,     146,     140
399  L,     147,     141
400  L,     146,     147
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401  L,     140,     141
402  L,     148,     142
403  L,     149,     143
404  L,     148,     149
405  L,     142,     143
406  L,     150,     144
407  L,      69,      70
408  L,      18,      85
409  L,      19,      25
410  L,      18,      19
411  L,      85,      25
412  L,      20,      26
413  L,      21,      27
414  L,      20,      21
415  L,      26,      27
416  L,      22,      28
417  L,      22,      23
418  L,      28,      29
419  L,      23,      29
420  L,      24,      30
421  L,      73,      74
422  L,      86,      87
423  L,      92,      93
424  L,      86,      92
425  L,      87,      93
426  L,      39,     106
427  L,      40,      42
428  L,      39,      40
429  L,     106,      42
430  L,      38,      41
431  L,      41,      43
432  L,      77,      78
433  L,      88,      89
434  L,      94,      95
435  L,      88,      94
436  L,      89,      95
437  L,      90,      96
438  L,     109,     107
439  L,     107,     104
440  L,     224,     225
441  L,     230,     231
442  L,     236,     237
443  L,     226,     227
444  L,     227,     228
445  L,     232,     233
446  L,     233,     234
447  L,     238,     239
448  L,     239,     240
449  L,     171,     170
450  L,     170,     169
451  L,     178,     177
452  L,     177,     176
453  L,     185,     184
454  L,     184,     183
455  L,     168,     167
456  L,     175,     174
457  L,     182,     181
458  L,      47,      48
459  L,      54,      55
460  L,      61,      62
461  L,      49,      50
462  L,      50,      51
463  L,      56,      57
464  L,      57,      58
465  L,      63,      64
466  L,      64,      65
467  L,     117,     116
468  L,     116,     115
469  L,     124,     123
470  L,     123,     122
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471  L,      131,      130
472  L,      130,      129
473  L,      114,      113
474  L,      121,      120
475  L,      128,      127
476  lesize,all,,,ptd,1,0
477  /com, line set 7 tube thickness
478  L,      196,      195
479  L,      205,      201
480  L,      204,      200
481  L,      193,      194
482  L,      210,      215
483  L,      220,      217
484  L,      219,      216
485  L,      209,      214
486  L,      192,      191
487  L,      203,      199
488  L,      202,      198
489  L,      189,      190
490  L,      208,      213
491  L,      159,      155
492  L,      146,      152
493  L,      145,      151
494  L,      160,      156
495  L,      161,      157
496  L,      148,      154
497  L,      147,      153
498  L,      188,      187
499  L,      138,      133
500  L,       18,       13
501  L,       69,       68
502  L,      139,      134
503  L,      140,      135
504  L,       20,       15
505  L,       19,       14
506  L,      141,      136
507  L,      142,      137
508  L,       22,       17
509  L,       21,       16
510  L,       70,       71
511  L,       85,       80
512  L,       86,       81
513  L,       73,       72
514  L,       25,       31
515  L,       26,       32
516  L,       39,       35
517  L,       92,       98
518  L,       27,       33
519  L,       28,       34
520  L,       41,       37
521  L,       40,       36
522  L,       74,       75
523  L,       87,       82
524  L,       88,       83
525  L,       77,       76
526  L,       93,       99
527  L,      106,      102
528  L,      107,      103
529  L,       94,      100
530  lesize,all,,,ttd,1,0
531  csys,1
532  /com, line set 8, arc 1 bottom
533  L,      222,      207
534  L,      223,      224
535  L,      229,      230
536  L,      235,      236
537  lesize,all,,,a1d,1,0
538  /com, line set 9, arc 2 side arcs
539  L,      212,      218
540  L,      225,      226
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L,     231,     232
L,     237,     238
lesize,all,,,a2d,1,0
/com, line set 10, arc 3 side arcs
L,     221,     163
L,     228,     171
L,     234,     178
L,     240,     185
lesize,all,,,a3d,1,0
/com, line set 11, arc 4 side arcs
L,     158,     150
L,     169,     168
L,     176,     175
L,     183,     182
lesize,all,,,a4d,1,0
/com, line set 12, arc 5 side arcs
L,     144,      24
L,     167,      47
L,     174,      54
L,     181,      61
lesize,all,,,a5d,1,0
/com, line set 13, arc 6 side arcs
L,      30,      38
L,      48,      49
L,      55,      56
L,      62,      63
lesize,all,,,a6d,1,0
/com, line set 14, arc 7 side arcs
L,      43,     109
L,      51,     117
L,      58,     124
L,      65,     131
lesize,all,,,a7d,1,0
/com, line set 15, arc 8 side arcs
L,     104,      96
L,     115,     114
L,     122,     121
L,     129,     128
lesize,all,,,a8d,1,0
/com, line set 16, arc 9 top arcs
L,      90,     110
L,     113,     112
L,     120,     119
L,     127,     126
lesize,all,,,a9d,1,0
csys,0
/com, line set 17 IB thickness
L,     222,     223
L,     207,     224
L,     212,     225
L,     218,     226
L,     220,     227
L,     221,     228
L,     163,     171
L,     161,     170
L,     158,     169
L,     150,     168
L,     144,     167
L,      24,      47
L,      30,      48
L,      38,      49
L,      41,      50
L,      43,      51
L,     109,     117
L,     107,     116
L,     104,     115
L,      96,     114
L,      90,     113
L,     110,     112
lesize,all,,,ibtd,1,0
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/com, line set 18 OB inner thickness
L,      223,     229
L,      224,     230
L,      225,     231
L,      226,     232
L,      227,     233
L,      228,     234
L,      171,     178
L,      170,     177
L,      169,     176
L,      168,     175
L,      167,     174
L,       47,      54
L,       48,      55
L,       49,      56
L,       50,      57
L,       51,      58
L,      117,     124
L,      116,     123
L,      115,     122
L,      114,     121
L,      113,     120
L,      112,     119
lesize,all,,,obitd,1,0
/com, line set 19 skirt thickness
L,      229,     235
L,      230,     236
L,      231,     237
L,      232,     238
L,      233,     239
L,      234,     240
L,      178,     185
L,      177,     184
L,      176,     183
L,      175,     182
L,      174,     181
L,       54,      61
L,       55,      62
L,       56,      63
L,       57,      64
L,       58,      65
L,      124,     131
L,      123,     130
L,      122,     129
L,      121,     128
L,      120,     127
L,      119,     126
lesize,all,,,std,1,0
/com, area set 1, tubes
a,195,196,205,201
a,200,201,205,204
a,193,194,200,204
a,191,192,203,199
a,198,199,203,202
a,189,190,198,202
a,187,188,138,133
a,133,138,18,13
a,69,68,13,18
a,71,70,85,80
a,80,85,86,81
a,73,72,81,86
a,75,74,87,82
a,82,87,88,83
a,77,76,83,88
a,209,210,215,214
a,215,210,220,217
a,216,217,220,219
a,209,214,216,219
a,145,208,213,151
a,213,208,159,155
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a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
a,159,219,162,160
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a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
a,223,229,230,224
a,224,230,231,225
a,225,231,232,226
a,226,232,233,227
a,227,233,234,228
a,228,234,178,171
a,171,178,177,170
a,170,177,176,169
a,169,176,175,168
a,168,175,174,167
a,167,174,54,47
a,47,54,55,48
a,48,55,56,49
a,49,56,57,50
a,50,57,58,51
a,51,58,124,117
a,117,124,123,116
a,116,123,122,115
a,115,122,121,114
a,114,121,120,113
a,113,120,119,112
a,229,235,236,230
a,236,237,231,230
a,231,237,238,232
a,238,239,233,232
a,239,240,234,233
a,240,185,178,234
a,185,184,177,178
a,184,183,176,177
a,176,183,182,175
a,175,182,181,174
a,174,181,61,54
a,54,61,62,55
a,55,62,63,56
a,56,63,64,57
a,57,64,65,58
a,58,65,131,124
a,124,131,130,123
a,123,130,129,122
a,122,129,128,121
a,121,128,127,120
a,120,127,126,119
```

```
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
asel,s,loc,z,ibht+0.02
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.02
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,bgh
nummrg,kp
/com, lines tube height
L,      502,      509
L,      510,      517
L,      518,      525
L,      526,      533
L,      534,      541
lesize,all,,,thd,1,0
/com, end lines
L,      627,      457
L,      414,      606
lesize,all,,,egfd,1,0
al,955,1369,1373,1396
al,1189,1190,1194,1374
al,1199,1200,1204,1377
al,1209,1212,1214,1378
al,1219,1222,1224,1384
al,1229,1232,1234,1391
al,1055,1394,1400,1404
al,965,1375,1376
al,1238,1242,1243,1246
al,1250,1254,1255,1258
al,1263,1266,1268,1271
al,1274,1278,1281,1282
al,1286,1290,1293,1294
al,1045,1397,1401
al,980,1406,1409
al,1299,1302,1304,1307
al,1311,1314,1316,1319
al,1323,1326,1328,1331
al,1030,1412,1416
al,995,1379,1383
al,1005,1385,1386,1390
al,1015,1392,1393
asel,s,loc,z,ibht+0.02
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
asel,s,loc,z,elev1+0.015
csys,1
asel,r,loc,x,obir,obor
csys,0
vdrag,all,,,,,,4          ! Drag Lid to Lid Gap
asel,s,loc,z,elev1+0.015
asel,r,loc,z,elev1-0.015
csys,1
asel,r,loc,x,0,obir
csys,0
agen,2,all,,,,,ltlgh
nummrg,kp
asel,s,loc,z,elev2+0.015
vdrag,all,,,,,,5          ! Drag Outer Barrier Upper Lid
asel,s,loc,z,elev3
csys,1
asel,r,loc,x,obsr,obor
csys,0
vdrag,all,,,,,,6          ! Drag Upper Skirt
/com, lines tube height
```

```
l,195,194
l,191,190
l,187,68
l,71,72
l,75,76
lesize,all,,,thd,1,0
/com, end lines
l,222,197
l,78,110
lesize,all,,,egfd,1,0
al,10,115,277,3119
al,12,13,68,3114
al,16,17,75,3115
al,20,21,85,3116
al,24,25,96,3117
al,28,29,107,3118
al,31,122,309,3120
al,32,116,281
al,34,35,71,72
al,38,39,78,79
al,42,43,88,89
al,46,47,99,100
al,50,51,110,111
al,53,121,305
al,54,74,285
al,56,57,82,83
al,60,61,92,93
al,64,65,103,104
al,67,113,301
al,114,117,289
al,95,118,119,293
al,106,120,297
asel,s,loc,z,0
vdrag,all,,,,,,7          ! Drag Inner Barrier Lower Lid
csys,0
asel,s,loc,z,-iblt
vdrag,all,,,,,,8          ! Drag Outer Barrier Lower Lid
asel,s,loc,z,elev5
csys,1
asel,r,loc,x,obsr,obor
csys,0
vdrag,all,,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
vsel,s,volu,,1,47
type,1
mat,1
vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,-iblt,elev1
csys,1
vsel,r,loc,x,0,obir
```

```
vsel,u,volu,,1,92
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
vsel,inve
vsel,u,volu,,1,92
csys,1
vsel,u,loc,x,obir,obor
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,type,,5
type,6
mat,6
vmesh,all
/com, mesh upper outer barrier adding backfill mass
vsel,inve
vsel,u,type,,1,5
type,7
mat,7
vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(3*bkht/bd)-0.01,(4*bkht/bd)+0.01
nsel,a,loc,z,(11*bkht/bd)-0.01,(12*bkht/bd)+0.01
nsel,r,loc,x,obor-0.001,obor+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini

/sol
expass,on
mxpand,8,,,yes
solve
fini

/sol
antype,spectr
spopt,sprs,,on
sed,,1
svtyp,2
freq,0.1,100
sv,,16.285,16.285
mcomb,srss,1e-8
outres,all,1
save
solve
fini
/exit
/eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans
```

```
/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ****************************************************************
   ANSYS STARTUP FILE  start.ans
   ****************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,

ABBREVIATION= PR0       /psf,pres,norm,0,

ABBREVIATION= U1        /pbc,u,1,

ABBREVIATION= U0        /pbc,u,0,

ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,
```

```
 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ***********************************************************************
    END  start.ans
    ***********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ***********************************************************************
*****************************************************************************
*****************************************************************************
*****  Seismic Analysis of 21 PWR Waste Package Under Degradation      *****
*****  Degree of Degradation in Outer Barrier:  0%                     *****
*****  Degree of Degradation in Inner Barrier:  0%                     *****
*****  Degree of Degradation in Basket Assembly:  0%                   *****
*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
*****************************************************************************
*****************************************************************************


 NUMBER OF DATA BASE PAGES IN MEMORY     (NVPAGE)=      512

 SI UNITS SPECIFIED FOR INTERNAL
  LENGTH         (l)  = METER(M)
  MASS           (M)  = KILOGRAM(KG)
  TIME           (t)  = SECOND(SEC)
  TEMPERATURE    (T)  = KELVIN(K)
  TOFFSET             = 0.0 KELVIN
  CHARGE         (Q)  = COULOMB
  CURRENT        (i)  = AMPERE (COULOMBS/SEC)
  FORCE          (f)  = NEWTON(N) (KG-M/SEC2)
  PRESSURE            = PASCAL (NEWTON/M**2)
  ENERGY         (W)  = JOULE (N-M)
  POWER          (P)  = WATT (N-M/SEC)
  CAPACITANCE    (C)  = FARAD
  INDUCTANCE     (L)  = HENRY
  MAGNETIC FLUX       = WEBER
  RESISTANCE     (R)  = OHM
  ELECTRIC POTENTIAL  = VOLT

 INPUT UNITS ARE ALSO SET TO SI
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   17:49:56  APR 19, 1996 CP=      0.390
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844



         ***** ANSYS ANALYSIS DEFINITION (PREP7) *****

 TITLE=
  21 PWR Tube Static Analysis With Backfill


 VIEW CONE ANGLE FOR WINDOW  1    0.00
  Define Parameters

 PARAMETER IBIR      =    0.7109500
```

PARAMETER OBIR = 0.7309500

PARAMETER OBSR = 0.7709500

PARAMETER OBOR = 0.8309500

PARAMETER TS1 = 0.7000000E-02

PARAMETER TS2 = 0.5000000E-02

PARAMETER TS3 = 0.1000000E-01

PARAMETER TS4 = 0.1000000E-01

PARAMETER EGIH = 0.8090000E-01

PARAMETER PIE = 3.141593

PARAMETER ANG1 = 0.5235988

PARAMETER ANG2 = 1.396263

PARAMETER ANG3 = 1.012291

PARAMETER TW = 0.2285000

PARAMETER POS1 = 0.1142500

PARAMETER POS2 = 0.1192500

PARAMETER POS3 = 0.1262500

PARAMETER POS4 = 0.1312500

PARAMETER POS5 = 0.3597500

PARAMETER POS6 = 0.3647500

PARAMETER POS7 = 0.3717500

PARAMETER POS8 = 0.3767500

PARAMETER POS9 = 0.6052500

PARAMETER POS10 = 0.6102500

PARAMETER POS11 = 0.6202500

PARAMETER POSG = 0.3747500

PARAMETER POSEI = 0.7011500

PARAMETER POSEO = 0.6993867

PARAMETER POSEN = 0.1177500

PARAMETER POSEF = 0.1277500

PARAMETER POSEG = 0.3474295

PARAMETER POSCG = 0.6040013

PARAMETER BKHT = 4.575000

PARAMETER IBHT = 4.585000

PARAMETER BGH = 0.1000000E-01

PARAMETER IBLT = 0.2500000E-01

```
 PARAMETER ELEV1    =     4.610000

 PARAMETER LTLGH    =    0.3000000E-01

 PARAMETER ELEV2    =     4.640000

 PARAMETER OBLT     =    0.1100000

 PARAMETER ELEV3    =     4.750000

 PARAMETER STHT     =    0.2250000

 PARAMETER ELEV4    =     4.975000

 PARAMETER ELEV5    =    -0.1350000

 PARAMETER ELEV6    =    -0.3600000
  Line Divisions

 PARAMETER SHD      =     1.000000

 PARAMETER OBLD     =     1.000000

 PARAMETER GD       =     1.000000

 PARAMETER IBLD     =     1.000000

 PARAMETER BD       =     15.00000

 PARAMETER HTWD     =     4.000000

 PARAMETER TWD      =     4.000000

 PARAMETER THD      =     4.000000

 PARAMETER EGFD     =     4.000000

 PARAMETER PTD      =     1.000000

 PARAMETER TTD      =     1.000000

 PARAMETER A1D      =     4.000000

 PARAMETER A2D      =     4.000000

 PARAMETER A3D      =     4.000000

 PARAMETER A4D      =     4.000000

 PARAMETER A5D      =     4.000000

 PARAMETER A6D      =     4.000000

 PARAMETER A7D      =     4.000000

 PARAMETER A8D      =     4.000000

 PARAMETER A9D      =     4.000000

 PARAMETER IBTD     =     2.000000

 PARAMETER OBITD    =     2.000000

 PARAMETER STD      =     2.000000
  Define Element Properties

 ELEMENT TYPE    1 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0
```

```
 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    2 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    3 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    4 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    5 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    6 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    7 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 REAL CONSTANT SET       7  ITEMS    1 TO    6
   0.15000E+09  0.00000E+00  0.00000E+00   1.2980       15.000       0.00000E+00
  ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
  Room Temperature Properties of Materials

 MATERIAL    1          EX   =   0.2060000E+12

 MATERIAL    2          EX   =   0.1950000E+12

 MATERIAL    3          EX   =   0.2060000E+12

 MATERIAL    4          EX   =   0.2060000E+12

 MATERIAL    5          EX   =   0.2080000E+12

 MATERIAL    6          EX   =   0.2060000E+12

 MATERIAL    7          EX   =   0.2060000E+12

 MATERIAL    1          NUXY =   0.3000000

 MATERIAL    2          NUXY =   0.2980000

 MATERIAL    3          NUXY =   0.3000000

 MATERIAL    4          NUXY =   0.3000000

 MATERIAL    5          NUXY =   0.2780000

 MATERIAL    6          NUXY =   0.3000000
```

```
MATERIAL    7          NUXY =   0.3000000
MATERIAL    1          DENS =    44646.96
MATERIAL    2          DENS =    7953.000
MATERIAL    3          DENS =    8131.000
MATERIAL    4          DENS =    8131.000
MATERIAL    5          DENS =    8442.000
MATERIAL    6          DENS =    8131.000
MATERIAL    7          DENS =    20670.00
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1   X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2   X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3   X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4   X,Y,Z=  0.126250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5   X,Y,Z=  0.131250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6   X,Y,Z=  0.359750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7   X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8   X,Y,Z=  0.371750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9   X,Y,Z=  0.376750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10   X,Y,Z=  0.605250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11   X,Y,Z=  0.610250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12   X,Y,Z=  0.620250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13   X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14   X,Y,Z=  0.131250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15   X,Y,Z=  0.359750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16   X,Y,Z=  0.376750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17   X,Y,Z=  0.605250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18   X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19   X,Y,Z=  0.126250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20   X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     21   X,Y,Z=  0.371750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     22   X,Y,Z=  0.610250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     23   X,Y,Z=  0.620250      0.117750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     24   X,Y,Z=  0.710950       9.53320      0.000000E+00  IN CSYS=  1
```

```
                    0.701132      0.117747      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT      25   X,Y,Z=  0.126250      0.126250      0.000000E+00  IN CSYS=  0
 KEYPOINT      26   X,Y,Z=  0.364750      0.126250      0.000000E+00  IN CSYS=  0
 KEYPOINT      27   X,Y,Z=  0.371750      0.126250      0.000000E+00  IN CSYS=  0
 KEYPOINT      28   X,Y,Z=  0.610250      0.126250      0.000000E+00  IN CSYS=  0
 KEYPOINT      29   X,Y,Z=  0.620250      0.127750      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT      30   X,Y,Z=  0.710950       10.3515      0.000000E+00  IN CSYS=  1
                    0.699378      0.127748      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT      31   X,Y,Z=  0.131250      0.131250      0.000000E+00  IN CSYS=  0
 KEYPOINT      32   X,Y,Z=  0.359750      0.131250      0.000000E+00  IN CSYS=  0
 KEYPOINT      33   X,Y,Z=  0.376750      0.131250      0.000000E+00  IN CSYS=  0
 KEYPOINT      34   X,Y,Z=  0.605250      0.131250      0.000000E+00  IN CSYS=  0
 KEYPOINT      35   X,Y,Z=  0.359750      0.359750      0.000000E+00  IN CSYS=  0
 KEYPOINT      36   X,Y,Z=  0.376750      0.359750      0.000000E+00  IN CSYS=  0
 KEYPOINT      37   X,Y,Z=  0.605250      0.359750      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT      38   X,Y,Z=  0.710950       29.2551      0.000000E+00  IN CSYS=  1
                    0.620270      0.347441      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT      39   X,Y,Z=  0.364750      0.364750      0.000000E+00  IN CSYS=  0
 KEYPOINT      40   X,Y,Z=  0.371750      0.364750      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT      41   X,Y,Z=  0.710950       30.8670      0.000000E+00  IN CSYS=  1
                    0.610251      0.364751      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT      42   X,Y,Z=  0.374750      0.374750      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT      43   X,Y,Z=  0.710950       31.8174      0.000000E+00  IN CSYS=  1
                    0.604118      0.374822      0.000000E+00  IN CSYS=  0
 KEYPOINT      44   X,Y,Z=  0.710950      0.000000E+00  0.000000E+00  IN CSYS=  1
                    0.710950      0.000000E+00  0.000000E+00  IN CSYS=  0
 KEYPOINT      45   X,Y,Z=  0.710950       45.0000      0.000000E+00  IN CSYS=  1
```

```
                    0.502718      0.502718      0.000000E+00  IN CSYS=  0
KEYPOINT     46  X,Y,Z= 0.730950      0.000000E+00  0.000000E+00  IN CSYS=  1
                    0.730950      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     47  X,Y,Z= 0.730950      9.53320       0.000000E+00  IN CSYS=  1
                    0.720855      0.121059      0.000000E+00  IN CSYS=  0
KEYPOINT     48  X,Y,Z= 0.730950      10.3515       0.000000E+00  IN CSYS=  1
                    0.719053      0.131342      0.000000E+00  IN CSYS=  0
KEYPOINT     49  X,Y,Z= 0.730950      29.2551       0.000000E+00  IN CSYS=  1
                    0.637719      0.357215      0.000000E+00  IN CSYS=  0
KEYPOINT     50  X,Y,Z= 0.730950      30.8670       0.000000E+00  IN CSYS=  1
                    0.627419      0.375012      0.000000E+00  IN CSYS=  0
KEYPOINT     51  X,Y,Z= 0.730950      31.8174       0.000000E+00  IN CSYS=  1
                    0.621112      0.385366      0.000000E+00  IN CSYS=  0
KEYPOINT     52  X,Y,Z= 0.730950      45.0000       0.000000E+00  IN CSYS=  1
                    0.516860      0.516860      0.000000E+00  IN CSYS=  0
KEYPOINT     53  X,Y,Z= 0.770950      0.000000E+00  0.000000E+00  IN CSYS=  1
                    0.770950      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     54  X,Y,Z= 0.770950      9.53320       0.000000E+00  IN CSYS=  1
                    0.760303      0.127684      0.000000E+00  IN CSYS=  0
KEYPOINT     55  X,Y,Z= 0.770950      10.3515       0.000000E+00  IN CSYS=  1
                    0.758402      0.138530      0.000000E+00  IN CSYS=  0
KEYPOINT     56  X,Y,Z= 0.770950      29.2551       0.000000E+00  IN CSYS=  1
                    0.672617      0.376763      0.000000E+00  IN CSYS=  0
KEYPOINT     57  X,Y,Z= 0.770950      30.8670       0.000000E+00  IN CSYS=  1
                    0.661753      0.395534      0.000000E+00  IN CSYS=  0
KEYPOINT     58  X,Y,Z= 0.770950      31.8174       0.000000E+00  IN CSYS=  1
                    0.655102      0.406455      0.000000E+00  IN CSYS=  0
KEYPOINT     59  X,Y,Z= 0.770950      45.0000       0.000000E+00  IN CSYS=  1
                    0.545144      0.545144      0.000000E+00  IN CSYS=  0
KEYPOINT     60  X,Y,Z= 0.830950      0.000000E+00  0.000000E+00  IN CSYS=  1
                    0.830950      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     61  X,Y,Z= 0.830950      9.53320       0.000000E+00  IN CSYS=  1
                    0.819474      0.137621      0.000000E+00  IN CSYS=  0
KEYPOINT     62  X,Y,Z= 0.830950      10.3515       0.000000E+00  IN CSYS=  1
                    0.817425      0.149311      0.000000E+00  IN CSYS=  0
```

```
KEYPOINT     63   X,Y,Z=  0.830950       29.2551       0.000000E+00  IN CSYS=  1

                         0.724964      0.406085      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.830950       30.8670       0.000000E+00  IN CSYS=  1

                         0.713255      0.426316      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.830950       31.8174       0.000000E+00  IN CSYS=  1

                         0.706086      0.438088      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.830950       45.0000       0.000000E+00  IN CSYS=  1

                         0.587570      0.587570      0.000000E+00  IN CSYS=  0

COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
  XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
  ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
  ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT     13 USED FOR KEYPOINT(S)      79
KEYPOINT     18 USED FOR KEYPOINT(S)      84
KEYPOINT     25 USED FOR KEYPOINT(S)      91
KEYPOINT     31 USED FOR KEYPOINT(S)      97
KEYPOINT     35 USED FOR KEYPOINT(S)     101
KEYPOINT     39 USED FOR KEYPOINT(S)     105
KEYPOINT     42 USED FOR KEYPOINT(S)     108
KEYPOINT     45 USED FOR KEYPOINT(S)     111
KEYPOINT     52 USED FOR KEYPOINT(S)     118
KEYPOINT     59 USED FOR KEYPOINT(S)     125
KEYPOINT     66 USED FOR KEYPOINT(S)     132

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT      2 USED FOR KEYPOINT(S)      79
KEYPOINT      3 USED FOR KEYPOINT(S)      84
KEYPOINT      4 USED FOR KEYPOINT(S)      91
KEYPOINT      5 USED FOR KEYPOINT(S)      97
KEYPOINT      6 USED FOR KEYPOINT(S)     101
KEYPOINT      7 USED FOR KEYPOINT(S)     105
KEYPOINT      8 USED FOR KEYPOINT(S)     108
KEYPOINT      9 USED FOR KEYPOINT(S)     111
KEYPOINT     10 USED FOR KEYPOINT(S)     118
KEYPOINT     11 USED FOR KEYPOINT(S)     125
KEYPOINT     12 USED FOR KEYPOINT(S)     132
KEYPOINT     44 USED FOR KEYPOINT(S)     164
KEYPOINT     46 USED FOR KEYPOINT(S)     166
KEYPOINT     53 USED FOR KEYPOINT(S)     173
KEYPOINT     60 USED FOR KEYPOINT(S)     180

DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   4.57500      IN CSYS=  0

LINE CONNECTS KEYPOINTS       1  1001
 LINE NO.=      1  KP1=       1  TAN1=    0.0000   0.0000  -1.0000
                   KP2=    1001  TAN2=    0.0000   0.0000   1.0000
```

```
SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =   15,  SPACING RATIO =   1.000

KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   4.58500      IN CSYS=  0

LINE CONNECTS KEYPOINTS   1001  2001
 LINE NO.=     2  KP1=   1001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   2001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   4.61000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   2001  3001
 LINE NO.=     3  KP1=   2001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   3001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   4.64000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   3001  4001
 LINE NO.=     4  KP1=   3001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   4001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   4.75000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   4001  5001
 LINE NO.=     5  KP1=   4001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   5001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   4.97500      IN CSYS=  0

LINE CONNECTS KEYPOINTS   5001  6001
 LINE NO.=     6  KP1=   5001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   6001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.250000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  7001
 LINE NO.=     7  KP1=      1  TAN1=    0.0000   0.0000   1.0000
                  KP2=   7001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.135000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.360000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   8001  9001
```

```
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =   1.000
 Line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     72    81
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     81  TAN2=    1.0000   0.0000   0.0000
```

```
LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=     26  KP1=     73  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     86  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=     27  KP1=     74  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     87  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=     28  KP1=     75  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     82  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=     29  KP1=     76  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     83  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=     30  KP1=     77  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     88  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=     31  KP1=     78  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     89  TAN2=     1.0000    0.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=     32  KP1=    211  TAN1=    -1.0000    0.0001    0.0000
                   KP2=    218  TAN2=     1.0000   -0.0001    0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=     33  KP1=    210  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    220  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=     34  KP1=    215  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    217  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=     35  KP1=    214  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    216  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=     36  KP1=    209  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    219  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=     37  KP1=    208  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    159  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=     38  KP1=    213  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    155  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=     39  KP1=    151  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    152  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    145   146
 LINE NO.=     40  KP1=    145  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    146  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    139   140
 LINE NO.=     41  KP1=    139  TAN1=    -1.0000    0.0000    0.0000
                   KP2=    140  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    134   135
```

```
 LINE NO.=    42  KP1=    134  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    135  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     14    15
 LINE NO.=    43  KP1=     14  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     15  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     19    20
 LINE NO.=    44  KP1=     19  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     20  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     25    26
 LINE NO.=    45  KP1=     25  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     26  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     31    32
 LINE NO.=    46  KP1=     31  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     32  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     98    35
 LINE NO.=    47  KP1=     98  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     35  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     92    39
 LINE NO.=    48  KP1=     92  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     39  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     93   106
 LINE NO.=    49  KP1=     93  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    106  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     99   102
 LINE NO.=    50  KP1=     99  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    102  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    100   103
 LINE NO.=    51  KP1=    100  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    103  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     94   107
 LINE NO.=    52  KP1=     94  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    107  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     95   104
 LINE NO.=    53  KP1=     95  TAN1=   -1.0000  -0.0001   0.0000
                  KP2=    104  TAN2=    1.0000   0.0001   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 Line set 3 Tube Widths on End Column

LINE CONNECTS KEYPOINTS    162   163
 LINE NO.=    54  KP1=    162  TAN1=   -1.0000   0.0003   0.0000
                  KP2=    163  TAN2=    1.0000  -0.0003   0.0000

LINE CONNECTS KEYPOINTS    160   161
 LINE NO.=    55  KP1=    160  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    161  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    156   157
 LINE NO.=    56  KP1=    156  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    157  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    153   154
 LINE NO.=    57  KP1=    153  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    154  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    147   148
 LINE NO.=    58  KP1=    147  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    148  TAN2=    1.0000   0.0000   0.0000
```

```
LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    142  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    137  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     17  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     22  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     28  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     34  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     37  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     41  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -1.0000   -0.0003    0.0000
                  KP2=     43  TAN2=    1.0000    0.0003    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
    TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    200  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    204  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    209  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    214  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    216  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=    220  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    219  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=    221  TAN1=    0.0003   -1.0000    0.0000
                  KP2=    162  TAN2=   -0.0003    1.0000    0.0000

LINE CONNECTS KEYPOINTS    199   198
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```
 LINE NO.=    75  KP1=    199  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    198  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=    76  KP1=    203  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    202  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=    77  KP1=    208  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    145  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=    78  KP1=    213  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    151  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=    79  KP1=    155  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    152  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=    80  KP1=    159  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    146  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=    81  KP1=    160  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    147  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=    82  KP1=    156  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    153  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=    83  KP1=    157  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    154  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=    84  KP1=    161  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    148  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=    85  KP1=    133  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     13  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=    86  KP1=    138  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     18  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=    87  KP1=    139  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     19  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=    88  KP1=    134  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     14  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=    89  KP1=    135  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     15  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
 LINE NO.=    90  KP1=    140  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     20  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    141    21
 LINE NO.=    91  KP1=    141  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     21  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    136    16
 LINE NO.=    92  KP1=    136  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     16  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=     93  KP1=    137  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     17  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=     94  KP1=    142  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     22  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=     95  KP1=    143  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     23  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=     96  KP1=     80  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     81  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=     97  KP1=     85  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     86  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=     98  KP1=     25  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     92  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=     99  KP1=     31  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     98  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=    100  KP1=     32  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     35  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=    101  KP1=     26  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     39  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=    102  KP1=     27  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     40  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=    103  KP1=     33  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     36  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=    104  KP1=     34  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     37  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=    105  KP1=     28  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     41  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=    106  KP1=     29  TAN1=   -0.0001   -1.0000    0.0000
                   KP2=     38  TAN2=    0.0001    1.0000    0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=    107  KP1=     82  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     83  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=    108  KP1=     87  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     88  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=    109  KP1=     93  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     94  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     99   100
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 LINE NO.=   110  KP1=     99  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    100  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=   111  KP1=    102  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    103  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=   112  KP1=    106  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    107  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=   113  KP1=     42  TAN1=   -0.0003  -1.0000   0.0000
                  KP2=    109  TAN2=    0.0003   1.0000   0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=   114  KP1=    158  TAN1=    0.0001  -1.0000   0.0000
                  KP2=    149  TAN2=   -0.0001   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=   115  KP1=    207  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    206  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=   116  KP1=    212  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    211  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=   117  KP1=    150  TAN1=    1.0000   0.0000   0.0000
                  KP2=    149  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=   118  KP1=    144  TAN1=    1.0000   0.0000   0.0000
                  KP2=    143  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=   119  KP1=     24  TAN1=    1.0000   0.0000   0.0000
                  KP2=     23  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=   120  KP1=     30  TAN1=    1.0000   0.0000   0.0000
                  KP2=     29  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=   121  KP1=     96  TAN1=    0.0000   1.0000   0.0000
                  KP2=     95  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=   122  KP1=     90  TAN1=    0.0000   1.0000   0.0000
                  KP2=     89  TAN2=    0.0000  -1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
  line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
 LINE NO.=   123  KP1=    197  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    196  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    206   205
 LINE NO.=   124  KP1=    206  TAN1=   -0.1483  -0.9889   0.0000
                  KP2=    205  TAN2=    0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS    211   210
 LINE NO.=   125  KP1=    211  TAN1=    0.1483  -0.9889   0.0000
                  KP2=    210  TAN2=   -0.1483   0.9889   0.0000
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LINE CONNECTS KEYPOINTS    207   212
 LINE NO.=   126  KP1=     207  TAN1=   -0.9850  -0.1727   0.0000
                  KP2=     212  TAN2=    0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    206   211
 LINE NO.=   127  KP1=     206  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     211  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    205   210
 LINE NO.=   128  KP1=     205  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     210  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    218   220
 LINE NO.=   129  KP1=     218  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     220  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    220   221
 LINE NO.=   130  KP1=     220  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=     221  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    193   192
 LINE NO.=   131  KP1=     193  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     192  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   203
 LINE NO.=   132  KP1=     204  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     203  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    209   208
 LINE NO.=   133  KP1=     209  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     208  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   209
 LINE NO.=   134  KP1=     204  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     209  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    203   208
 LINE NO.=   135  KP1=     203  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     208  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    219   159
 LINE NO.=   136  KP1=     219  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     159  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    162   160
 LINE NO.=   137  KP1=     162  TAN1=    0.2873  -0.9578   0.0000
                  KP2=     160  TAN2=   -0.2873   0.9578   0.0000

LINE CONNECTS KEYPOINTS    163   161
 LINE NO.=   138  KP1=     163  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=     161  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    161   158
 LINE NO.=   139  KP1=     161  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=     158  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    219   162
 LINE NO.=   140  KP1=     219  TAN1=   -0.9578   0.2873   0.0000
                  KP2=     162  TAN2=    0.9578  -0.2873   0.0000

LINE CONNECTS KEYPOINTS    159   160
 LINE NO.=   141  KP1=     159  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     160  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   188
 LINE NO.=   142  KP1=     189  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     188  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    202   138
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 LINE NO.=   143  KP1=    202  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    138  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=    145  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    139  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=    202  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    145  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=    138  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    139  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=    146  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    140  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=    147  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    141  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=    146  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    147  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=    140  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    141  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=    148  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    142  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=    149  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    143  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=    148  TAN1=   -0.9889   0.1483   0.0000
                  KP2=    149  TAN2=    0.9889  -0.1483   0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=    142  TAN1=   -0.9889  -0.1483   0.0000
                  KP2=    143  TAN2=    0.9889   0.1483   0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=    150  TAN1=   -0.1727  -0.9850   0.0000
                  KP2=    144  TAN2=    0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=     69  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     70  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=     18  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     85  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     19    25
 LINE NO.=   158  KP1=     19  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     25  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=     18  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     19  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     85    25
 LINE NO.=   160  KP1=     85  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     25  TAN2=    1.0000   0.0000   0.0000
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LINE CONNECTS KEYPOINTS     20    26
 LINE NO.=   161  KP1=      20  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      26  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     21    27
 LINE NO.=   162  KP1=      21  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      27  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     20    21
 LINE NO.=   163  KP1=      20  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      21  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     26    27
 LINE NO.=   164  KP1=      26  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      27  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     22    28
 LINE NO.=   165  KP1=      22  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      28  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     22    23
 LINE NO.=   166  KP1=      22  TAN1=   -0.9889    0.1483    0.0000
                  KP2=      23  TAN2=    0.9889   -0.1483    0.0000

LINE CONNECTS KEYPOINTS     28    29
 LINE NO.=   167  KP1=      28  TAN1=   -0.9889   -0.1483    0.0000
                  KP2=      29  TAN2=    0.9889    0.1483    0.0000

LINE CONNECTS KEYPOINTS     23    29
 LINE NO.=   168  KP1=      23  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      29  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     24    30
 LINE NO.=   169  KP1=      24  TAN1=    0.1727   -0.9850    0.0000
                  KP2=      30  TAN2=   -0.1727    0.9850    0.0000

LINE CONNECTS KEYPOINTS     73    74
 LINE NO.=   170  KP1=      73  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      74  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     86    87
 LINE NO.=   171  KP1=      86  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      87  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     92    93
 LINE NO.=   172  KP1=      92  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      93  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     86    92
 LINE NO.=   173  KP1=      86  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      92  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     87    93
 LINE NO.=   174  KP1=      87  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      93  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     39   106
 LINE NO.=   175  KP1=      39  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     106  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     40    42
 LINE NO.=   176  KP1=      40  TAN1=   -0.2873   -0.9578    0.0000
                  KP2=      42  TAN2=    0.2873    0.9578    0.0000

LINE CONNECTS KEYPOINTS     39    40
 LINE NO.=   177  KP1=      39  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      40  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    106    42
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LINE NO.=	178	KP1=	106	TAN1=	-0.9578	-0.2873	0.0000
		KP2=	42	TAN2=	0.9578	0.2873	0.0000
LINE CONNECTS KEYPOINTS			38	41			
LINE NO.=	179	KP1=	38	TAN1=	0.5009	-0.8655	0.0000
		KP2=	41	TAN2=	-0.5009	0.8655	0.0000
LINE CONNECTS KEYPOINTS			41	43			
LINE NO.=	180	KP1=	41	TAN1=	0.5201	-0.8541	0.0000
		KP2=	43	TAN2=	-0.5201	0.8541	0.0000
LINE CONNECTS KEYPOINTS			77	78			
LINE NO.=	181	KP1=	77	TAN1=	0.0000	-1.0000	0.0000
		KP2=	78	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS			88	89			
LINE NO.=	182	KP1=	88	TAN1=	0.1483	-0.9889	0.0000
		KP2=	89	TAN2=	-0.1483	0.9889	0.0000
LINE CONNECTS KEYPOINTS			94	95			
LINE NO.=	183	KP1=	94	TAN1=	-0.1483	-0.9889	0.0000
		KP2=	95	TAN2=	0.1483	0.9889	0.0000
LINE CONNECTS KEYPOINTS			88	94			
LINE NO.=	184	KP1=	88	TAN1=	-1.0000	0.0000	0.0000
		KP2=	94	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			89	95			
LINE NO.=	185	KP1=	89	TAN1=	-1.0000	0.0000	0.0000
		KP2=	95	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS			90	96			
LINE NO.=	186	KP1=	90	TAN1=	-0.9850	0.1727	0.0000
		KP2=	96	TAN2=	0.9850	-0.1727	0.0000
LINE CONNECTS KEYPOINTS			109	107			
LINE NO.=	187	KP1=	109	TAN1=	0.8541	-0.5201	0.0000
		KP2=	107	TAN2=	-0.8541	0.5201	0.0000
LINE CONNECTS KEYPOINTS			107	104			
LINE NO.=	188	KP1=	107	TAN1=	0.8655	-0.5009	0.0000
		KP2=	104	TAN2=	-0.8655	0.5009	0.0000
LINE CONNECTS KEYPOINTS			224	225			
LINE NO.=	189	KP1=	224	TAN1=	-0.9850	-0.1727	0.0000
		KP2=	225	TAN2=	0.9850	0.1727	0.0000
LINE CONNECTS KEYPOINTS			230	231			
LINE NO.=	190	KP1=	230	TAN1=	-0.9850	-0.1727	0.0000
		KP2=	231	TAN2=	0.9850	0.1727	0.0000
LINE CONNECTS KEYPOINTS			236	237			
LINE NO.=	191	KP1=	236	TAN1=	-0.9850	-0.1727	0.0000
		KP2=	237	TAN2=	0.9850	0.1727	0.0000
LINE CONNECTS KEYPOINTS			226	227			
LINE NO.=	192	KP1=	226	TAN1=	-0.8655	-0.5009	0.0000
		KP2=	227	TAN2=	0.8655	0.5009	0.0000
LINE CONNECTS KEYPOINTS			227	228			
LINE NO.=	193	KP1=	227	TAN1=	-0.8541	-0.5201	0.0000
		KP2=	228	TAN2=	0.8541	0.5201	0.0000
LINE CONNECTS KEYPOINTS			232	233			
LINE NO.=	194	KP1=	232	TAN1=	-0.8655	-0.5009	0.0000
		KP2=	233	TAN2=	0.8655	0.5009	0.0000
LINE CONNECTS KEYPOINTS			233	234			
LINE NO.=	195	KP1=	233	TAN1=	-0.8541	-0.5201	0.0000
		KP2=	234	TAN2=	0.8541	0.5201	0.0000

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LINE CONNECTS KEYPOINTS    238   239
 LINE NO.=    196  KP1=    238  TAN1=   -0.8655  -0.5009   0.0000
                   KP2=    239  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    239   240
 LINE NO.=    197  KP1=    239  TAN1=   -0.8541  -0.5201   0.0000
                   KP2=    240  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    171   170
 LINE NO.=    198  KP1=    171  TAN1=   -0.5201  -0.8541   0.0000
                   KP2=    170  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    170   169
 LINE NO.=    199  KP1=    170  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=    169  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    178   177
 LINE NO.=    200  KP1=    178  TAN1=   -0.5201  -0.8541   0.0000
                   KP2=    177  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    177   176
 LINE NO.=    201  KP1=    177  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=    176  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    185   184
 LINE NO.=    202  KP1=    185  TAN1=   -0.5201  -0.8541   0.0000
                   KP2=    184  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    184   183
 LINE NO.=    203  KP1=    184  TAN1=   -0.5009  -0.8655   0.0000
                   KP2=    183  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    168   167
 LINE NO.=    204  KP1=    168  TAN1=   -0.1727  -0.9850   0.0000
                   KP2=    167  TAN2=    0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS    175   174
 LINE NO.=    205  KP1=    175  TAN1=   -0.1727  -0.9850   0.0000
                   KP2=    174  TAN2=    0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS    182   181
 LINE NO.=    206  KP1=    182  TAN1=   -0.1727  -0.9850   0.0000
                   KP2=    181  TAN2=    0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS     47    48
 LINE NO.=    207  KP1=     47  TAN1=    0.1727  -0.9850   0.0000
                   KP2=     48  TAN2=   -0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS     54    55
 LINE NO.=    208  KP1=     54  TAN1=    0.1727  -0.9850   0.0000
                   KP2=     55  TAN2=   -0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS     61    62
 LINE NO.=    209  KP1=     61  TAN1=    0.1727  -0.9850   0.0000
                   KP2=     62  TAN2=   -0.1727   0.9850   0.0000

LINE CONNECTS KEYPOINTS     49    50
 LINE NO.=    210  KP1=     49  TAN1=    0.5009  -0.8655   0.0000
                   KP2=     50  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     50    51
 LINE NO.=    211  KP1=     50  TAN1=    0.5201  -0.8541   0.0000
                   KP2=     51  TAN2=   -0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS     56    57
 LINE NO.=    212  KP1=     56  TAN1=    0.5009  -0.8655   0.0000
                   KP2=     57  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     57    58
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 LINE NO.=   213  KP1=     57  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     58  TAN2=   -0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS     63    64
 LINE NO.=   214  KP1=     63  TAN1=    0.5009  -0.8655   0.0000
                  KP2=     64  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     64    65
 LINE NO.=   215  KP1=     64  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     65  TAN2=   -0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    117   116
 LINE NO.=   216  KP1=    117  TAN1=    0.8541  -0.5201   0.0000
                  KP2=    116  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    116   115
 LINE NO.=   217  KP1=    116  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    115  TAN2=   -0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    124   123
 LINE NO.=   218  KP1=    124  TAN1=    0.8541  -0.5201   0.0000
                  KP2=    123  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    123   122
 LINE NO.=   219  KP1=    123  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    122  TAN2=   -0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    131   130
 LINE NO.=   220  KP1=    131  TAN1=    0.8541  -0.5201   0.0000
                  KP2=    130  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    130   129
 LINE NO.=   221  KP1=    130  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    129  TAN2=   -0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    114   113
 LINE NO.=   222  KP1=    114  TAN1=    0.9850  -0.1727   0.0000
                  KP2=    113  TAN2=   -0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    121   120
 LINE NO.=   223  KP1=    121  TAN1=    0.9850  -0.1727   0.0000
                  KP2=    120  TAN2=   -0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    128   127
 LINE NO.=   224  KP1=    128  TAN1=    0.9850  -0.1727   0.0000
                  KP2=    127  TAN2=   -0.9850   0.1727   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000
 line set 7 tube thickness

LINE CONNECTS KEYPOINTS    196   195
 LINE NO.=   225  KP1=    196  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    195  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   201
 LINE NO.=   226  KP1=    205  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    201  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    204   200
 LINE NO.=   227  KP1=    204  TAN1=    0.7071   0.7071   0.0000
                  KP2=    200  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    193   194
 LINE NO.=   228  KP1=    193  TAN1=    0.0000   1.0000   0.0000
                  KP2=    194  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   215
 LINE NO.=   229  KP1=    210  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    215  TAN2=    0.7071   0.7071   0.0000
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LINE CONNECTS KEYPOINTS    220   217
 LINE NO.=   230  KP1=     220  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     217  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    219   216
 LINE NO.=   231  KP1=     219  TAN1=    0.7071   0.7071   0.0000
                  KP2=     216  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    209   214
 LINE NO.=   232  KP1=     209  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     214  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    192   191
 LINE NO.=   233  KP1=     192  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     191  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   199
 LINE NO.=   234  KP1=     203  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     199  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    202   198
 LINE NO.=   235  KP1=     202  TAN1=    0.7071   0.7071   0.0000
                  KP2=     198  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    189   190
 LINE NO.=   236  KP1=     189  TAN1=    0.0000   1.0000   0.0000
                  KP2=     190  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   213
 LINE NO.=   237  KP1=     208  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     213  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    159   155
 LINE NO.=   238  KP1=     159  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     155  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    146   152
 LINE NO.=   239  KP1=     146  TAN1=    0.7071   0.7071   0.0000
                  KP2=     152  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    145   151
 LINE NO.=   240  KP1=     145  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     151  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    160   156
 LINE NO.=   241  KP1=     160  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     156  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    161   157
 LINE NO.=   242  KP1=     161  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     157  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    148   154
 LINE NO.=   243  KP1=     148  TAN1=    0.7071   0.7071   0.0000
                  KP2=     154  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    147   153
 LINE NO.=   244  KP1=     147  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     153  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    188   187
 LINE NO.=   245  KP1=     188  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     187  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138   133
 LINE NO.=   246  KP1=     138  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     133  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     18    13
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 LINE NO.=   247  KP1=     18  TAN1=    0.7071   0.7071   0.0000
                  KP2=     13  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     69    68
 LINE NO.=   248  KP1=     69  TAN1=    0.0000   1.0000   0.0000
                  KP2=     68  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    139   134
 LINE NO.=   249  KP1=    139  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    134  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    140   135
 LINE NO.=   250  KP1=    140  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    135  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     20    15
 LINE NO.=   251  KP1=     20  TAN1=    0.7071   0.7071   0.0000
                  KP2=     15  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     19    14
 LINE NO.=   252  KP1=     19  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     14  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    141   136
 LINE NO.=   253  KP1=    141  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    136  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    142   137
 LINE NO.=   254  KP1=    142  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    137  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     22    17
 LINE NO.=   255  KP1=     22  TAN1=    0.7071   0.7071   0.0000
                  KP2=     17  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     21    16
 LINE NO.=   256  KP1=     21  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     16  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     70    71
 LINE NO.=   257  KP1=     70  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     71  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    80
 LINE NO.=   258  KP1=     85  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     80  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     86    81
 LINE NO.=   259  KP1=     86  TAN1=    0.7071   0.7071   0.0000
                  KP2=     81  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     73    72
 LINE NO.=   260  KP1=     73  TAN1=    0.0000   1.0000   0.0000
                  KP2=     72  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    31
 LINE NO.=   261  KP1=     25  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     31  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     26    32
 LINE NO.=   262  KP1=     26  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     32  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     39    35
 LINE NO.=   263  KP1=     39  TAN1=    0.7071   0.7071   0.0000
                  KP2=     35  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     92    98
 LINE NO.=   264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     98  TAN2=    0.7071  -0.7071   0.0000
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LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=      27  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      33  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=      28  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      34  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=      41  TAN1=    0.7071   0.7071   0.0000
                  KP2=      37  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=      40  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      36  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=      74  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      75  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=      87  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      82  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=      88  TAN1=    0.7071   0.7071   0.0000
                  KP2=      83  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=      77  TAN1=    0.0000   1.0000   0.0000
                  KP2=      76  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=      93  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      99  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=     106  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     102  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=     107  TAN1=    0.7071   0.7071   0.0000
                  KP2=     103  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=      94  TAN1=   -0.7071   0.7071   0.0000
                  KP2=     100  TAN2=    0.7071  -0.7071   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=     222  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     207  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS    223   224
 LINE NO.=   278  KP1=     223  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     224  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279  KP1=     229  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     230  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS    235   236
 LINE NO.=   280  KP1=     235  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     236  TAN2=    0.9862   0.1656   0.0000
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SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281  KP1=    212  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=    218  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282  KP1=    225  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=    226  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283  KP1=    231  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=    232  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284  KP1=    237  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=    238  TAN2=    0.8725   0.4887   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285  KP1=    221  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=    163  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286  KP1=    228  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=    171  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287  KP1=    234  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=    178  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288  KP1=    240  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=    185  TAN2=    0.5272   0.8497   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289  KP1=    158  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    150  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290  KP1=    169  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    168  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291  KP1=    176  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    175  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292  KP1=    183  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    182  TAN2=    0.1797   0.9837   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     24  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    167    47
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 LINE NO.=   294  KP1=    167  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     47  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=    174  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     54  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=    181  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     61  TAN2=   -0.1656   0.9862   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=     30  TAN1=    0.1797  -0.9837   0.0000
                  KP2=     38  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=     48  TAN1=    0.1797  -0.9837   0.0000
                  KP2=     49  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=     55  TAN1=    0.1797  -0.9837   0.0000
                  KP2=     56  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=     62  TAN1=    0.1797  -0.9837   0.0000
                  KP2=     63  TAN2=   -0.4887   0.8725   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=     43  TAN1=    0.5272  -0.8497   0.0000
                  KP2=    109  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=     51  TAN1=    0.5272  -0.8497   0.0000
                  KP2=    117  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=     58  TAN1=    0.5272  -0.8497   0.0000
                  KP2=    124  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=     65  TAN1=    0.5272  -0.8497   0.0000
                  KP2=    131  TAN2=   -0.8497   0.5272   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=    104  TAN1=    0.8725  -0.4887   0.0000
                  KP2=     96  TAN2=   -0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS    115   114
 LINE NO.=   306  KP1=    115  TAN1=    0.8725  -0.4887   0.0000
                  KP2=    114  TAN2=   -0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307  KP1=    122  TAN1=    0.8725  -0.4887   0.0000
                  KP2=    121  TAN2=   -0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS    129   128
 LINE NO.=   308  KP1=    129  TAN1=    0.8725  -0.4887   0.0000
                  KP2=    128  TAN2=   -0.9837   0.1797   0.0000
```

```
SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=     90  TAN1=    0.9862  -0.1656   0.0000
                  KP2=    110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=    113  TAN1=    0.9862  -0.1656   0.0000
                  KP2=    112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=    120  TAN1=    0.9862  -0.1656   0.0000
                  KP2=    119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=    127  TAN1=    0.9862  -0.1656   0.0000
                  KP2=    126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=    222  TAN1=    0.0000   1.0000   0.0000
                  KP2=    223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=    207  TAN1=   -0.1656   0.9862   0.0000
                  KP2=    224  TAN2=    0.1656  -0.9862   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=    212  TAN1=   -0.1797   0.9837   0.0000
                  KP2=    225  TAN2=    0.1797  -0.9837   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=    218  TAN1=   -0.4887   0.8725   0.0000
                  KP2=    226  TAN2=    0.4887  -0.8725   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=    220  TAN1=   -0.5130   0.8584   0.0000
                  KP2=    227  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=    221  TAN1=   -0.5272   0.8497   0.0000
                  KP2=    228  TAN2=    0.5272  -0.8497   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=    163  TAN1=   -0.8497   0.5272   0.0000
                  KP2=    171  TAN2=    0.8497  -0.5272   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=    161  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    170  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    158   169
 LINE NO.=   321  KP1=    158  TAN1=   -0.8725   0.4887   0.0000
                  KP2=    169  TAN2=    0.8725  -0.4887   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=    150  TAN1=   -0.9837   0.1797   0.0000
                  KP2=    168  TAN2=    0.9837  -0.1797   0.0000

LINE CONNECTS KEYPOINTS    144   167
 LINE NO.=   323  KP1=    144  TAN1=   -0.9862   0.1656   0.0000
                  KP2=    167  TAN2=    0.9862  -0.1656   0.0000
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LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=      24  TAN1=   -0.9862  -0.1656   0.0000
                  KP2=      47  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=      30  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=      48  TAN2=    0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=      38  TAN1=   -0.8725  -0.4887   0.0000
                  KP2=      49  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=      41  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=      50  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=      43  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=      51  TAN2=    0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=     109  TAN1=   -0.5272  -0.8497   0.0000
                  KP2=     117  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=     107  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=     116  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=     104  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=     115  TAN2=    0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=      96  TAN1=   -0.1797  -0.9837   0.0000
                  KP2=     114  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=      90  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     113  TAN2=    0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=     110  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     112  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=     223  TAN1=    0.0000   1.0000   0.0000
                  KP2=     229  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=     224  TAN1=   -0.1656   0.9862   0.0000
                  KP2=     230  TAN2=    0.1656  -0.9862   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=     225  TAN1=   -0.1797   0.9837   0.0000
                  KP2=     231  TAN2=    0.1797  -0.9837   0.0000

LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=   338  KP1=     226  TAN1=   -0.4887   0.8725   0.0000
                  KP2=     232  TAN2=    0.4887  -0.8725   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=   339  KP1=     227  TAN1=   -0.5130   0.8584   0.0000
                  KP2=     233  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    228   234
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 LINE NO.=   340  KP1=    228  TAN1=   -0.5272   0.8497   0.0000
                  KP2=    234  TAN2=    0.5272  -0.8497   0.0000

LINE CONNECTS KEYPOINTS    171   178
 LINE NO.=   341  KP1=    171  TAN1=   -0.8497   0.5272   0.0000
                  KP2=    178  TAN2=    0.8497  -0.5272   0.0000

LINE CONNECTS KEYPOINTS    170   177
 LINE NO.=   342  KP1=    170  TAN1=   -0.8584   0.5130   0.0000
                  KP2=    177  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    169   176
 LINE NO.=   343  KP1=    169  TAN1=   -0.8725   0.4887   0.0000
                  KP2=    176  TAN2=    0.8725  -0.4887   0.0000

LINE CONNECTS KEYPOINTS    168   175
 LINE NO.=   344  KP1=    168  TAN1=   -0.9837   0.1797   0.0000
                  KP2=    175  TAN2=    0.9837  -0.1797   0.0000

LINE CONNECTS KEYPOINTS    167   174
 LINE NO.=   345  KP1=    167  TAN1=   -0.9862   0.1656   0.0000
                  KP2=    174  TAN2=    0.9862  -0.1656   0.0000

LINE CONNECTS KEYPOINTS     47    54
 LINE NO.=   346  KP1=     47  TAN1=   -0.9862  -0.1656   0.0000
                  KP2=     54  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS     48    55
 LINE NO.=   347  KP1=     48  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=     55  TAN2=    0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS     49    56
 LINE NO.=   348  KP1=     49  TAN1=   -0.8725  -0.4887   0.0000
                  KP2=     56  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS     50    57
 LINE NO.=   349  KP1=     50  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=     57  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     51    58
 LINE NO.=   350  KP1=     51  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=     58  TAN2=    0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS    117   124
 LINE NO.=   351  KP1=    117  TAN1=   -0.5272  -0.8497   0.0000
                  KP2=    124  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    116   123
 LINE NO.=   352  KP1=    116  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=    123  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    115   122
 LINE NO.=   353  KP1=    115  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    122  TAN2=    0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS    114   121
 LINE NO.=   354  KP1=    114  TAN1=   -0.1797  -0.9837   0.0000
                  KP2=    121  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    113   120
 LINE NO.=   355  KP1=    113  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=    120  TAN2=    0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    112   119
 LINE NO.=   356  KP1=    112  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    119  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 19 skirt thickness
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 LINE CONNECTS KEYPOINTS    229   235
  LINE NO.=   357  KP1=     229  TAN1=    0.0000   1.0000   0.0000
                   KP2=     235  TAN2=    0.0000  -1.0000   0.0000

 LINE CONNECTS KEYPOINTS    230   236
  LINE NO.=   358  KP1=     230  TAN1=   -0.1656   0.9862   0.0000
                   KP2=     236  TAN2=    0.1656  -0.9862   0.0000

 LINE CONNECTS KEYPOINTS    231   237
  LINE NO.=   359  KP1=     231  TAN1=   -0.1797   0.9837   0.0000
                   KP2=     237  TAN2=    0.1797  -0.9837   0.0000

 LINE CONNECTS KEYPOINTS    232   238
  LINE NO.=   360  KP1=     232  TAN1=   -0.4887   0.8725   0.0000
                   KP2=     238  TAN2=    0.4887  -0.8725   0.0000

 LINE CONNECTS KEYPOINTS    233   239
  LINE NO.=   361  KP1=     233  TAN1=   -0.5130   0.8584   0.0000
                   KP2=     239  TAN2=    0.5130  -0.8584   0.0000

 LINE CONNECTS KEYPOINTS    234   240
  LINE NO.=   362  KP1=     234  TAN1=   -0.5272   0.8497   0.0000
                   KP2=     240  TAN2=    0.5272  -0.8497   0.0000

 LINE CONNECTS KEYPOINTS    178   185
  LINE NO.=   363  KP1=     178  TAN1=   -0.8497   0.5272   0.0000
                   KP2=     185  TAN2=    0.8497  -0.5272   0.0000

 LINE CONNECTS KEYPOINTS    177   184
  LINE NO.=   364  KP1=     177  TAN1=   -0.8584   0.5130   0.0000
                   KP2=     184  TAN2=    0.8584  -0.5130   0.0000

 LINE CONNECTS KEYPOINTS    176   183
  LINE NO.=   365  KP1=     176  TAN1=   -0.8725   0.4887   0.0000
                   KP2=     183  TAN2=    0.8725  -0.4887   0.0000

 LINE CONNECTS KEYPOINTS    175   182
  LINE NO.=   366  KP1=     175  TAN1=   -0.9837   0.1797   0.0000
                   KP2=     182  TAN2=    0.9837  -0.1797   0.0000

 LINE CONNECTS KEYPOINTS    174   181
  LINE NO.=   367  KP1=     174  TAN1=   -0.9862   0.1656   0.0000
                   KP2=     181  TAN2=    0.9862  -0.1656   0.0000

 LINE CONNECTS KEYPOINTS     54    61
  LINE NO.=   368  KP1=      54  TAN1=   -0.9862  -0.1656   0.0000
                   KP2=      61  TAN2=    0.9862   0.1656   0.0000

 LINE CONNECTS KEYPOINTS     55    62
  LINE NO.=   369  KP1=      55  TAN1=   -0.9837  -0.1797   0.0000
                   KP2=      62  TAN2=    0.9837   0.1797   0.0000

 LINE CONNECTS KEYPOINTS     56    63
  LINE NO.=   370  KP1=      56  TAN1=   -0.8725  -0.4887   0.0000
                   KP2=      63  TAN2=    0.8725   0.4887   0.0000

 LINE CONNECTS KEYPOINTS     57    64
  LINE NO.=   371  KP1=      57  TAN1=   -0.8584  -0.5130   0.0000
                   KP2=      64  TAN2=    0.8584   0.5130   0.0000

 LINE CONNECTS KEYPOINTS     58    65
  LINE NO.=   372  KP1=      58  TAN1=   -0.8497  -0.5272   0.0000
                   KP2=      65  TAN2=    0.8497   0.5272   0.0000

 LINE CONNECTS KEYPOINTS    124   131
  LINE NO.=   373  KP1=     124  TAN1=   -0.5272  -0.8497   0.0000
                   KP2=     131  TAN2=    0.5272   0.8497   0.0000

 LINE CONNECTS KEYPOINTS    123   130
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 LINE NO.=   374  KP1=    123  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=    130  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    122   129
 LINE NO.=   375  KP1=    122  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=    129  TAN2=    0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS    121   128
 LINE NO.=   376  KP1=    121  TAN1=   -0.1797  -0.9837   0.0000
                  KP2=    128  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    120   127
 LINE NO.=   377  KP1=    120  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=    127  TAN2=    0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    119   126
 LINE NO.=   378  KP1=    119  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    126  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000
 area set 1, tubes

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    195   196   205   201

    AREA NUMBER =      1

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    200   201   205   204

    AREA NUMBER =      2

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    193   194   200   204

    AREA NUMBER =      3

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    191   192   203   199

    AREA NUMBER =      4

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    198   199   203   202

    AREA NUMBER =      5

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    189   190   198   202

    AREA NUMBER =      6

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    187   188   138   133

    AREA NUMBER =      7

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    133   138    18    13

    AREA NUMBER =      8

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     69    68    13    18

    AREA NUMBER =      9

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     71    70    85    80
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    AREA NUMBER =      10

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      80     85     86     81

    AREA NUMBER =      11

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      73     72     81     86

    AREA NUMBER =      12

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      75     74     87     82

    AREA NUMBER =      13

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      82     87     88     83

    AREA NUMBER =      14

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      77     76     83     88

    AREA NUMBER =      15

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     209    210    215    214

    AREA NUMBER =      16

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     215    210    220    217

    AREA NUMBER =      17

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     216    217    220    219

    AREA NUMBER =      18

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     209    214    216    219

    AREA NUMBER =      19

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     145    208    213    151

    AREA NUMBER =      20

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     213    208    159    155

    AREA NUMBER =      21

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     152    155    159    146

    AREA NUMBER =      22

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     145    151    152    146

    AREA NUMBER =      23

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     134    139    140    135
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    AREA NUMBER =     24

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    135   140    20    15

    AREA NUMBER =     25

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19    14    15    20

    AREA NUMBER =     26

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19   139   134    14

    AREA NUMBER =     27

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    25    31    98

    AREA NUMBER =     28

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31    25    26    32

    AREA NUMBER =     29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32    26    39    35

    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    98    35    39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    93    99   100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99    93   106   102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102   106   107   103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94   100   103   107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156   160   161   157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157   161   148   154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   153   154   148
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    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   160   156   153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136   141   142   137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137   142    22    17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    16    17    22

    AREA NUMBER =     42

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34

    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    202   203   208   145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146   159   160   147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188   189   202   138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138   202   145   139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139   145   146   140

    AREA NUMBER =     56

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142

    AREA NUMBER =     58

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     18   138   139    19

    AREA NUMBER =     59

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     20   140   141    21

    AREA NUMBER =     60

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     70    69    18    85

    AREA NUMBER =     61

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     85    18    19    25

    AREA NUMBER =     62

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     25    19    20    26

    AREA NUMBER =     63

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     26    20    21    27

    AREA NUMBER =     64

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     27    21    22    28

    AREA NUMBER =     65

DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =     86     85     25     92

    AREA NUMBER =     66

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     39     26     27     40

    AREA NUMBER =     67

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     74     73     86     87

    AREA NUMBER =     68

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     87     86     92     93

    AREA NUMBER =     69

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     93     92     39    106

    AREA NUMBER =     70

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     88     87     93     94

    AREA NUMBER =     71
 area set 3, end guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    196    197    206    205

    AREA NUMBER =     72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205    206    211    210

    AREA NUMBER =     73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206    207    212    211

    AREA NUMBER =     74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210    211    218    220

    AREA NUMBER =     75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148    161    158    149

    AREA NUMBER =     76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142    148    149    143

    AREA NUMBER =     77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143    149    150    144

    AREA NUMBER =     78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22    142    143     23

    AREA NUMBER =     79
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     28     22     23     29

    AREA NUMBER =     80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     29     23     24     30

    AREA NUMBER =     81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41     28     29     38

    AREA NUMBER =     82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     95     94    107    104

    AREA NUMBER =     83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     89     88     94     95

    AREA NUMBER =     84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90     89     95     96

    AREA NUMBER =     85

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     78     77     88     89

    AREA NUMBER =     86
 area set 4, corner guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    219    220    221    162

    AREA NUMBER =     87

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    159    219    162    160

    AREA NUMBER =     88

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    160    162    163    161

    AREA NUMBER =     89

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107    106     42    109

    AREA NUMBER =     90

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    106     39     40     42

    AREA NUMBER =     91

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     42     40     41     43

    AREA NUMBER =     92

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 area set 5, inner barrier

DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    222   223   224   207

    AREA NUMBER =     93

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    207   224   225   212

    AREA NUMBER =     94

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    212   225   226   218

    AREA NUMBER =     95

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    218   226   227   220

    AREA NUMBER =     96

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    220   227   228   221

    AREA NUMBER =     97

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    163   171   170   161

    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
```

```
  KEYPOINT LIST =    41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   104   115   114    96

    AREA NUMBER =    111

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    90   113   112   110

    AREA NUMBER =    113
 area set 6, outer barrier

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   223   229   230   224

    AREA NUMBER =    114

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   224   230   231   225

    AREA NUMBER =    115

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   225   231   232   226

    AREA NUMBER =    116

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   226   232   233   227

    AREA NUMBER =    117

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   227   233   234   228

    AREA NUMBER =    118

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   228   234   178   171

    AREA NUMBER =    119

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =   171   178   177   170

    AREA NUMBER =    120
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    170   177   176   169

    AREA NUMBER =    121

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    169   176   175   168

    AREA NUMBER =    122

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    168   175   174   167

    AREA NUMBER =    123

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    167   174    54    47

    AREA NUMBER =    124

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     47    54    55    48

    AREA NUMBER =    125

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     48    55    56    49

    AREA NUMBER =    126

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     49    56    57    50

    AREA NUMBER =    127

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     50    57    58    51

    AREA NUMBER =    128

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     51    58   124   117

    AREA NUMBER =    129

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    117   124   123   116

    AREA NUMBER =    130

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    116   123   122   115

    AREA NUMBER =    131

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    115   122   121   114

    AREA NUMBER =    132

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    114   121   120   113

    AREA NUMBER =    133

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    113   120   119   112

    AREA NUMBER =    134
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    229   235   236   230

    AREA NUMBER =    135

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    236   237   231   230

    AREA NUMBER =    136

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    231   237   238   232

    AREA NUMBER =    137

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    238   239   233   232

    AREA NUMBER =    138

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    239   240   234   233

    AREA NUMBER =    139

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    240   185   178   234

    AREA NUMBER =    140

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    185   184   177   178

    AREA NUMBER =    141

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    184   183   176   177

    AREA NUMBER =    142

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    176   183   182   175

    AREA NUMBER =    143

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    175   182   181   174

    AREA NUMBER =    144

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    174   181    61    54

    AREA NUMBER =    145

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     54    61    62    55

    AREA NUMBER =    146

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     55    62    63    56

    AREA NUMBER =    147

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     56    63    64    57

    AREA NUMBER =    148
```

```
 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     57    64    65    58

     AREA NUMBER =     149

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     58    65   131   124

     AREA NUMBER =     150

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    124   131   130   123

     AREA NUMBER =     151

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    123   130   129   122

     AREA NUMBER =     152

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    122   129   128   121

     AREA NUMBER =     153

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    121   128   127   120

     AREA NUMBER =     154

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    120   127   126   119

     AREA NUMBER =     155

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 DRAG ALL SELECTED AREAS
      ALONG LINES
          1,

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 1 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 2 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 3 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 4 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 5 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 6 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.940   TIME= 17:50:05
 Area 7 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.950   TIME= 17:50:05
 Area 8 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.950   TIME= 17:50:05
 Area 9 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      5.950   TIME= 17:50:05
 Area 10 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.950   TIME= 17:50:05
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.960   TIME= 17:50:05
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.970   TIME= 17:50:05
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.970   TIME= 17:50:05
Area 33 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 34 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 35 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 36 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 37 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 38 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 39 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 40 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 41 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 42 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.970 TIME= 17:50:05
Area 43 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 44 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 45 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 46 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 47 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 48 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 49 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 50 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 51 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 52 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 53 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.980 TIME= 17:50:05
Area 54 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.990 TIME= 17:50:05
Area 55 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.990 TIME= 17:50:05
Area 56 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 5.990 TIME= 17:50:05

```
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.990   TIME= 17:50:05
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.000   TIME= 17:50:05
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 80 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.010   TIME= 17:50:05
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 90 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.020   TIME= 17:50:05
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 103 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.030   TIME= 17:50:05
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 114 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 115 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 117 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 118 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.040   TIME= 17:50:05
Area 120 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 121 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 123 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 124 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 126 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
```

```
Area 127 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 129 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 130 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.050   TIME= 17:50:05
Area 131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 132 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 133 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 135 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 136 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 137 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 138 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 139 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 140 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 141 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.060   TIME= 17:50:05
Area 142 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.070   TIME= 17:50:05
Area 143 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.070   TIME= 17:50:05
Area 144 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.070   TIME= 17:50:05
Area 145 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.070   TIME= 17:50:05
Area 146 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.070   TIME= 17:50:05
Area 147 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 148 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 149 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 150 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 151 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 152 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 153 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 154 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.080   TIME= 17:50:05
Area 155 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5750     AND   4.5750
  KABS=  0.  TOLERANCE= 0.228750E-01

  155  AREAS (OF   679  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    63  AREAS (OF    679  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 483 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 486 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 490 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 493 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 496 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.450   TIME= 17:50:22
Area 500 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 503 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 506 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 510 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 513 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 517 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.460   TIME= 17:50:22
Area 520 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     15.460   TIME= 17:50:22
Area 524 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.460   TIME= 17:50:22
Area 527 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.460   TIME= 17:50:22
Area 530 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.460   TIME= 17:50:22
Area 534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.460   TIME= 17:50:22
Area 537 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 540 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 544 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 551 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 555 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 561 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 564 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 567 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 573 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.470   TIME= 17:50:22
Area 576 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 579 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 585 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 588 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 591 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.480   TIME= 17:50:22
```

Area 597 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.480 TIME= 17:50:22
Area 600 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.480 TIME= 17:50:22
Area 603 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.480 TIME= 17:50:22
Area 606 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.480 TIME= 17:50:22
Area 609 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 612 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 615 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 619 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 622 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 625 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 628 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 631 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 634 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 637 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 640 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.490 TIME= 17:50:22
Area 643 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 646 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 649 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 652 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 655 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 658 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 661 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 664 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.500 TIME= 17:50:22
Area 667 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=      15.500   TIME= 17:50:22
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.500   TIME= 17:50:22
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.500   TIME= 17:50:22
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.500   TIME= 17:50:22
Area 679 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6050     AND   4.6050
  KABS=  0.  TOLERANCE= 0.230250E-01

   63  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5550     AND   4.5550
  KABS=  0.  TOLERANCE= 0.227750E-01

  155  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.'00E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    417 USED FOR KEYPOINT(S)     609
KEYPOINT    419 USED FOR KEYPOINT(S)     610
KEYPOINT    421 USED FOR KEYPOINT(S)     611
KEYPOINT    423 USED FOR KEYPOINT(S)     546
KEYPOINT    425 USED FOR KEYPOINT(S)     628
KEYPOINT    427 USED FOR KEYPOINT(S)     630
KEYPOINT    429 USED FOR KEYPOINT(S)     584
KEYPOINT    431 USED FOR KEYPOINT(S)     612
KEYPOINT    433 USED FOR KEYPOINT(S)     615
KEYPOINT    435 USED FOR KEYPOINT(S)     616
KEYPOINT    437 USED FOR KEYPOINT(S)     619
KEYPOINT    439 USED FOR KEYPOINT(S)     620
KEYPOINT    441 USED FOR KEYPOINT(S)     621
KEYPOINT    443 USED FOR KEYPOINT(S)     602
KEYPOINT    445 USED FOR KEYPOINT(S)     633
KEYPOINT    447 USED FOR KEYPOINT(S)     632
KEYPOINT    449 USED FOR KEYPOINT(S)     580
KEYPOINT    451 USED FOR KEYPOINT(S)     623
KEYPOINT    453 USED FOR KEYPOINT(S)     626
KEYPOINT    454 USED FOR KEYPOINT(S)     625
LINE     960 USED FOR LINE(S)    1374
LINE     970 USED FOR LINE(S)    1377
LINE     975 USED FOR LINE(S)    1405
LINE     985 USED FOR LINE(S)    1410
LINE     990 USED FOR LINE(S)    1378
LINE    1000 USED FOR LINE(S)    1384
LINE    1010 USED FOR LINE(S)    1391
LINE    1020 USED FOR LINE(S)    1394
LINE    1025 USED FOR LINE(S)    1415
LINE    1035 USED FOR LINE(S)    1413
LINE    1040 USED FOR LINE(S)    1396
LINE    1046 USED FOR LINE(S)    1402
```

```
 lines tube height

LINE CONNECTS KEYPOINTS    502   509
 LINE NO.=  1374  KP1=    502  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    509  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    510   517
 LINE NO.=  1377  KP1=    510  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    517  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    518   525
 LINE NO.=  1378  KP1=    518  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    525  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    526   533
 LINE NO.=  1384  KP1=    526  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    533  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    534   541
 LINE NO.=  1391  KP1=    534  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    541  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 end lines

LINE CONNECTS KEYPOINTS    627   457
 LINE NO.=  1394  KP1=    627  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    457  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    414   606
 LINE NO.=  1396  KP1=    414  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    606  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =   955 1369 1373 1396
     (TRAVERSED IN SAME DIRECTION AS LINE   955)

    AREA NUMBER =     985

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1189 1190 1194 1374
     (TRAVERSED IN SAME DIRECTION AS LINE  1189)

    AREA NUMBER =     986

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1199 1200 1204 1377
     (TRAVERSED IN SAME DIRECTION AS LINE  1199)

    AREA NUMBER =     987

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1209 1212 1214 1378
     (TRAVERSED IN SAME DIRECTION AS LINE  1209)

    AREA NUMBER =     988

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1219 1222 1224 1384
     (TRAVERSED IN SAME DIRECTION AS LINE  1219)

    AREA NUMBER =     989

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1229 1232 1234 1391
     (TRAVERSED IN SAME DIRECTION AS LINE  1229)
```

```
    AREA NUMBER =    990

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1055 1394 1400 1404
     (TRAVERSED IN SAME DIRECTION AS LINE  1055)

    AREA NUMBER =    991

DEFINE AREA BY LIST OF LINES
     LINE LIST =   965 1375 1376
     (TRAVERSED IN SAME DIRECTION AS LINE   965)

    AREA NUMBER =    992

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1238 1242 1243 1246
     (TRAVERSED IN SAME DIRECTION AS LINE  1238)

    AREA NUMBER =    993

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1250 1254 1255 1258
     (TRAVERSED IN SAME DIRECTION AS LINE  1250)

    AREA NUMBER =    994

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1263 1266 1268 1271
     (TRAVERSED IN SAME DIRECTION AS LINE  1263)

    AREA NUMBER =    995

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1274 1278 1281 1282
     (TRAVERSED IN SAME DIRECTION AS LINE  1274)

    AREA NUMBER =    996

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1286 1290 1293 1294
     (TRAVERSED IN SAME DIRECTION AS LINE  1286)

    AREA NUMBER =    997

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1045 1397 1401
     (TRAVERSED IN SAME DIRECTION AS LINE  1045)

    AREA NUMBER =    998

DEFINE AREA BY LIST OF LINES
     LINE LIST =   980 1406 1409
     (TRAVERSED IN SAME DIRECTION AS LINE   980)

    AREA NUMBER =    999

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1299 1302 1304 1307
     (TRAVERSED IN SAME DIRECTION AS LINE  1299)

    AREA NUMBER =   1000

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1311 1314 1316 1319
     (TRAVERSED IN SAME DIRECTION AS LINE  1311)

    AREA NUMBER =   1001

DEFINE AREA BY LIST OF LINES
```

```
     LINE LIST =  1323 1326 1328 1331
     (TRAVERSED IN SAME DIRECTION AS LINE  1323)

    AREA NUMBER =   1002

 DEFINE AREA BY LIST OF LINES
     LINE LIST =  1030 1412 1416
     (TRAVERSED IN SAME DIRECTION AS LINE  1030)

    AREA NUMBER =   1003

 DEFINE AREA BY LIST OF LINES
     LINE LIST =   995 1379 1383
     (TRAVERSED IN SAME DIRECTION AS LINE   995)

    AREA NUMBER =   1004

 DEFINE AREA BY LIST OF LINES
     LINE LIST =  1005 1385 1386 1390
     (TRAVERSED IN SAME DIRECTION AS LINE  1005)

    AREA NUMBER =   1005

 DEFINE AREA BY LIST OF LINES
     LINE LIST =  1015 1392 1393
     (TRAVERSED IN SAME DIRECTION AS LINE  1015)

    AREA NUMBER =   1006

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6050     AND   4.6050
   KABS=  0.  TOLERANCE= 0.230250E-01

   177  AREAS (OF  1006  DEFINED) SELECTED BY  ASEL  COMMAND.

 DRAG ALL SELECTED AREAS
     ALONG LINES
         3,

 *** WARNING ***                          CP=     22.160   TIME= 17:50:33
 Area 684 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 688 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 692 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 696 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 700 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 704 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 708 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 712 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 716 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 720 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     22.170   TIME= 17:50:33
 Area 724 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     22.170   TIME= 17:50:33
Area 728 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 732 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 736 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 740 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 744 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 748 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 752 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 756 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 760 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 764 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 768 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.180   TIME= 17:50:33
Area 771 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 774 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 777 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 780 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 783 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 786 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 789 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 792 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 795 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 798 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 801 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.190   TIME= 17:50:33
Area 804 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 807 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 810 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 813 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 816 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 819 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 822 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 825 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 828 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 832 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 835 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.200   TIME= 17:50:33
Area 838 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 841 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 844 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 847 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 850 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 853 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 856 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 859 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 862 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 865 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 868 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 871 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 874 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
```

```
Area 877 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.210   TIME= 17:50:34
Area 880 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 883 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 886 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 889 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 892 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 893 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 894 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 895 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 896 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 897 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 898 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 899 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.220   TIME= 17:50:34
Area 900 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 901 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 902 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 903 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 904 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 905 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 906 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 907 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 908 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 909 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 910 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     22.230   TIME= 17:50:34
Area 911 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 912 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 913 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 914 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 915 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 916 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 917 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 918 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 919 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 920 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.240   TIME= 17:50:34
Area 921 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 922 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 923 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 924 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 925 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 926 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 927 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 928 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 929 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 930 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 931 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.250   TIME= 17:50:34
Area 932 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.260   TIME= 17:50:34
Area 933 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 934 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 935 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 936 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 937 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 938 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 939 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 940 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 941 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 942 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.260   TIME= 17:50:34
Area 943 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 944 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 945 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 946 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 947 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 948 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 949 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 950 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 951 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 952 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 953 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.270   TIME= 17:50:34
Area 954 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.280   TIME= 17:50:34
Area 955 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.280   TIME= 17:50:34
Area 956 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.280   TIME= 17:50:34
```

Area 957 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 958 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 959 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 960 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 961 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 962 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 963 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 964 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 965 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.280 TIME= 17:50:34
Area 966 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 967 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 968 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 969 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 970 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 971 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 972 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 973 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 974 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 975 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 976 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.290 TIME= 17:50:34
Area 977 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.300 TIME= 17:50:34
Area 978 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.300 TIME= 17:50:34
Area 979 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.300 TIME= 17:50:34
Area 980 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 981 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 982 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 983 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 984 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 985 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 986 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 987 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 988 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.300   TIME= 17:50:34
Area 989 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 990 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 991 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 992 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 993 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 994 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 17:50:34
Area 995 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 996 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 997 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 998 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 999 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 1000 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 1001 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 1002 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 17:50:34
Area 1003 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      22.320   TIME= 17:50:34
Area 1004 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.320   TIME= 17:50:34
Area 1005 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.330   TIME= 17:50:34
Area 1006 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6250     AND   4.6250
  KABS=  0.  TOLERANCE= 0.231250E-01

  177  AREAS (OF  1559  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.73095     AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00

   42  AREAS (OF  1559  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         4,

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1095 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1098 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.720   TIME= 17:50:52
Area 1122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.730   TIME= 17:50:52
Area 1125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.730   TIME= 17:50:52
Area 1128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.730   TIME= 17:50:52
Area 1131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.730   TIME= 17:50:52
Area 1134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      32.730   TIME= 17:50:52
```

Area 1137 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1140 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1143 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1146 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1149 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1152 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.730 TIME= 17:50:52
Area 1155 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1159 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1162 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1165 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1168 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1171 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1174 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1177 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1180 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1183 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1186 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1189 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.740 TIME= 17:50:52
Area 1192 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.750 TIME= 17:50:52
Area 1195 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.750 TIME= 17:50:52
Area 1198 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.750 TIME= 17:50:52
Area 1201 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.750 TIME= 17:50:52
Area 1204 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 32.750 TIME= 17:50:52
Area 1207 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     32.750   TIME= 17:50:52
Area 1210 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.750   TIME= 17:50:52
Area 1213 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.750   TIME= 17:50:52
Area 1216 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.750   TIME= 17:50:52
Area 1219 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6250     AND   4.6250
  KABS=  0.  TOLERANCE= 0.231250E-01

  326  AREAS (OF  1708  DEFINED) SELECTED BY  ASEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5950     AND   4.5950
  KABS=  0.  TOLERANCE= 0.229750E-01

  177  AREAS (OF  1708  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.73095
  KABS=  0.  TOLERANCE= 0.000000E+00

  135  AREAS (OF  1708  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.300E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    814 USED FOR KEYPOINT(S)     881
KEYPOINT    817 USED FOR KEYPOINT(S)     882
KEYPOINT    819 USED FOR KEYPOINT(S)     884
KEYPOINT    821 USED FOR KEYPOINT(S)     886
KEYPOINT    823 USED FOR KEYPOINT(S)     888
KEYPOINT    825 USED FOR KEYPOINT(S)     890
KEYPOINT    827 USED FOR KEYPOINT(S)     892
KEYPOINT    829 USED FOR KEYPOINT(S)     894
KEYPOINT    831 USED FOR KEYPOINT(S)     896
KEYPOINT    833 USED FOR KEYPOINT(S)     898
KEYPOINT    835 USED FOR KEYPOINT(S)     900
KEYPOINT    837 USED FOR KEYPOINT(S)     902
KEYPOINT    839 USED FOR KEYPOINT(S)     904
KEYPOINT    841 USED FOR KEYPOINT(S)     906
KEYPOINT    843 USED FOR KEYPOINT(S)     908
KEYPOINT    845 USED FOR KEYPOINT(S)     910
KEYPOINT    847 USED FOR KEYPOINT(S)     912
KEYPOINT    849 USED FOR KEYPOINT(S)     914
KEYPOINT    851 USED FOR KEYPOINT(S)     916
KEYPOINT    853 USED FOR KEYPOINT(S)     918
KEYPOINT    855 USED FOR KEYPOINT(S)     921
KEYPOINT    857 USED FOR KEYPOINT(S)     922
LINE   1995 USED FOR LINE(S)   2162
LINE   2000 USED FOR LINE(S)   2165
LINE   2005 USED FOR LINE(S)   2168
LINE   2010 USED FOR LINE(S)   2171
LINE   2015 USED FOR LINE(S)   2174
LINE   2020 USED FOR LINE(S)   2177
LINE   2025 USED FOR LINE(S)   2180
LINE   2030 USED FOR LINE(S)   2183
LINE   2035 USED FOR LINE(S)   2186
LINE   2040 USED FOR LINE(S)   2189
LINE   2045 USED FOR LINE(S)   2192
```

```
 LINE    2050 USED FOR LINE(S)    2195
 LINE    2055 USED FOR LINE(S)    2198
 LINE    2060 USED FOR LINE(S)    2201
 LINE    2065 USED FOR LINE(S)    2204
 LINE    2070 USED FOR LINE(S)    2207
 LINE    2075 USED FOR LINE(S)    2210
 LINE    2080 USED FOR LINE(S)    2213
 LINE    2085 USED FOR LINE(S)    2216
 LINE    2090 USED FOR LINE(S)    2220
 LINE    2095 USED FOR LINE(S)    2222

 SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6550     AND   4.6550
   KABS=  0.  TOLERANCE= 0.232750E-01

   177  AREAS (OF  1843  DEFINED) SELECTED BY  ASEL  COMMAND.

 DRAG ALL SELECTED AREAS
      ALONG LINES
          5,

 *** WARNING ***                          CP=     39.200   TIME= 17:51:03
 Area 1564 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.200   TIME= 17:51:03
 Area 1568 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.200   TIME= 17:51:03
 Area 1572 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.200   TIME= 17:51:03
 Area 1576 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1580 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1584 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1588 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1592 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1596 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1600 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1604 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1608 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.210   TIME= 17:51:03
 Area 1612 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.220   TIME= 17:51:03
 Area 1616 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.220   TIME= 17:51:03
 Area 1620 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.220   TIME= 17:51:03
 Area 1624 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=     39.220   TIME= 17:51:03
 Area 1628 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1632 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1636 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1640 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1644 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1648 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1651 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.220 TIME= 17:51:03
Area 1654 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1657 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1660 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1663 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1666 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1669 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1672 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1675 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1678 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1681 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1684 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1687 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.230 TIME= 17:51:03
Area 1690 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.240 TIME= 17:51:03
Area 1693 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.240 TIME= 17:51:03
Area 1696 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.240 TIME= 17:51:03
Area 1699 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.240 TIME= 17:51:03
Area 1702 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1708 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1709 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1710 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1711 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1712 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1713 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.240   TIME= 17:51:03
Area 1714 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1715 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1716 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1717 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1718 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1719 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1720 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1721 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1722 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1723 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1724 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.250   TIME= 17:51:03
Area 1725 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.260   TIME= 17:51:03
Area 1726 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.260   TIME= 17:51:03
Area 1727 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.260   TIME= 17:51:03
Area 1728 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.260   TIME= 17:51:03
Area 1729 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.260   TIME= 17:51:03
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Area 1730 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1731 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1732 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1733 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1734 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1735 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1736 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.260 TIME= 17:51:03
Area 1737 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1738 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1739 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1740 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1741 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1742 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.270 TIME= 17:51:03
Area 1743 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1744 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1745 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1746 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1747 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1748 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1749 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1750 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1751 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1752 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.280 TIME= 17:51:03
Area 1753 is not meshed. Volume will be generated without elements.

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*** WARNING ***                          CP=     39.280   TIME= 17:51:03
Area 1754 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1755 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1756 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1757 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1758 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1759 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1760 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1761 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1762 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1763 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1764 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.290   TIME= 17:51:03
Area 1765 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1766 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1767 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1768 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1769 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1770 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1771 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1772 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1773 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1774 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1775 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1776 is not meshed.  Volume will be generated without elements.
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*** WARNING ***                          CP=     39.300   TIME= 17:51:03
Area 1777 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1778 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1779 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1780 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1781 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1782 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1783 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1784 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1785 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1786 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1787 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.310   TIME= 17:51:03
Area 1788 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1789 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1790 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1791 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1792 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1793 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1794 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1795 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1796 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1797 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1798 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.320   TIME= 17:51:03
Area 1799 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.330   TIME= 17:51:03
```

Area 1800 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1801 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1802 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1803 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1804 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1805 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1806 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1807 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1808 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1809 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.330 TIME= 17:51:03
Area 1810 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1811 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1812 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1813 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1814 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1815 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1816 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1817 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1818 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1819 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1820 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1821 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.340 TIME= 17:51:03
Area 1822 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 39.350 TIME= 17:51:03
Area 1823 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1824 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1825 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1826 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1827 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1828 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1829 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1830 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1831 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1832 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1833 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.350   TIME= 17:51:03
Area 1834 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1835 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1836 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1837 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1838 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1839 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1840 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1841 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1842 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     39.360   TIME= 17:51:03
Area 1843 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.7500     AND   4.7500
  KABS=  0.  TOLERANCE= 0.237500E-01

  177  AREAS (OF  2396  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.77095     AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00
```

```
   21  AREAS (OF  2396  DEFINED) SELECTED BY  ASEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 DRAG ALL SELECTED AREAS
      ALONG LINES
          6,

 *** WARNING ***                          CP=      49.980   TIME= 17:51:22
 Area 1932 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1935 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1938 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1941 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1944 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1947 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1950 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1953 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1956 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1959 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1962 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      49.990   TIME= 17:51:22
 Area 1965 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1968 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1971 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1974 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1977 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1980 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1983 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1986 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
 Area 1989 is not meshed.  Volume will be generated without elements.

 *** WARNING ***                          CP=      50.000   TIME= 17:51:22
```

```
Area 1992 is not meshed.  Volume will be generated without elements.
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=  3114  KP1=    195  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    194  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=  3115  KP1=    191  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    190  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=  3116  KP1=    187  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     68  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=  3117  KP1=     71  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     72  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=  3118  KP1=     75  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     76  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=  3119  KP1=    222  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    197  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=  3120  KP1=     78  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    110  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =    10  115  277 3119
     (TRAVERSED IN SAME DIRECTION AS LINE    10)

    AREA NUMBER =   2482

DEFINE AREA BY LIST OF LINES
     LINE LIST =    12   13   68 3114
     (TRAVERSED IN SAME DIRECTION AS LINE    12)

    AREA NUMBER =   2483

DEFINE AREA BY LIST OF LINES
     LINE LIST =    16   17   75 3115
     (TRAVERSED IN SAME DIRECTION AS LINE    16)

    AREA NUMBER =   2484

DEFINE AREA BY LIST OF LINES
     LINE LIST =    20   21   85 3116
     (TRAVERSED IN SAME DIRECTION AS LINE    20)

    AREA NUMBER =   2485

DEFINE AREA BY LIST OF LINES
     LINE LIST =    24   25   96 3117
     (TRAVERSED IN SAME DIRECTION AS LINE    24)

    AREA NUMBER =   2486

DEFINE AREA BY LIST OF LINES
     LINE LIST =    28   29  107 3118
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE    28)

    AREA NUMBER =   2487

DEFINE AREA BY LIST OF LINES
     LINE LIST =    31  122  309 3120
     (TRAVERSED IN SAME DIRECTION AS LINE    31)

    AREA NUMBER =   2488

DEFINE AREA BY LIST OF LINES
     LINE LIST =    32  116  281
     (TRAVERSED IN SAME DIRECTION AS LINE    32)

    AREA NUMBER =   2489

DEFINE AREA BY LIST OF LINES
     LINE LIST =    34   35   71   72
     (TRAVERSED IN SAME DIRECTION AS LINE    34)

    AREA NUMBER =   2490

DEFINE AREA BY LIST OF LINES
     LINE LIST =    38   39   78   79
     (TRAVERSED IN SAME DIRECTION AS LINE    38)

    AREA NUMBER =   2491

DEFINE AREA BY LIST OF LINES
     LINE LIST =    42   43   88   89
     (TRAVERSED IN SAME DIRECTION AS LINE    42)

    AREA NUMBER =   2492

DEFINE AREA BY LIST OF LINES
     LINE LIST =    46   47   99  100
     (TRAVERSED IN SAME DIRECTION AS LINE    46)

    AREA NUMBER =   2493

DEFINE AREA BY LIST OF LINES
     LINE LIST =    50   51  110  111
     (TRAVERSED IN SAME DIRECTION AS LINE    50)

    AREA NUMBER =   2494

DEFINE AREA BY LIST OF LINES
     LINE LIST =    53  121  305
     (TRAVERSED IN SAME DIRECTION AS LINE    53)

    AREA NUMBER =   2495

DEFINE AREA BY LIST OF LINES
     LINE LIST =    54   74  285
     (TRAVERSED IN SAME DIRECTION AS LINE    54)

    AREA NUMBER =   2496

DEFINE AREA BY LIST OF LINES
     LINE LIST =    56   57   82   83
     (TRAVERSED IN SAME DIRECTION AS LINE    56)

    AREA NUMBER =   2497

DEFINE AREA BY LIST OF LINES
     LINE LIST =    60   61   92   93
     (TRAVERSED IN SAME DIRECTION AS LINE    60)

    AREA NUMBER =   2498
```

```
DEFINE AREA BY LIST OF LINES
     LINE LIST =    64   65  103  104
     (TRAVERSED IN SAME DIRECTION AS LINE    64)

    AREA NUMBER =   2499

DEFINE AREA BY LIST OF LINES
     LINE LIST =    67  113  301
     (TRAVERSED IN SAME DIRECTION AS LINE    67)

    AREA NUMBER =   2500

DEFINE AREA BY LIST OF LINES
     LINE LIST =   114  117  289
     (TRAVERSED IN SAME DIRECTION AS LINE   114)

    AREA NUMBER =   2501

DEFINE AREA BY LIST OF LINES
     LINE LIST =    95  118  119  293
     (TRAVERSED IN SAME DIRECTION AS LINE    95)

    AREA NUMBER =   2502

DEFINE AREA BY LIST OF LINES
     LINE LIST =   106  120  297
     (TRAVERSED IN SAME DIRECTION AS LINE   106)

    AREA NUMBER =   2503

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

  177  AREAS (OF  2503  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         7,

*** WARNING ***                         CP=     52.520   TIME= 17:51:26
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.530   TIME= 17:51:26
```

Area 11 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.530 TIME= 17:51:26
Area 12 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.530 TIME= 17:51:26
Area 13 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 14 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 15 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 16 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 17 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 18 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 19 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 20 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 21 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 22 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 23 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.540 TIME= 17:51:26
Area 24 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 25 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 26 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 27 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 28 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 29 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 30 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 31 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 32 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 33 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 34 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 35 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.550 TIME= 17:51:26
Area 36 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 37 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 38 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 39 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 40 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 41 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 42 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 43 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 44 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 45 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 46 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.560 TIME= 17:51:26
Area 47 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 48 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 49 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 50 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 51 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 52 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 53 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 54 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 55 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 56 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.570 TIME= 17:51:26
Area 57 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     52.570   TIME= 17:51:26
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.580   TIME= 17:51:26
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.590   TIME= 17:51:26
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.600   TIME= 17:51:26
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.600   TIME= 17:51:26
```

Area 81 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 82 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 83 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 84 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 85 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 86 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 87 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 88 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 89 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 90 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.600 TIME= 17:51:26
Area 91 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 92 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 93 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 94 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 95 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 96 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 97 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 98 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 99 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 100 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 101 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.610 TIME= 17:51:26
Area 102 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.620 TIME= 17:51:26
Area 103 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.620 TIME= 17:51:26
Area 104 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.620   TIME= 17:51:26
Area 113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 114 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 115 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 117 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 118 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 120 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 121 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 123 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 124 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.630   TIME= 17:51:26
Area 125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.640   TIME= 17:51:26
Area 126 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     52.640   TIME= 17:51:26
Area 127 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 129 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 130 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 132 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 133 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.640   TIME= 17:51:26
Area 135 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:26
Area 136 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:26
Area 137 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:26
Area 138 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:26
Area 139 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 140 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 141 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 142 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 143 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 144 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 145 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 146 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 147 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 148 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.650   TIME= 17:51:27
Area 149 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.660   TIME= 17:51:27
Area 150 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.660   TIME= 17:51:27
```

Area 151 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 152 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 153 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 154 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 155 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 2482 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 2483 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 2484 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.660 TIME= 17:51:27
Area 2485 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2486 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2487 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2488 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2489 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2490 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2491 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2492 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2493 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2494 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.670 TIME= 17:51:27
Area 2495 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.680 TIME= 17:51:27
Area 2496 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.680 TIME= 17:51:27
Area 2497 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.680 TIME= 17:51:27
Area 2498 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.680 TIME= 17:51:27
Area 2499 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 52.680 TIME= 17:51:27
Area 2500 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     52.680   TIME= 17:51:27
Area 2501 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.680   TIME= 17:51:27
Area 2502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     52.680   TIME= 17:51:27
Area 2503 is not meshed.  Volume will be generated without elements.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.25000E-01 AND -0.25000E-01
  KABS=  0.  TOLERANCE= 0.125000E-03

  177  AREAS (OF  3056  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         8,

*** WARNING ***                         CP=     63.730   TIME= 17:51:45
Area 2508 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.730   TIME= 17:51:45
Area 2512 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.730   TIME= 17:51:45
Area 2516 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2521 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2525 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2529 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2542 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2551 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2555 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2560 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.740   TIME= 17:51:45
Area 2564 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.750   TIME= 17:51:45
Area 2568 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.750   TIME= 17:51:45
Area 2573 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.750   TIME= 17:51:45
```

Area 2577 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2581 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2584 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2589 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2593 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2597 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2600 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2605 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2609 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.750 TIME= 17:51:45
Area 2613 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2616 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2621 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2625 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2629 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2632 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2637 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2641 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2645 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2648 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2653 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.760 TIME= 17:51:45
Area 2657 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.770 TIME= 17:51:45
Area 2661 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.770 TIME= 17:51:45
Area 2664 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.770 TIME= 17:51:45
Area 2669 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2677 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2680 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2685 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2689 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.770   TIME= 17:51:45
Area 2699 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2709 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2712 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2715 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2718 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2720 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2723 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2725 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2727 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.780   TIME= 17:51:45
Area 2729 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.790   TIME= 17:51:45
Area 2732 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.790   TIME= 17:51:45
Area 2735 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.790   TIME= 17:51:45
Area 2737 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2740 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2742 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2744 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2746 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2749 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2752 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2754 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.790 TIME= 17:51:45
Area 2756 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2760 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2763 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2767 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2770 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2774 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2777 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2781 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2784 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2787 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2791 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.800 TIME= 17:51:45
Area 2794 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.810 TIME= 17:51:45
Area 2798 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.810 TIME= 17:51:45
Area 2801 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.810 TIME= 17:51:45
Area 2805 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.810 TIME= 17:51:45
Area 2808 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.810 TIME= 17:51:45

```
Area 2812 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.810   TIME= 17:51:45
Area 2814 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.810   TIME= 17:51:45
Area 2817 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.810   TIME= 17:51:45
Area 2821 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.810   TIME= 17:51:45
Area 2823 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.810   TIME= 17:51:45
Area 2826 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2831 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2834 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2838 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2841 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2844 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2848 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2851 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2854 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.820   TIME= 17:51:45
Area 2858 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2861 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2865 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2868 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2872 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2875 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2878 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2882 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2885 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.830   TIME= 17:51:45
Area 2888 is not meshed.  Volume will be generated without elements.
```

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*** WARNING ***                          CP=     63.830   TIME= 17:51:45
Area 2892 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.830   TIME= 17:51:45
Area 2895 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.830   TIME= 17:51:45
Area 2899 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2903 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2906 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2909 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2912 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2915 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2918 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2921 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2924 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2927 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2930 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2933 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.840   TIME= 17:51:45
Area 2936 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2939 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2942 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2945 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2948 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2951 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2954 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2957 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.850   TIME= 17:51:45
Area 2960 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 63.850 TIME= 17:51:45
Area 2963 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.850 TIME= 17:51:45
Area 2967 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:45
Area 2970 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:45
Area 2973 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:45
Area 2976 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:45
Area 2979 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:45
Area 2982 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 2985 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 2988 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 2991 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 2994 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 2997 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3000 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3003 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3006 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3009 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3012 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.860 TIME= 17:51:46
Area 3015 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46
Area 3018 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46
Area 3021 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46
Area 3024 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46
Area 3027 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46
Area 3029 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.870 TIME= 17:51:46

```
Area 3031 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.870   TIME= 17:51:46
Area 3033 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.870   TIME= 17:51:46
Area 3035 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.870   TIME= 17:51:46
Area 3037 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.870   TIME= 17:51:46
Area 3039 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.870   TIME= 17:51:46
Area 3041 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3042 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3043 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3044 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3045 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3046 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3047 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3048 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3049 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3050 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3051 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.880   TIME= 17:51:46
Area 3052 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.890   TIME= 17:51:46
Area 3053 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.890   TIME= 17:51:46
Area 3054 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.890   TIME= 17:51:46
Area 3055 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.890   TIME= 17:51:46
Area 3056 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.13500     AND -0.13500
  KABS=  0.  TOLERANCE= 0.675000E-03

  177  AREAS (OF  3609  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.77095     AND  0.83095
```

```
  KABS=  0.  TOLERANCE= 0.000000E+00

   21  AREAS (OF  3609  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         9,

*** WARNING ***                          CP=     74.960   TIME= 17:52:05
Area 3520 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.960   TIME= 17:52:05
Area 3523 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.960   TIME= 17:52:05
Area 3526 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3529 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3532 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3535 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3541 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3544 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3550 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3553 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.970   TIME= 17:52:05
Area 3556 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3559 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3562 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3565 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3568 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3571 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     74.980   TIME= 17:52:05
Area 3577 is not meshed.  Volume will be generated without elements.
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*** WARNING ***                         CP=     74.980   TIME= 17:52:05
Area 3580 is not meshed.  Volume will be generated without elements.

 Mesh Volumes

 Mesh the CS Tubes


SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       47 STEP        1

   47  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      1

MATERIAL NUMBER SET TO     1

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

NUMBER OF VOLUMES MESHED   =     47
MAXIMUM NODE NUMBER        =   6176
MAXIMUM ELEMENT NUMBER     =   2820
 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     89.460   TIME= 17:52:30
Meshing of volume 50 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
         2941    2942    2943    2944    2945    2946    2947    2948
         2949    2950    2951    2952    2953    2954    2955


*** WARNING ***                         CP=     90.450   TIME= 17:52:31
Meshing of volume 55 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    55 WITH EXCESSIVE ASPECT RATIO ***
         3196    3197    3198    3199    3200    3201    3202    3203
         3204    3205    3206    3207    3208    3209    3210


*** WARNING ***                         CP=     90.790   TIME= 17:52:32
Meshing of volume 57 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    57 WITH EXCESSIVE ASPECT RATIO ***
         3271    3272    3273    3274    3275    3276    3277    3278
         3279    3280    3281    3282    3283    3284    3285


*** WARNING ***                         CP=     91.780   TIME= 17:52:34
Meshing of volume 62 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    62 WITH EXCESSIVE ASPECT RATIO ***
         3526    3527    3528    3529    3530    3531    3532    3533
         3534    3535    3536    3537    3538    3539    3540
```

```
*** WARNING ***                                 CP=     92.120   TIME= 17:52:34
Meshing of volume 64 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    64 WITH EXCESSIVE ASPECT RATIO ***
         3601    3602    3603    3604    3605    3606    3607    3608
         3609    3610    3611    3612    3613    3614    3615


*** WARNING ***                                 CP=     93.160   TIME= 17:52:36
Meshing of volume 69 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
         3856    3857    3858    3859    3860    3861    3862    3863
         3864    3865    3866    3867    3868    3869    3870


NUMBER OF VOLUMES MESHED    =     24
MAXIMUM NODE NUMBER         =   6176
MAXIMUM ELEMENT NUMBER      =   3990
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP       1

   15  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                                 CP=     94.280   TIME= 17:52:38
Meshing of volume 73 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    73 WITH EXCESSIVE ASPECT RATIO ***
         4051    4052    4053    4054    4055    4056    4057    4058
         4059    4060    4061    4062    4063    4064    4065


*** WARNING ***                                 CP=     94.590   TIME= 17:52:39
Volume 75 area 75 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                                 CP=     94.590   TIME= 17:52:39
Volume 75 area 422 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                                 CP=     94.740   TIME= 17:52:39
Meshing of volume 75 produced 30 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    75 WITH EXCESSIVE DISTORTION ***
         4156    4157    4158    4159    4160    4161    4162    4163
         4164    4165    4166    4167    4168    4169    4170    4171
         4172    4173    4174    4175    4176    4177    4178    4179
         4180    4181    4182    4183    4184    4185


*** WARNING ***                                 CP=     94.830   TIME= 17:52:39
Volume 76 area 76 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                                 CP=     94.840   TIME= 17:52:39
Volume 76 area 426 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.
```

```
*** WARNING ***                         CP=     94.980   TIME= 17:52:39
Meshing of volume 76 produced 30 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    76 WITH EXCESSIVE DISTORTION ***
         4186    4187    4190    4191    4194    4195    4198    4199
         4202    4203    4206    4207    4210    4211    4214    4215
         4218    4219    4222    4223    4226    4227    4230    4231
         4234    4235    4238    4239    4242    4243


*** WARNING ***                         CP=     95.090   TIME= 17:52:40
Meshing of volume 77 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    77 WITH EXCESSIVE ASPECT RATIO ***
         4246    4247    4248    4249    4250    4251    4252    4253
         4254    4255    4256    4257    4258    4259    4260


*** WARNING ***                         CP=     95.640   TIME= 17:52:41
Meshing of volume 80 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    80 WITH EXCESSIVE ASPECT RATIO ***
         4381    4382    4383    4384    4385    4386    4387    4388
         4389    4390    4391    4392    4393    4394    4395


*** WARNING ***                         CP=     95.930   TIME= 17:52:41
Volume 82 area 82 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     95.940   TIME= 17:52:41
Volume 82 area 446 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     96.080   TIME= 17:52:41
Meshing of volume 82 produced 30 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    82 WITH EXCESSIVE DISTORTION ***
         4458    4459    4462    4463    4466    4467    4470    4471
         4474    4475    4478    4479    4482    4483    4486    4487
         4490    4491    4494    4495    4498    4499    4502    4503
         4506    4507    4510    4511    4514    4515


*** WARNING ***                         CP=     96.170   TIME= 17:52:41
Volume 83 area 83 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     96.180   TIME= 17:52:41
Volume 83 area 450 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     96.330   TIME= 17:52:42
Meshing of volume 83 produced 30 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    83 WITH EXCESSIVE DISTORTION ***
         4546    4547    4548    4549    4550    4551    4552    4553
         4554    4555    4556    4557    4558    4559    4560    4561
         4562    4563    4564    4565    4566    4567    4568    4569
         4570    4571    4572    4573    4574    4575


*** WARNING ***                         CP=     96.440   TIME= 17:52:42
Meshing of volume 84 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         4576    4577    4578    4579    4580    4581    4582    4583
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        4584    4585    4586    4587    4588    4589    4590


NUMBER OF VOLUMES MESHED    =      15
MAXIMUM NODE NUMBER         =    7248
MAXIMUM ELEMENT NUMBER      =    4710
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP        1

    6  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     97.350   TIME= 17:52:44
Meshing of volume 88 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
        4771    4772    4773    4774    4775    4776    4777    4778
        4779    4780    4781    4782    4783    4784    4785


*** WARNING ***                          CP=     97.920   TIME= 17:52:45
Meshing of volume 91 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
        4906    4907    4908    4909    4910    4911    4912    4913
        4914    4915    4916    4917    4918    4919    4920


NUMBER OF VOLUMES MESHED    =      6
MAXIMUM NODE NUMBER         =   7536
MAXIMUM ELEMENT NUMBER      =   4980
 Mesh Inner Barrier

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.25000E-01 AND   4.6100
  KABS=  0.  TOLERANCE= 0.000000E+00

  572  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.73095
  KABS=  0.  TOLERANCE= 0.000000E+00

  404  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   312  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      5

MATERIAL NUMBER SET TO     5

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** NOTE ***                             CP=    117.070   TIME= 17:53:22
Page file used.
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*** WARNING *** CP= 121.050 TIME= 17:53:29
Volume 356 area 967 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.060 TIME= 17:53:29
Volume 356 area 1484 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.080 TIME= 17:53:29
Meshing of volume 356 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 356 WITH EXCESSIVE DISTORTION ***
6890 6891

*** WARNING *** CP= 121.150 TIME= 17:53:29
Volume 357 area 968 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.160 TIME= 17:53:29
Volume 357 area 1487 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.180 TIME= 17:53:29
Meshing of volume 357 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 357 WITH EXCESSIVE DISTORTION ***
6892 6893

*** WARNING *** CP= 121.600 TIME= 17:53:30
Volume 363 area 974 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.610 TIME= 17:53:30
Volume 363 area 1504 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.630 TIME= 17:53:30
Meshing of volume 363 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 363 WITH EXCESSIVE DISTORTION ***
6912 6913

*** WARNING *** CP= 121.690 TIME= 17:53:30
Volume 364 area 975 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.710 TIME= 17:53:30
Volume 364 area 1507 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 121.730 TIME= 17:53:30
Meshing of volume 364 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 364 WITH EXCESSIVE DISTORTION ***
6916 6917

*** WARNING *** CP= 123.100 TIME= 17:53:32
Volume 381 area 992 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 123.120 TIME= 17:53:33
Volume 381 area 1545 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 123.160 TIME= 17:53:33
Meshing of volume 381 produced 7 elements with excessive distortion.

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     *** LIST OF ELEMENTS IN VOLUME   381 WITH EXCESSIVE DISTORTION ***
         7057    7058    7059    7060    7062    7064    7066


*** WARNING ***                          CP=    123.660   TIME= 17:53:34
Volume 387 area 998 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.680   TIME= 17:53:34
Volume 387 area 1551 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.720   TIME= 17:53:34
Meshing of volume 387 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   387 WITH EXCESSIVE DISTORTION ***
         7150    7153    7154    7157    7158    7159    7160


*** WARNING ***                          CP=    123.830   TIME= 17:53:34
Meshing of volume 388 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   388 WITH EXCESSIVE DISTORTION ***
         7166


*** WARNING ***                          CP=    124.180   TIME= 17:53:35
Meshing of volume 392 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   392 WITH EXCESSIVE DISTORTION ***
         7226


*** WARNING ***                          CP=    124.200   TIME= 17:53:35
Volume 393 area 1004 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    124.220   TIME= 17:53:35
Volume 393 area 1557 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    124.260   TIME= 17:53:35
Meshing of volume 393 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   393 WITH EXCESSIVE DISTORTION ***
         7234    7237    7238    7241    7242    7243    7244


*** WARNING ***                          CP=    124.380   TIME= 17:53:35
Volume 395 area 1006 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    124.400   TIME= 17:53:35
Volume 395 area 1559 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    124.460   TIME= 17:53:35
Meshing of volume 395 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   395 WITH EXCESSIVE DISTORTION ***
         7261    7262    7263    7264    7266    7268    7270


*** WARNING ***                          CP=    130.280   TIME= 17:53:46
Volume 710 area 75 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    130.290   TIME= 17:53:46
Volume 710 area 2770 has a corner angle of 150 degrees.  This is not
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recommended for hexahedral elements.

*** WARNING *** CP= 130.320 TIME= 17:53:46
Meshing of volume 710 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 710 WITH EXCESSIVE DISTORTION ***
7550 7551

*** WARNING *** CP= 130.370 TIME= 17:53:46
Volume 711 area 76 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.380 TIME= 17:53:46
Volume 711 area 2774 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.400 TIME= 17:53:46
Meshing of volume 711 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 711 WITH EXCESSIVE DISTORTION ***
7552 7553

*** WARNING *** CP= 130.750 TIME= 17:53:47
Volume 717 area 82 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.760 TIME= 17:53:47
Volume 717 area 2794 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.780 TIME= 17:53:47
Meshing of volume 717 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 717 WITH EXCESSIVE DISTORTION ***
7572 7573

*** WARNING *** CP= 130.830 TIME= 17:53:47
Volume 718 area 83 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.840 TIME= 17:53:47
Volume 718 area 2798 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 130.870 TIME= 17:53:47
Meshing of volume 718 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 718 WITH EXCESSIVE DISTORTION ***
7576 7577

*** WARNING *** CP= 134.010 TIME= 17:53:52
Volume 798 area 2489 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 134.030 TIME= 17:53:52
Volume 798 area 3042 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 134.070 TIME= 17:53:52
Meshing of volume 798 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 798 WITH EXCESSIVE DISTORTION ***
7813 7814 7817 7818 7819 7820 7822

*** WARNING *** CP= 134.560 TIME= 17:53:53

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 Volume 804 area 2495 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    134.580   TIME= 17:53:53
Volume 804 area 3048 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    134.620   TIME= 17:53:53
Meshing of volume 804 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   804 WITH EXCESSIVE DISTORTION ***
         7906    7908    7910    7913    7914    7915    7916


*** WARNING ***                          CP=    134.700   TIME= 17:53:53
Meshing of volume 805 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   805 WITH EXCESSIVE DISTORTION ***
         7918


*** WARNING ***                          CP=    135.060   TIME= 17:53:54
Meshing of volume 809 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   809 WITH EXCESSIVE DISTORTION ***
         7978


*** WARNING ***                          CP=    135.100   TIME= 17:53:54
Volume 810 area 2501 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    135.120   TIME= 17:53:54
Volume 810 area 3054 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    135.160   TIME= 17:53:54
Meshing of volume 810 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   810 WITH EXCESSIVE DISTORTION ***
         7989    7990    7991    7992    7994    7996    7998


*** WARNING ***                          CP=    135.280   TIME= 17:53:54
Volume 812 area 2503 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    135.290   TIME= 17:53:54
Volume 812 area 3056 has a corner angle of 29 degrees.  This is not
  recommended for hexahedral elements.

*** WARNING ***                          CP=    135.340   TIME= 17:53:54
Meshing of volume 812 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   812 WITH EXCESSIVE DISTORTION ***
         8017    8018    8021    8022    8023    8024    8026


NUMBER OF VOLUMES MESHED    =     312
MAXIMUM NODE NUMBER         =   12190
MAXIMUM ELEMENT NUMBER      =    8028
 Mesh Lower Outer Barrier and Lids

INVERT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      1010 STEP         1

  698  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO        92 STEP         1
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   606  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

 UNSELECT      FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.73095      AND  0.83095
   KABS=  0.  TOLERANCE= 0.000000E+00

    270  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

 ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y      BETWEEN -90.000      AND   5.0000
   KABS=  0.  TOLERANCE= 0.000000E+00

   666  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT      FOR ITEM=VOLU COMPONENT=
  IN RANGE        1 TO        92 STEP         1

    616  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

 UNSELECT      FOR ITEM=TYPE COMPONENT=
  IN RANGE        5 TO         5 STEP         1

    446  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

 ELEMENT TYPE SET TO      6

 MATERIAL NUMBER SET TO     6

 GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

 *** WARNING ***                          CP=    166.060   TIME= 17:54:49
 Volume 575 area 1804 has a corner angle of 150 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.070   TIME= 17:54:49
 Volume 575 area 2321 has a corner angle of 150 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.090   TIME= 17:54:49
 Meshing of volume 575 produced 2 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   575 WITH EXCESSIVE DISTORTION ***
         10378   10379


 *** WARNING ***                          CP=    166.130   TIME= 17:54:49
 Volume 576 area 1805 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.140   TIME= 17:54:49
 Volume 576 area 2324 has a corner angle of 30 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.160   TIME= 17:54:49
 Meshing of volume 576 produced 2 elements with excessive distortion.

      *** LIST OF ELEMENTS IN VOLUME   576 WITH EXCESSIVE DISTORTION ***
         10380   10381


 *** WARNING ***                          CP=    166.520   TIME= 17:54:50
 Volume 582 area 1811 has a corner angle of 150 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.530   TIME= 17:54:50
 Volume 582 area 2341 has a corner angle of 150 degrees.  This is not
  recommended for hexahedral elements.

 *** WARNING ***                          CP=    166.550   TIME= 17:54:50
```

Meshing of volume 582 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 582 WITH EXCESSIVE DISTORTION ***
10400 10401

*** WARNING *** CP= 166.610 TIME= 17:54:50
Volume 583 area 1812 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 166.620 TIME= 17:54:50
Volume 583 area 2344 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 166.640 TIME= 17:54:50
Meshing of volume 583 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 583 WITH EXCESSIVE DISTORTION ***
10404 10405

*** WARNING *** CP= 167.950 TIME= 17:54:52
Volume 600 area 1829 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 167.970 TIME= 17:54:52
Volume 600 area 2382 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.000 TIME= 17:54:52
Meshing of volume 600 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 600 WITH EXCESSIVE DISTORTION ***
10545 10546 10547 10548 10550 10552 10554

*** WARNING *** CP= 168.500 TIME= 17:54:53
Volume 606 area 1835 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.510 TIME= 17:54:53
Volume 606 area 2388 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.560 TIME= 17:54:53
Meshing of volume 606 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 606 WITH EXCESSIVE DISTORTION ***
10638 10641 10642 10645 10646 10647 10648

*** WARNING *** CP= 168.630 TIME= 17:54:53
Meshing of volume 607 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 607 WITH EXCESSIVE DISTORTION ***
10654

*** WARNING *** CP= 169.010 TIME= 17:54:54
Meshing of volume 611 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 611 WITH EXCESSIVE DISTORTION ***
10714

*** WARNING *** CP= 169.030 TIME= 17:54:54
Volume 612 area 1841 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 169.050 TIME= 17:54:54

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Volume 612 area 2394 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     169.080   TIME= 17:54:54
Meshing of volume 612 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   612 WITH EXCESSIVE DISTORTION ***
        10722   10725   10726   10729   10730   10731   10732


*** WARNING ***                          CP=     169.200   TIME= 17:54:54
Volume 614 area 1843 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     169.220   TIME= 17:54:54
Volume 614 area 2396 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     169.270   TIME= 17:54:55
Meshing of volume 614 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   614 WITH EXCESSIVE DISTORTION ***
        10749   10750   10751   10752   10754   10756   10758


*** WARNING ***                          CP=     177.590   TIME= 17:55:09
Volume 887 area 2770 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     177.600   TIME= 17:55:09
Volume 887 area 3323 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     177.620   TIME= 17:55:09
Meshing of volume 887 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   887 WITH EXCESSIVE DISTORTION ***
        11194   11195


*** WARNING ***                          CP=     177.670   TIME= 17:55:09
Volume 888 area 2774 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     177.670   TIME= 17:55:09
Volume 888 area 3327 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     177.690   TIME= 17:55:09
Meshing of volume 888 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   888 WITH EXCESSIVE DISTORTION ***
        11196   11197


*** WARNING ***                          CP=     178.060   TIME= 17:55:09
Volume 894 area 2794 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     178.070   TIME= 17:55:09
Volume 894 area 3347 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     178.100   TIME= 17:55:09
Meshing of volume 894 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   894 WITH EXCESSIVE DISTORTION ***
        11216   11217
```

```
*** WARNING ***                         CP=    178.150   TIME= 17:55:10
Volume 895 area 2798 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    178.160   TIME= 17:55:10
Volume 895 area 3351 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    178.190   TIME= 17:55:10
Meshing of volume 895 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   895 WITH EXCESSIVE DISTORTION ***
        11220   11221


*** WARNING ***                         CP=    182.890   TIME= 17:55:17
Volume 975 area 3595 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    182.930   TIME= 17:55:17
Meshing of volume 975 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   975 WITH EXCESSIVE DISTORTION ***
        11561   11562   11565   11566   11567   11568   11570


*** WARNING ***                         CP=    183.390   TIME= 17:55:18
Volume 981 area 3601 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    183.440   TIME= 17:55:18
Meshing of volume 981 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   981 WITH EXCESSIVE DISTORTION ***
        11654   11656   11658   11661   11662   11663   11664


*** WARNING ***                         CP=    183.500   TIME= 17:55:18
Meshing of volume 982 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   982 WITH EXCESSIVE DISTORTION ***
        11666


*** WARNING ***                         CP=    183.860   TIME= 17:55:19
Meshing of volume 986 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   986 WITH EXCESSIVE DISTORTION ***
        11726


*** WARNING ***                         CP=    183.880   TIME= 17:55:19
Volume 987 area 3607 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    183.920   TIME= 17:55:19
Meshing of volume 987 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   987 WITH EXCESSIVE DISTORTION ***
        11737   11738   11739   11740   11742   11744   11746


*** WARNING ***                         CP=    184.050   TIME= 17:55:19
Volume 989 area 3609 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=    184.090   TIME= 17:55:19
Meshing of volume 989 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   989 WITH EXCESSIVE DISTORTION ***
```

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        11765   11766   11769   11770   11771   11772   11774

NUMBER OF VOLUMES MESHED   =    446
MAXIMUM NODE NUMBER        =  17143
MAXIMUM ELEMENT NUMBER     =  11828
 mesh upper outer barrier adding backfill mass

INVERT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO     1010 STEP        1

  564  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL  COMMAND.

UNSELECT     FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        5 STEP        1

   160  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ELEMENT TYPE SET TO     7

MATERIAL NUMBER SET TO     7

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

NUMBER OF VOLUMES MESHED   =    160
MAXIMUM NODE NUMBER        =  19211
MAXIMUM ELEMENT NUMBER     =  13764

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   951  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=    206.740   TIME= 17:56:04
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   951
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.90500     AND   1.2300
  KABS=  0.  TOLERANCE= 0.000000E+00

  1588  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Z     BETWEEN  3.3450     AND   3.6700
  KABS=  0.  TOLERANCE= 0.000000E+00

  3176  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.82995     AND  0.83195
  KABS=  0.  TOLERANCE= 0.000000E+00

   196  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    20  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
```

```
SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   19211 BY       1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO     1010 STEP        1

  1010  VOLUMES (OF   1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO     3694 STEP        1

 3694  AREAS (OF  3694  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO     4380 STEP        1

 4380  LINES (OF  4380  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO     9001 STEP        1

  1710  KEYPOINTS (OF   1710  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO    13764 STEP        1

 13764  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT   FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO    19211 STEP        1

 19211  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
 FOR POSSIBLE RESUME FROM THIS POINT


***** ROUTINE COMPLETED *****  CP =       233.920


*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A MODAL ANALYSIS
 THIS WILL BE A NEW ANALYSIS


USE SUBSPACE ITERATION METHOD
 EXTRACT    8 MODES
 NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****

*** WARNING ***                         CP=    267.620   TIME= 18:01:04
Element 4156 has an angle between adjacent edges of 38.4597531 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=    267.620   TIME= 18:01:04
Element 4156 has an angle between adjacent edges of 141.535362 on face
```

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.620 TIME= 18:01:04
Element 4157 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.620 TIME= 18:01:04
Element 4157 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.630 TIME= 18:01:04
Element 4158 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.630 TIME= 18:01:04
Element 4158 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.640 TIME= 18:01:04
Element 4159 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.640 TIME= 18:01:04
Element 4159 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.640 TIME= 18:01:04
Element 4160 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.640 TIME= 18:01:04
Element 4160 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4161 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4161 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4162 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4162 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4163 has an angle between adjacent edges of 38.4597531 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.650 TIME= 18:01:04
Element 4163 has an angle between adjacent edges of 141.535362 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.660 TIME= 18:01:05
Element 4164 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.670 TIME= 18:01:05
Element 4164 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.670 TIME= 18:01:05
Element 4165 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.670 TIME= 18:01:05
Element 4165 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.670 TIME= 18:01:05
Element 4166 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.680 TIME= 18:01:05
Element 4166 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.680 TIME= 18:01:05
Element 4167 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.680 TIME= 18:01:05
Element 4167 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4168 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4168 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4169 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4169 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4170 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4170 has an angle between adjacent edges of 141.535362 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4171 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4171 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4172 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4172 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.690 TIME= 18:01:05
Element 4173 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.700 TIME= 18:01:05
Element 4173 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.700 TIME= 18:01:05
Element 4174 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.700 TIME= 18:01:05
Element 4174 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.700 TIME= 18:01:05
Element 4175 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.700 TIME= 18:01:05
Element 4175 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.710 TIME= 18:01:05
Element 4176 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.710 TIME= 18:01:05
Element 4176 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.710 TIME= 18:01:05
Element 4177 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.710 TIME= 18:01:05
Element 4177 has an angle between adjacent edges of 149.933722 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4178 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4178 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4179 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4179 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4180 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4180 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.720 TIME= 18:01:05
Element 4181 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.730 TIME= 18:01:05
Element 4181 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.730 TIME= 18:01:05
Element 4182 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.730 TIME= 18:01:05
Element 4182 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.730 TIME= 18:01:05
Element 4183 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.730 TIME= 18:01:05
Element 4183 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.740 TIME= 18:01:05
Element 4184 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.740 TIME= 18:01:05
Element 4184 has an angle between adjacent edges of 149.933722 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.750 TIME= 18:01:05
Element 4185 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.750 TIME= 18:01:05
Element 4185 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.750 TIME= 18:01:05
Element 4186 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.750 TIME= 18:01:05
Element 4186 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.750 TIME= 18:01:05
Element 4187 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.760 TIME= 18:01:05
Element 4187 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.760 TIME= 18:01:05
Element 4190 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.760 TIME= 18:01:05
Element 4190 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.760 TIME= 18:01:05
Element 4191 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.760 TIME= 18:01:05
Element 4191 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.770 TIME= 18:01:05
Element 4194 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.770 TIME= 18:01:05
Element 4194 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.770 TIME= 18:01:05
Element 4195 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.770 TIME= 18:01:05
Element 4195 has an angle between adjacent edges of 141.535362 on face

```
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.780   TIME= 18:01:05
Element 4198 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.780   TIME= 18:01:05
Element 4198 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.780   TIME= 18:01:05
Element 4199 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.780   TIME= 18:01:05
Element 4199 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.780   TIME= 18:01:05
Element 4202 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.790   TIME= 18:01:05
Element 4202 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.790   TIME= 18:01:05
Element 4203 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.790   TIME= 18:01:05
Element 4203 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.790   TIME= 18:01:05
Element 4206 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.800   TIME= 18:01:05
Element 4206 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.800   TIME= 18:01:05
Element 4207 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.800   TIME= 18:01:05
Element 4207 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.800   TIME= 18:01:05
Element 4210 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    267.800   TIME= 18:01:05
Element 4210 has an angle between adjacent edges of 149.933722 on face
```

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.800 TIME= 18:01:05
Element 4211 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.800 TIME= 18:01:05
Element 4211 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.800 TIME= 18:01:05
Element 4214 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.810 TIME= 18:01:05
Element 4214 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.810 TIME= 18:01:05
Element 4215 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.810 TIME= 18:01:05
Element 4215 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.810 TIME= 18:01:05
Element 4218 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.810 TIME= 18:01:05
Element 4218 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4219 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4219 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4222 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4222 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4223 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.820 TIME= 18:01:05
Element 4223 has an angle between adjacent edges of 141.535362 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.830 TIME= 18:01:05
Element 4226 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.830 TIME= 18:01:05
Element 4226 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.830 TIME= 18:01:05
Element 4227 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.830 TIME= 18:01:05
Element 4227 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.840 TIME= 18:01:05
Element 4230 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.840 TIME= 18:01:05
Element 4230 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.840 TIME= 18:01:05
Element 4231 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.840 TIME= 18:01:05
Element 4231 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.840 TIME= 18:01:05
Element 4234 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.850 TIME= 18:01:05
Element 4234 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.850 TIME= 18:01:05
Element 4235 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.850 TIME= 18:01:05
Element 4235 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.850 TIME= 18:01:05
Element 4238 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 267.850 TIME= 18:01:05
Element 4238 has an angle between adjacent edges of 149.933722 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.860 TIME= 18:01:05
Element 4239 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.860 TIME= 18:01:05
Element 4239 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.860 TIME= 18:01:05
Element 4242 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.860 TIME= 18:01:05
Element 4242 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.870 TIME= 18:01:05
Element 4243 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 267.870 TIME= 18:01:05
Element 4243 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.030 TIME= 18:01:05
Element 4458 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.030 TIME= 18:01:05
Element 4458 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.030 TIME= 18:01:05
Element 4459 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.040 TIME= 18:01:05
Element 4459 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.040 TIME= 18:01:05
Element 4462 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.040 TIME= 18:01:05
Element 4462 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.040 TIME= 18:01:05
Element 4463 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.040 TIME= 18:01:05
Element 4463 has an angle between adjacent edges of 38.4646378 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.050 TIME= 18:01:05
Element 4466 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.050 TIME= 18:01:05
Element 4466 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.050 TIME= 18:01:05
Element 4467 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.050 TIME= 18:01:05
Element 4467 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4470 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4470 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4471 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4471 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4474 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4474 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4475 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4475 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4478 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4478 has an angle between adjacent edges of 141.535362 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4479 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.060 TIME= 18:01:05
Element 4479 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.070 TIME= 18:01:05
Element 4482 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.080 TIME= 18:01:05
Element 4482 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.080 TIME= 18:01:05
Element 4483 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.080 TIME= 18:01:05
Element 4483 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4486 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4486 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4487 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4487 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4490 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4490 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4491 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4491 has an angle between adjacent edges of 38.4646378 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4494 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4494 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4495 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4495 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.100 TIME= 18:01:05
Element 4498 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4498 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4499 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4499 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4502 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4502 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.110 TIME= 18:01:05
Element 4503 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.120 TIME= 18:01:05
Element 4503 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.130 TIME= 18:01:05
Element 4506 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 268.130 TIME= 18:01:05
Element 4506 has an angle between adjacent edges of 141.535362 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4507 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4507 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4510 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4510 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4511 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.140 TIME= 18:01:05
Element 4511 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.150 TIME= 18:01:05
Element 4514 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.150 TIME= 18:01:05
Element 4514 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.150 TIME= 18:01:05
Element 4515 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.150 TIME= 18:01:05
Element 4515 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.170 TIME= 18:01:06
Element 4546 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.170 TIME= 18:01:06
Element 4546 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.170 TIME= 18:01:06
Element 4547 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 268.180 TIME= 18:01:06
Element 4547 has an angle between adjacent edges of 141.535362 on face

```
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.180   TIME= 18:01:06
Element 4548 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.180   TIME= 18:01:06
Element 4548 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.190   TIME= 18:01:06
Element 4549 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.190   TIME= 18:01:06
Element 4549 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.190   TIME= 18:01:06
Element 4550 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.190   TIME= 18:01:06
Element 4550 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.200   TIME= 18:01:06
Element 4551 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.200   TIME= 18:01:06
Element 4551 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.200   TIME= 18:01:06
Element 4552 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.200   TIME= 18:01:06
Element 4552 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.210   TIME= 18:01:06
Element 4553 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.210   TIME= 18:01:06
Element 4553 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.220   TIME= 18:01:06
Element 4554 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    268.220   TIME= 18:01:06
Element 4554 has an angle between adjacent edges of 141.535362 on face
```

```
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=    268.220   TIME= 18:01:06
Element 4555 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=    268.230   TIME= 18:01:06
Element 4555 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*****************************************************************************
Error messages discontinued after 200 messages were displayed.
 More may exist.  See ( seism5.err ) for suppressed messages.
*****************************************************************************

*** NOTE ***                            CP=    275.070   TIME= 18:01:20
The model data was checked and warning messages were found.
 Please review output or errors file ( seism5.err ) for these warning
 messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   18:01:20  APR 19, 1996 CP=    275.080
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
  NUMBER OF MODES TO EXTRACT. . . . . .     8

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1



          ***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

  CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

  TOTAL MASS =  32981.

                          MOM. OF INERTIA          MOM. OF INERTIA
     CENTROID              ABOUT ORIGIN             ABOUT CENTROID

  XC =  0.40090        IXX =   0.2550E+06      IXX =   0.8015E+05
  YC =  0.11812        IYY =   0.2545E+06      IYY =   0.7480E+05
  ZC =   2.2993        IZZ =   0.1474E+05      IZZ =    8983.
                       IXY =    -1505.         IXY =    56.41
                       IYZ =    -8989.         IYZ =   -32.08
                       IZX =  -0.3043E+05      IZX =   -26.66


  *** MASS SUMMARY BY ELEMENT TYPE ***

  TYPE      MASS
     1    10016.1
     2    982.613
     3    649.245
     4    354.547
```

```
    5   2104.91
    6   7186.21
    7   11687.1

Range of element maximum matrix coefficients in global coordinates
Maximum= 1.047821976E+11 at element 2547.
Minimum= 480530912 at element 6464.

  *** ELEMENT MATRIX FORMULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    1    2820  SOLID45      18.120    0.006
    2    1170  SOLID45       7.580    0.006
    3     720  SOLID45       4.670    0.006
    4     270  SOLID45       1.880    0.007
    5    3048  SOLID45      19.270    0.006
    6    3800  SOLID45      24.700    0.006
    7    1936  SOLID45      11.790    0.006
Time at end of element matrix formulation CP= 380.92.

Estimated number of active DOF= 56662.
Maximum wavefront= 2121.

Time at end of matrix triangularization CP= 612.03.

SUBSPACE SIZE OF   12 VECTORS USED FOR CALCULATION OF FIRST    8 EIGENVECTORS.
 MAXIMUM ITERATIONS   =     100
 NUMBER OF EQUATIONS  =   56662
 MAXIMUM WAVEFRONT    =    2121
 ITERATIONS PER SHIFT =       5
 MAXIMUM MODES STORED =      12
 MAXIMUM EIGENVALUE   = 0.10000E+07
 WORK SPACE (MBYTE)   =  17.997

Equation solver maximum pivot= 5.381411263E+11 at node 3291 UX.

Equation solver minimum pivot= 1301409.26 at node 18432 UZ.


    *****  ITERATION    1  COMPLETE *****  CP=    10640.560  WALL=     21.9278

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   1    0.51954974E-02    0.00000000E+00     0.10656E-02
   2     158.25102        0.00000000E+00     0.10000E+01
   3     218.29320        0.00000000E+00     0.10000E+01
   4     303.46580        0.00000000E+00     0.10000E+01
   5     476.67849        0.00000000E+00     0.10000E+01
   6     640.60700        0.00000000E+00     0.10000E+01
   7     686.40120        0.00000000E+00     0.10000E+01
   8     721.46079        0.00000000E+00     0.10000E+01
   9     740.03657        0.00000000E+00     0.10000E+01
  10     785.21039        0.00000000E+00     0.10000E+01
  11     840.31051        0.00000000E+00     0.10000E+01
  12     888.07219        0.00000000E+00     0.10000E+01

ITERATIONS SINCE LAST SHIFT=     1
TOTAL NUMBER OF ITERATIONS=      1
NUMBER OF MODES CONVERGED=       0
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=          -1.0000
CP TIME FOR TRIANGULARIZATION= 9570.000
CP TIME SINCE LAST SHIFT=       451.220


    *****  ITERATION    2  COMPLETE *****  CP=    11091.590  WALL=     22.1922

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
```

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	0.26602956E-03	0.51954974E-02	0.10629E-02
2	117.56938	158.25102	0.81178E+00
3	121.45196	218.29320	0.22305E+01
4	155.09350	303.46580	0.28285E+01
5	194.00059	476.67849	0.50373E+01
6	283.61500	640.60700	0.41018E+01
7	371.25614	686.40120	0.24183E+01
8	395.33077	721.46079	0.23305E+01
9	457.01669	740.03657	0.16221E+01
10	493.67204	785.21039	0.15299E+01
11	496.18739	840.31051	0.18681E+01
12	544.10704	888.07219	0.16640E+01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 9570.000
CP TIME SINCE LAST SHIFT= 902.250

***** ITERATION 3 COMPLETE ***** CP= 11542.200 WALL= 22.4561

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	0.26266456E-03	0.26602956E-03	0.70234E-07
2	116.57277	117.56938	0.17172E-01
3	121.40220	121.45196	0.81986E-03
4	154.82691	155.09350	0.34467E-02
5	192.99931	194.00059	0.10403E-01
6	245.24875	283.61500	0.33735E+00
7	336.40472	371.25614	0.21793E+00
8	362.78342	395.33077	0.18748E+00
9	410.19310	457.01669	0.24133E+00
10	442.83706	493.67204	0.24277E+00
11	449.71761	496.18739	0.21734E+00
12	475.27201	544.10704	0.31064E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 1
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 9570.000
CP TIME SINCE LAST SHIFT= 1352.860

*** NOTE *** CP= 11542.200 TIME= 22:27:22
NEW SHIFT= 113.621084.

*** NOTE *** CP= 20688.230 TIME= 01:05:49
STURM number= 1 should be 1.

***** ITERATION 4 COMPLETE ***** CP= 21115.120 WALL= 25.3556

****** PREVIOUS CONVERGED EIGENVALUES *****
1 0.262664560E-03

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
2	116.57024	116.57277	0.43430E-04
3	121.40206	121.40220	0.23755E-05
4	154.82476	154.82691	0.27795E-04
5	192.97318	192.99931	0.27091E-03
6	243.00294	245.24875	0.18569E-01
7	328.84508	336.40472	0.46505E-01

8	356.32269	362.78342	0.36592E-01
9	397.02118	410.19310	0.67454E-01
10	417.04386	442.83706	0.12752E+00
11	428.18761	449.71761	0.10309E+00
12	455.01237	475.27201	0.91033E-01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 4
NUMBER OF MODES CONVERGED= 1
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 113.62
CP TIME FOR TRIANGULARIZATION= 9146.600
CP TIME SINCE LAST SHIFT= 426.320

***** ITERATION 5 COMPLETE ***** CP= 21541.250 WALL= 25.6119

****** PREVIOUS CONVERGED EIGENVALUES *****
1 0.262664560E-03

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
2	116.57024	116.57024	0.44123E-09
3	121.40206	121.40206	0.16855E-09
4	154.82475	154.82476	0.72935E-07
5	192.97274	192.97318	0.45035E-05
6	242.89864	243.00294	0.85894E-03
7	327.14970	328.84508	0.10391E-01
8	355.04166	356.32269	0.72292E-02
9	393.03788	397.02118	0.20372E-01
10	406.15708	417.04386	0.54327E-01
11	418.36294	428.18761	0.47519E-01
12	447.39996	455.01237	0.34319E-01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 5
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 113.62
CP TIME FOR TRIANGULARIZATION= 9146.600
CP TIME SINCE LAST SHIFT= 852.450

***** ITERATION 6 COMPLETE ***** CP= 21856.770 WALL= 25.8411

****** PREVIOUS CONVERGED EIGENVALUES *****
1 0.262664560E-03 2 116.570241 3 121.402056
4 154.824751 5 192.972742

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
6	242.89278	242.89864	0.48290E-04
7	326.74712	327.14970	0.24657E-02
8	354.74285	355.04166	0.16854E-02
9	391.55629	393.03788	0.75820E-02
10	401.23377	406.15708	0.24691E-01
11	413.31339	418.36294	0.24584E-01
12	443.60932	447.39996	0.17163E-01

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 6
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 113.62
CP TIME FOR TRIANGULARIZATION= 9146.600
CP TIME SINCE LAST SHIFT= 1167.970

```
     *****  ITERATION    7  COMPLETE *****  CP=    22171.800  WALL=      26.0700

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1 0.262664560E-03        2  116.570241           3  121.402056
        4  154.824751            5  192.972742

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   6      242.89241         242.89278         0.30844E-05
   7      326.64159         326.74712         0.64622E-03
   8      354.65594         354.74285         0.49017E-03
   9      390.85252         391.55629         0.36044E-02
  10      398.63835         401.23377         0.13064E-01
  11      410.42005         413.31339         0.14149E-01
  12      441.37570         443.60932         0.10147E-01

ITERATIONS SINCE LAST SHIFT=      4
TOTAL NUMBER OF ITERATIONS=       7
NUMBER OF MODES CONVERGED=        6
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=             113.62
CP TIME FOR TRIANGULARIZATION=  9146.600
CP TIME SINCE LAST SHIFT=       1483.000


     *****  ITERATION    8  COMPLETE *****  CP=    22458.830  WALL=      26.2911

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1 0.262664560E-03        2  116.570241           3  121.402056
        4  154.824751            5  192.972742           6  242.892405

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   7      326.61123         326.64159         0.18595E-03
   8      354.62505         354.65594         0.17423E-03
   9      390.44720         390.85252         0.20772E-02
  10      397.15440         398.63835         0.74868E-02
  11      408.51448         410.42005         0.93510E-02
  12      439.83320         441.37570         0.70263E-02

ITERATIONS SINCE LAST SHIFT=      5
TOTAL NUMBER OF ITERATIONS=       8
NUMBER OF MODES CONVERGED=        6
NUMBER OF WORKING VECTORS=       12
CURRENT SHIFT POINT=             113.62
CP TIME FOR TRIANGULARIZATION=  9146.600
CP TIME SINCE LAST SHIFT=       1770.030

*** NOTE ***                            CP=  22458.830   TIME= 02:17:28
NEW SHIFT= 322.941147.

*** NOTE ***                            CP=  31606.890   TIME= 04:55:58
STURM number= 6 should be 6.


     *****  ITERATION    9  COMPLETE *****  CP=    31894.450  WALL=      29.1558

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1 0.262664560E-03        2  116.570241           3  121.402056
        4  154.824751            5  192.972742           6  242.892405

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   7      326.59744         326.61123         0.84415E-04
   8      354.60467         354.62505         0.11493E-03
   9      389.93433         390.44720         0.26323E-02
  10      395.56270         397.15440         0.80640E-02
```

```
   11      405.58834          408.51448          0.14481E-01
   12      437.31455          439.83320          0.11552E-01

 ITERATIONS SINCE LAST SHIFT=      1
 TOTAL NUMBER OF ITERATIONS=       9
 NUMBER OF MODES CONVERGED=        6
 NUMBER OF WORKING VECTORS=       12
 CURRENT SHIFT POINT=            322.94
 CP TIME FOR TRIANGULARIZATION=  9148.610
 CP TIME SINCE LAST SHIFT=        287.010


     *****  ITERATION   10  COMPLETE *****  CP=    32180.870  WALL=      29.3775

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1 0.262664560E-03        2  116.570241            3  121.402056
        4  154.824751            5  192.972742            6  242.892405

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
  MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
    7      326.59743          326.59744          0.91507E-07
    8      354.60315          354.60467          0.85920E-05

 *** NOTE ***                                CP=  32180.870   TIME= 05:22:39
 NEW SHIFT= 358.266804.

 *** NOTE ***                                CP=  41331.270   TIME= 08:01:09
 STURM number= 8 should be 8.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   08:01:13  APR 20, 1996 CP=  41331.860
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Static Analysis With Backfill


  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)


    1      0.26266456E-03
    2       116.57024
    3       121.40206
    4       154.82475
    5       192.97274
    6       242.89241
    7       326.59743
    8       354.60315


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  56662
  R.M.S. WAVEFRONT SIZE =  1441.5


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096
       71.250 MB WRITTEN ON ELEMENT MATRIX FILE: seism5.emat
       47.250 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism5.esav
       35.000 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism5.full
        4.047 MB WRITTEN ON MODAL MATRIX FILE: seism5.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =      41342.900
```

```
***** ANSYS SOLUTION ROUTINE *****

PERFORM AN EXPANSION PASS


NUMBER OF MODES TO EXPAND=     8
 CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

***** ANSYS SOLVE    COMMAND *****
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   08:02:01  APR 20, 1996 CP=  41342.910
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
     EXPANSION PASS . . . . . .ON
  NUMBER OF MODES TO EXPAND . . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY   COMPONENT
      ALL        ALL


  *** ELEMENT RESULT CALCULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    1    2820  SOLID45      10.170    0.004
    2    1170  SOLID45       4.220    0.004
    3     720  SOLID45       2.430    0.003
    4     270  SOLID45       0.980    0.004
    5    3048  SOLID45      11.080    0.004
    6    3800  SOLID45      13.330    0.004
    7    1936  SOLID45       7.140    0.004

  *** NODAL LOAD CALCULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    1    2820  SOLID45       1.120    0.000
    2    1170  SOLID45       0.510    0.000
    3     720  SOLID45       0.340    0.000
    4     270  SOLID45       0.110    0.000
    5    3048  SOLID45       1.090    0.000
    6    3800  SOLID45       1.630    0.000
    7    1936  SOLID45       0.610    0.000


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
     168.797 MB WRITTEN ON RESULTS FILE: seism5.rst

FINISH SOLUTION PROCESSING
```

```
***** ROUTINE COMPLETED *****  CP =      41821.530


*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A SPECTRUM ANALYSIS
 THIS WILL BE A NEW ANALYSIS

*** NOTE ***                                CP=  41821.530   TIME= 08:26:56
Some analysis options have been reset to their defaults.  Please verify
 current settings or respecify as required.


USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
 USE ALL MODES FROM THE MODAL ANALYSIS
 INCLUDE STRESS RESPONSES IN THE CALCULATIONS

SEISMIC EXCITATION DIRECTION = 0.00000E+00  1.0000     0.00000E+00

SPECTRUM TYPE KEY=  2  FACTOR=  1.00000

FREQ= 0.100      100.     0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
NUMBER OF FREQUENCIES IN TABLE =  2

DAMPING= 0.00000E+00  SV=     16.285         16.285        0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00


COMBINE MODES USING THE SRSS METHOD
 WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   08:29:12  APR 20, 1996 CP=  41852.020
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .SPECTRUM
     SPECTRUM TYPE. . . . . .SINGLE POINT
  NUMBER OF MODES TO BE USED. . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1
  SPECTRUM LOADING TYPE . . . . . .ACCELERATION
  EXCITATION DIRECTION. . . . . 0.00000E+00  1.0000     0.00000E+00
  MODE COMBINATION TYPE . . . . . .SRSS
     SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY    COMPONENT
      ALL         ALL
```

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 08:29:40 APR 20, 1996 CP= 41858.850
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07

SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

MODE	FREQUENCY	DAMPING	SV	MODE COEF.
1	0.2627E-03	0.0000	16.285	0.2461
2	116.6	0.0000	16.285	-0.9736E-05
3	121.4	0.0000	16.285	0.1635E-03
4	154.8	0.0000	16.285	0.2709E-02
5	193.0	0.0000	16.285	0.9061E-03
6	242.9	0.0000	16.285	0.5612E-05
7	326.6	0.0000	16.285	0.2714E-04
8	354.6	0.0000	16.285	-0.2449E-06

MODAL COMBINATION COEFFICIENTS

MODE=	1	FREQUENCY=	0.000	COUPLING COEF.=	1.000
MODE=	2	FREQUENCY=	116.570	COUPLING COEF.=	1.000
MODE=	3	FREQUENCY=	121.402	COUPLING COEF.=	1.000
MODE=	4	FREQUENCY=	154.825	COUPLING COEF.=	1.000
MODE=	5	FREQUENCY=	192.973	COUPLING COEF.=	1.000
MODE=	6	FREQUENCY=	242.892	COUPLING COEF.=	1.000
MODE=	7	FREQUENCY=	326.597	COUPLING COEF.=	1.000
MODE=	8	FREQUENCY=	354.603	COUPLING COEF.=	1.000

SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE seism5.mcom

*** PROBLEM STATISTICS
ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM = 56662
R.M.S. WAVEFRONT SIZE = 1441.5

*** ANSYS BINARY FILE STATISTICS
BUFFER SIZE USED= 4096

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 41858.860

PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 1678
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

*** PAGE FILE USED ***
NUMBER OF R/W OPERATIONS= 22776
MAXIMUM RECORD NUMBER = 1184
RECORD SIZE (I*4 WORDS) = 16384
PAGE FILE SIZE (MB) = 74.000

```
*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =      41885.570      TIME  =  08:32:02       |
|       ELAPSED TIME (sec) =      52928.000      DATE  =  04/20/96       |
|                                                                        |
*------------------------------------------------------------------------*
```

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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postf5
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.190   TIME= 15:56:31
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postf5    15:56:31  APR 20, 1996 CP=      0.190

    1  resume,seism5,db
    2  /filnam,seism5
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /out,seism4,res
    7  /com, 0% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
    8  /com, 0% Degradation of Inner Barrier
    9  /com,
   10  /com,
   11  /com, MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER
   12  /com,
   13  /com, Outer Barrier
   14  esel,s,type,,6,7
   15  nsle
   16  esln
   17  nsort,s,int,0,0,1
   18  prns,s,prin
   19
   20  /com,
   21  /com,
   22  /com, MAXIMUM STRESS INTENSITY IN THE INNER BARRIER
   23  /com,
   24  /com,
   25  esel,s,type,,5
   26  nsle
   27  esln
   28  nsort,s,int,0,0,1
   29  prns,s,prin
   30
   31  /com,
   32  /com,
   33  /com, MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES
   34  /com,
   35  /com,
   36  esel,s,type,,1
   37  esel,a,type,,3,4
   38  nsle
   39  esln
   40  nsort,s,int,0,0,1
   41  prns,s,prin
   42
   43  /com,
   44  /com,
   45  /com, MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES
   46  /com,
   47  /com,
   48  esel,s,type,,2
   49  nsle
   50  esln
```

```
   51  nsort,s,int,0,0,1
   52  prns,s,prin
   53
   54  /out
   55  fini
   56  /exit,nosave
   57  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI        =     3.141593
   ****************************************************************
   ANSYS STARTUP FILE  start.ans
   ****************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,

ABBREVIATION= PR0       /psf,pres,norm,0,
```

```
 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ****************************************************************
    END  start.ans
    ****************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ****************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism5.db

 *** NOTE ***                            CP=       7.190   TIME= 15:56:47
 Page file used.

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Static Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      7
  13764 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =  13764
  19211 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  19211
   1710 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   4380 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   4380
   3694 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   3694
   1010 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =   1010
 MAXIMUM LINEAR PROPERTY NUMBER        =       7
 MAXIMUM REAL CONSTANT SET NUMBER      =       7
 ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS       =     971

 INITIAL JOBNAME = postf5
 CURRENT JOBNAME = postf5

 CURRENT JOBNAME REDEFINED AS seism5
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   15:57:09  APR 20, 1996 CP=     14.210
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Static Analysis With Backfill


         ***** ANSYS RESULTS INTERPRETATION (POST1) *****

 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
   TIME/FREQUENCY=  192.97
```

```
 TITLE=  21 PWR Tube Static Analysis With Backfill

 /INPUT FILE= seism5.mcom  LINE=       0
 ANSYS REVISION  5.1              24    08:29:40    04/20/1996
  seism5.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.24614

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                            CP=     59.230   TIME= 16:01:44
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.97360E-05

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.97360E-05 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.97360E-05 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.16350E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.16350E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.16350E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.27086E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.27086E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.27086E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTE>     5  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.90607E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.90607E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.90607E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTE>     6  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.56121E-05
```

```
LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.56121E-05 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.56121E-05 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism5.rst
 21 PWR Tube Static Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.27137E-04

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.27137E-04 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.27137E-04 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism5.rst
 21 PWR Tube Static Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.24494E-06

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.24494E-06 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.24494E-06 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE

/OUTPUT FILE= seism4.res

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       209.990


EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        27085
MAXIMUM RECORD NUMBER   =         1039
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       64.938

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =        210.020     TIME  =  16:19:03        |
|       ELAPSED TIME (sec) =       1353.000     DATE  =  04/20/96        |
|                                                                        |
*------------------------------------------------------------------------*
```

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```
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 PRESS <CR> OR <ENTER> TO CONTINUE


         ***** ANSYS COMMAND LINE ARGUMENTS *****
  INITIAL JOBNAME            = postlin5
  MEMORY REQUESTED (MB)      =     64.0
  BATCH MODE REQUESTED       = LIST
  START-UP FILE MODE         = READ

 *** NOTE ***                            CP=      0.190   TIME= 16:33:59
 There are no parameters and no abbreviations defined.

 38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
 FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
 CURRENT JOBNAME=postlin5  16:33:59  APR 20, 1996 CP=      0.200

     1  resume,seism5,db
     2  /filnam,seism5
     3  /post1
     4  set,1,5
     5  /input,,mcom
     6  /com, Outer Barrier Stress Distribution
     7  nsel,s,node,,13477
     8  nsel,a,node,,13532
     9  nsel,a,node,,12613
    10  nsel,a,node,,12668
    11  nsel,a,node,,8071
    12  esln
    13  lpath,13477,8071
    14  /out,obstress
    15  /com, Outer Barrier Linearized Stresses at Location of Peak Stress
    16  prsect
    17  /out
    18  /show,obdist,grph
    19  plsect,s,int
    20  /show,term
    21  /com, Inner Barrier Stress Distribution
    22  nsel,s,node,,7253
    23  nsel,a,node,,8021
    24  nsel,a,node,,8005
    25  esln
    26  lpath,7253,8005
    27  /out,ibstress
    28  /com, Inner Barrier Linearized Stresses at Location of Peak Stress
    29  prsect
    30  /out
    31  /show,ibdist,grph
    32  plsect,s,int
    33  /show,term
    34  /com, Basket Stress Distribution
    35  nsel,s,node,,7289
    36  nsel,a,node,,2457
    37  esln
    38  lpath,7289,2457
    39  /out,bktstress
    40  /com, Basket Tubes and Guides Linearized Stresses at Location of Peak Stress
    41  prsect
    42  /out
    43  /show,bktdist,grph
    44  plsect,s,int
    45  /show,term
    46  /com, Criticality Control Plate Stress Distribution
    47  nsel,s,node,,2969
    48  nsel,a,node,,5093
    49  esln
    50  lpath,2969,5093
```

```
   51  /out,pltstress
   52  /com, Criticality Control Plates Linearized Stresses at Location of Peak Stress
   53  prsect
   54  /out
   55  /show,pltdist,grph
   56  plsect,s,int
   57  /show,term
   58  fini
   59  /exit,nosave

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***********************************************************************
   ANSYS STARTUP FILE  start.ans
   ***********************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,
```

```
ABBREVIATION= PRO       /psf,pres,norm,0,

ABBREVIATION= U1        /pbc,u,1,

ABBREVIATION= U0        /pbc,u,0,

ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ****************************************************************
   END  start.ans
   ****************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ****************************************************************

RESUME ANSYS DATA FROM FILE NAME=seism5.db

*** NOTE ***                            CP=      6.870   TIME= 16:34:12
Page file used.

*** ANSYS GLOBAL STATUS ***

TITLE =  21 PWR Tube Static Analysis With Backfill
ANALYSIS TYPE =  SPECTRUM
NUMBER OF ELEMENT TYPES =      7
 13764 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =  13764
 19211 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  19211
  1710 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
  4380 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   4380
  3694 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   3694
  1010 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =   1010
MAXIMUM LINEAR PROPERTY NUMBER       =       7
MAXIMUM REAL CONSTANT SET NUMBER     =       7
ACTIVE COORDINATE SYSTEM             =       0  (CARTESIAN)
NUMBER OF SPECIFIED CONSTRAINTS      =     971

INITIAL JOBNAME = postlin5
CURRENT JOBNAME = postlin5

CURRENT JOBNAME REDEFINED AS seism5
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   16:34:32  APR 20, 1996 CP=     13.680
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill

        ***** ANSYS RESULTS INTERPRETATION (POST1) *****

USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0
```

```
 SET COMMAND GOT LOAD STEP=      1  SUBSTEP=      5  CUMULATIVE ITERATION=      5
   TIME/FREQUENCY=  192.97
 TITLE=  21 PWR Tube Static Analysis With Backfill

 /INPUT FILE= seism5.mcom  LINE=       0
 ANSYS REVISION  5.1              24     08:29:40     04/20/1996
  seism5.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      1  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE    1 FACTOR SET TO 0.24614

 COPY LOAD CASE    1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                                CP=      55.330   TIME= 16:38:44
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      2  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE    1 FACTOR SET TO-0.97360E-05

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR=-0.97360E-05 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR=-0.97360E-05 ABS=    0

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      3  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE    1 FACTOR SET TO 0.16350E-03

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR= 0.16350E-03 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR= 0.16350E-03 ABS=    0

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      4  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE    1 FACTOR SET TO 0.27086E-02

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR= 0.27086E-02 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR= 0.27086E-02 ABS=    0

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      5  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill


 LOAD CASE    1 FACTOR SET TO 0.90607E-03

 LCOPER OPERATION ADD  USING LOAD CASE=    1 FACTOR= 0.90607E-03 ABS=    0
 MULTIPLIED BY LOAD CASE=    1 FACTOR= 0.90607E-03 ABS=    0

 LOAD CASE    1 IS LOAD STEP      1  SUBSTEP      6  COMPLEX=  0
 FILE= seism5.rst
  21 PWR Tube Static Analysis With Backfill
```

```
LOAD CASE   1 FACTOR SET TO 0.56121E-05

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.56121E-05 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.56121E-05 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism5.rst
 21 PWR Tube Static Analysis With Backfi.l


LOAD CASE   1 FACTOR SET TO 0.27137E-04

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.27137E-04 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.27137E-04 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism5.rst
 21 PWR Tube Static Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.24494E-06

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.24494E-06 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.24494E-06 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE
 Outer Barrier Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE   13477 TO    13477 STEP        1

     1  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   13532 TO    13532 STEP        1

     2  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12613 TO    12613 STEP        1

     3  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE   12668 TO    12668 STEP        1

     4  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    8071 TO     8071 STEP        1

     5  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

    20 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
     5 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
     13477  8071

/OUTPUT FILE= obstress

/SHOW SWITCH PLOTS TO FILE obdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE obdist.grph       - RASTER MODE.
DISPLAY TITLE=
```

```
 21 PWR Tube Static Analysis With Backfill
 Inner Barrier Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    7253 TO     7253 STEP        1

     1  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    8021 TO     8021 STEP        1

     2  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    8005 TO     8005 STEP        1

     3  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

    14 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      7253  8005

/OUTPUT FILE= ibstress

/SHOW SWITCH PLOTS TO FILE ibdist.grph       - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE ibdist.grph       - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Static Analysis With Backfill
 Basket Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    7289 TO     7289 STEP        1

     1  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    2457 TO     2457 STEP        1

     2  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     8 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
     2 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
    7289  2457

/OUTPUT FILE= bktstres

/SHOW SWITCH PLOTS TO FILE bktdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE bktdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Static Analysis With Backfill
 Criticality Control Plate Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    2969 TO     2969 STEP        1
```

```
     1  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    5093 TO     5093 STEP        1

     2  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

    12 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
     2 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      2969  5093

/OUTPUT FILE= pltstres

/SHOW SWITCH PLOTS TO FILE pltdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE pltdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Static Analysis With Backfill

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       174.610


EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        23393
MAXIMUM RECORD NUMBER   =         1003
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       62.688

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =        174.650      TIME  =  16:52:05       |
|       ELAPSED TIME (sec) =       1087.000      DATE  =  04/20/96       |
|                                                                        |
*------------------------------------------------------------------------*
```

```
/COM,ANSYS REVISION  5.1              24    08:29:40    04/20/1996
/COM, seism5.mcom
LCOPER,ZERO
LCDEFI,1,     1,     1
LCFACT,1,  0.246141
LCASE,1
LCOPER,SQUARE
LCDEFI,1,     1,     2
LCFACT,1, -0.973604E-05
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     3
LCFACT,1,  0.163501E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     4
LCFACT,1,  0.270855E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     5
LCFACT,1,  0.906065E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     6
LCFACT,1,  0.561205E-05
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     7
LCFACT,1,  0.271374E-04
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     8
LCFACT,1, -0.244939E-06
LCOPER,ADD,1,MULT,1
LCOPER,SQRT
```

0% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
0% Degradation of Inner Barrier

MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER

Outer Barrier

```
SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       6 TO        7 STEP        1

  5736  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  8708 NODES (OF  19211  DEFINED) SELECTED FROM
  5736 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  7308 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
  8708 SELECTED NODES BY  ESLN COMMAND.

SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

SORT COMPLETED FOR     1 VALUES.

PRINT S    NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   16:17:27  APR 20, 1996 CP=     192.780
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill


 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=     0

  NODE    S1          S2          S3          SINT        SEQV
 13477  0.46759E+07 0.18506E+07-0.53385E+06 0.52097E+07 0.45171E+07

MINIMUM VALUES
NODE     13477       13477       13477       13477       13477
VALUE   0.46759E+07 0.18506E+07-0.53385E+06 0.52097E+07 0.45171E+07

MAXIMUM VALUES
NODE     13477       13477       13477       13477       13477
VALUE   0.46759E+07 0.18506E+07-0.53385E+06 0.52097E+07 0.45171E+07


 MAXIMUM STRESS INTENSITY IN THE INNER BARRIER


SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        5 STEP        1

  3048  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  5425 NODES (OF  19211  DEFINED) SELECTED FROM
  3048 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  5376 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
```

```
   5425 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S      COMPONENT=INT    ORDER= 0  KABS= 0  NMAX=      1

 SORT COMPLETED FOR      1 VALUES.

 PRINT S     NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX    16:18:17  APR 20, 1996 CP=     199.890
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Static Analysis With Backfill


  ***** POST1 NODAL STRESS LISTING *****

  CALCULATED LOAD CASE=      0

   NODE     S1          S2          S3          SINT        SEQV
   7253  0.41873E+07 0.84116E+06 0.47358E+06 0.37137E+07 0.35443E+07

 MINIMUM VALUES
 NODE       7253        7253        7253        7253        7253
 VALUE   0.41873E+07 0.84116E+06 0.47358E+06 0.37137E+07 0.35443E+07

 MAXIMUM VALUES
 NODE       7253        7253        7253        7253        7253
 VALUE   0.41873E+07 0.84116E+06 0.47358E+06 0.37137E+07 0.35443E+07


  MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES


 SELECT       FOR ITEM=TYPE COMPONENT=
  IN RANGE        1 TO         1 STEP         1

   2820  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

 ALSO SELECT  FOR ITEM=TYPE COMPONENT=
  IN RANGE        3 TO         4 STEP         1

   3810  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT       ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

   7536 NODES (OF  19211  DEFINED) SELECTED FROM
   3810 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT       ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

   6000 ELEMENTS (OF  13764  DEFINED) SELECTED FROM
   7536 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S      COMPONENT=INT    ORDER= 0  KABS= 0  NMAX=      1

 SORT COMPLETED FOR      1 VALUES.

 PRINT S     NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX    16:18:46  APR 20, 1996 CP=     205.970
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Static Analysis With Backfill
```

***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
7289	0.62969E+07	0.71338E+06	0.32558E+06	0.59713E+07	0.57872E+07
MINIMUM VALUES					
NODE	7289	7289	7289	7289	7289
VALUE	0.62969E+07	0.71338E+06	0.32558E+06	0.59713E+07	0.57872E+07
MAXIMUM VALUES					
NODE	7289	7289	7289	7289	7289
VALUE	0.62969E+07	0.71338E+06	0.32558E+06	0.59713E+07	0.57872E+07

MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 2 TO 2 STEP 1

1170 ELEMENTS (OF 13764 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

2464 NODES (OF 19211 DEFINED) SELECTED FROM
1170 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

4032 ELEMENTS (OF 13764 DEFINED) SELECTED FROM
2464 SELECTED NODES BY ESLN COMMAND.

SORT ON ITEM=S COMPONENT=INT ORDER= 0 KABS= 0 NMAX= 1

SORT COMPLETED FOR 1 VALUES.

PRINT S NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 16:19:02 APR 20, 1996 CP= 209.960
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Static Analysis With Backfill

***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
2969	0.29990E+07	0.33573E+06	0.10190E+06	0.28971E+07	0.27875E+07
MINIMUM VALUES					
NODE	2969	2969	2969	2969	2969
VALUE	0.29990E+07	0.33573E+06	0.10190E+06	0.28971E+07	0.27875E+07
MAXIMUM VALUES					
NODE	2969	2969	2969	2969	2969
VALUE	0.29990E+07	0.33573E+06	0.10190E+06	0.28971E+07	0.27875E+07

100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
75% Degradation of Inner Barrier

MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER

No Outer Barrier

MAXIMUM STRESS INTENSITY IN THE INNER BARRIER

```
SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        6 STEP        1

  3936  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  6129 NODES (OF  12897  DEFINED) SELECTED FROM
  3936 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  4296 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  6129 SELECTED NODES BY  ESLN COMMAND.

SORT ON ITEM=S     COMPONENT=INT    ORDER= 0  KABS= 0  NMAX=      1

SORT COMPLETED FOR      1 VALUES.

PRINT S    NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   08:56:20  APR 10, 1996 CP=     104.270
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill

 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=      0

  NODE    S1          S2          S3          SINT        SEQV
 12757  0.12013E+09 0.34785E+08 0.90363E-07 0.11110E+09 0.10072E+09

MINIMUM VALUES
NODE      12757       12757       12757       12757       12757
VALUE   0.12013E+09 0.34785E+08 0.90363E-07 0.11110E+09 0.10072E+09

MAXIMUM VALUES
NODE      12757       12757       12757       12757       12757
VALUE   0.12013E+09 0.34785E+08 0.90363E-07 0.11110E+09 0.10072E+09

 MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES

SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        1 STEP        1

     0  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALSO SELECT  FOR ITEM=TYPE COMPONENT=
 IN RANGE       3 TO        4 STEP        1
```

```
  2160  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL   COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  3632 NODES (OF  12897  DEFINED) SELECTED FROM
  2160 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  3040 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  3632 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   08:56:23  APR 10, 1996 CP=    107.450
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=     0

  NODE    S1          S2          S3          SINT        SEQV
  4388  0.68906E+08 0.52819E+07-0.11621E+07 0.70068E+08 0.67078E+08

MINIMUM VALUES
NODE      4388        4388        4388        4388        4388
VALUE   0.68906E+08 0.52819E+07-0.11621E+07 0.70068E+08 0.67078E+08

MAXIMUM VALUES
NODE      4388        4388        4388        4388        4388
VALUE   0.68906E+08 0.52819E+07-0.11621E+07 0.70068E+08 0.67078E+08


 MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES


SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       2 TO        2 STEP        1

  2520  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL   COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  4000 NODES (OF  12897  DEFINED) SELECTED FROM
  2520 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  2910 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  4000 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   08:56:26  APR 10, 1996 CP=    110.240
```

FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
940	0.16742E+08	0.15945E+07	0.41819E+06	0.16323E+08	0.15768E+08

MINIMUM VALUES					
NODE	940	940	940	940	940
VALUE	0.16742E+08	0.15945E+07	0.41819E+06	0.16323E+08	0.15768E+08
MAXIMUM VALUES					
NODE	940	940	940	940	940
VALUE	0.16742E+08	0.15945E+07	0.41819E+06	0.16323E+08	0.15768E+08

100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
90% Degradation of Inner Barrier

MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER

No Outer Barrier

MAXIMUM STRESS INTENSITY IN THE INNER BARRIER

```
SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        6 STEP        1

  3936  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  6129 NODES (OF  12897  DEFINED) SELECTED FROM
  3936 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  4296 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  6129 SELECTED NODES BY  ESLN COMMAND.

SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

SORT COMPLETED FOR     1 VALUES.

PRINT S    NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   07:56:32  APR 11, 1996 CP=    103.820
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=     0

  NODE    S1          S2          S3          SINT        SEQV
 12757  0.79880E+09 0.25614E+09 0.14911E+09 0.64969E+09 0.60333E+09

MINIMUM VALUES
NODE     12757       12757       12757       12757       12757
VALUE   0.79880E+09 0.25614E+09 0.14911E+09 0.64969E+09 0.60333E+09

MAXIMUM VALUES
NODE     12757       12757       12757       12757       12757
VALUE   0.79880E+09 0.25614E+09 0.14911E+09 0.64969E+09 0.60333E+09


 MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES


SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        1 STEP        1

     0  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALSO SELECT  FOR ITEM=TYPE COMPONENT=
 IN RANGE       3 TO        4 STEP        1
```

```
  2160  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  3632 NODES (OF  12897  DEFINED) SELECTED FROM
  2160 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  3040 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  3632 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   07:56:35  APR 11, 1996 CP=    107.020
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** POST1 NODAL STRESS LISTING *****

  CALCULATED LOAD CASE=     0

   NODE    S1          S2          S3          SINT        SEQV
   6133  0.40416E+09 0.11688E+09 0.54628E+08 0.34953E+09 0.32293E+09

 MINIMUM VALUES
 NODE      6133        6133        6133        6133        6133
 VALUE   0.40416E+09 0.11688E+09 0.54628E+08 0.34953E+09 0.32293E+09

 MAXIMUM VALUES
 NODE      6133        6133        6133        6133        6133
 VALUE   0.40416E+09 0.11688E+09 0.54628E+08 0.34953E+09 0.32293E+09


  MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES


 SELECT       FOR ITEM=TYPE COMPONENT=
  IN RANGE       2 TO        2 STEP       1

   2520  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

   4000 NODES (OF  12897  DEFINED) SELECTED FROM
   2520 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

   2910 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
   4000 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   07:56:38  APR 11, 1996 CP=    109.850
```

FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
3938	0.22951E+08	0.25162E+07	0.16351E+06	0.22787E+08	0.21707E+08
MINIMUM VALUES					
NODE	3938	3938	3938	3938	3938
VALUE	0.22951E+08	0.25162E+07	0.16351E+06	0.22787E+08	0.21707E+08
MAXIMUM VALUES					
NODE	3938	3938	3938	3938	3938
VALUE	0.22951E+08	0.25162E+07	0.16351E+06	0.22787E+08	0.21707E+08

100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
90% Degradation of Inner Barrier

MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER

No Outer Barrier

MAXIMUM STRESS INTENSITY IN THE INNER BARRIER

```
SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        6 STEP        1

  3936  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  6129 NODES (OF  12897  DEFINED) SELECTED FROM
  3936 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  4296 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  6129 SELECTED NODES BY  ESLN COMMAND.

SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

SORT COMPLETED FOR     1 VALUES.

PRINT S    NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   19:30:05  APR 10, 1996 CP=    112.420
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=     0

  NODE    S1          S2          S3          SINT        SEQV
  8632  0.10789E+10 0.34399E+09 0.20275E+09 0.87612E+09 0.81474E+09

MINIMUM VALUES
NODE      8632        8632        8632        8632        8632
VALUE   0.10789E+10 0.34399E+09 0.20275E+09 0.87612E+09 0.81474E+09

MAXIMUM VALUES
NODE      8632        8632        8632        8632        8632
VALUE   0.10789E+10 0.34399E+09 0.20275E+09 0.87612E+09 0.81474E+09


 MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES


SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        1 STEP        1

     0  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALSO SELECT  FOR ITEM=TYPE COMPONENT=
 IN RANGE       3 TO        4 STEP        1
```

```
  2160  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  3632 NODES (OF  12897  DEFINED) SELECTED FROM
  2160 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  3040 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  3632 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   19:30:16  APR 10, 1996 CP=    115.860
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** POST1 NODAL STRESS LISTING *****

  CALCULATED LOAD CASE=     0

   NODE    S1          S2          S3          SINT        SEQV
   4355  0.50925E+09 0.14298E+09 0.64610E+08 0.44464E+09 0.41110E+09

 MINIMUM VALUES
 NODE      4355        4355        4355        4355        4355
 VALUE   0.50925E+09 0.14298E+09 0.64610E+08 0.44464E+09 0.41110E+09

 MAXIMUM VALUES
 NODE      4355        4355        4355        4355        4355
 VALUE   0.50925E+09 0.14298E+09 0.64610E+08 0.44464E+09 0.41110E+09


  MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES


 SELECT       FOR ITEM=TYPE COMPONENT=
  IN RANGE       2 TO        2 STEP        1

  2520  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  4000 NODES (OF  12897  DEFINED) SELECTED FROM
  2520 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  2910 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  4000 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   19:30:24  APR 10, 1996 CP=    118.840
```

FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

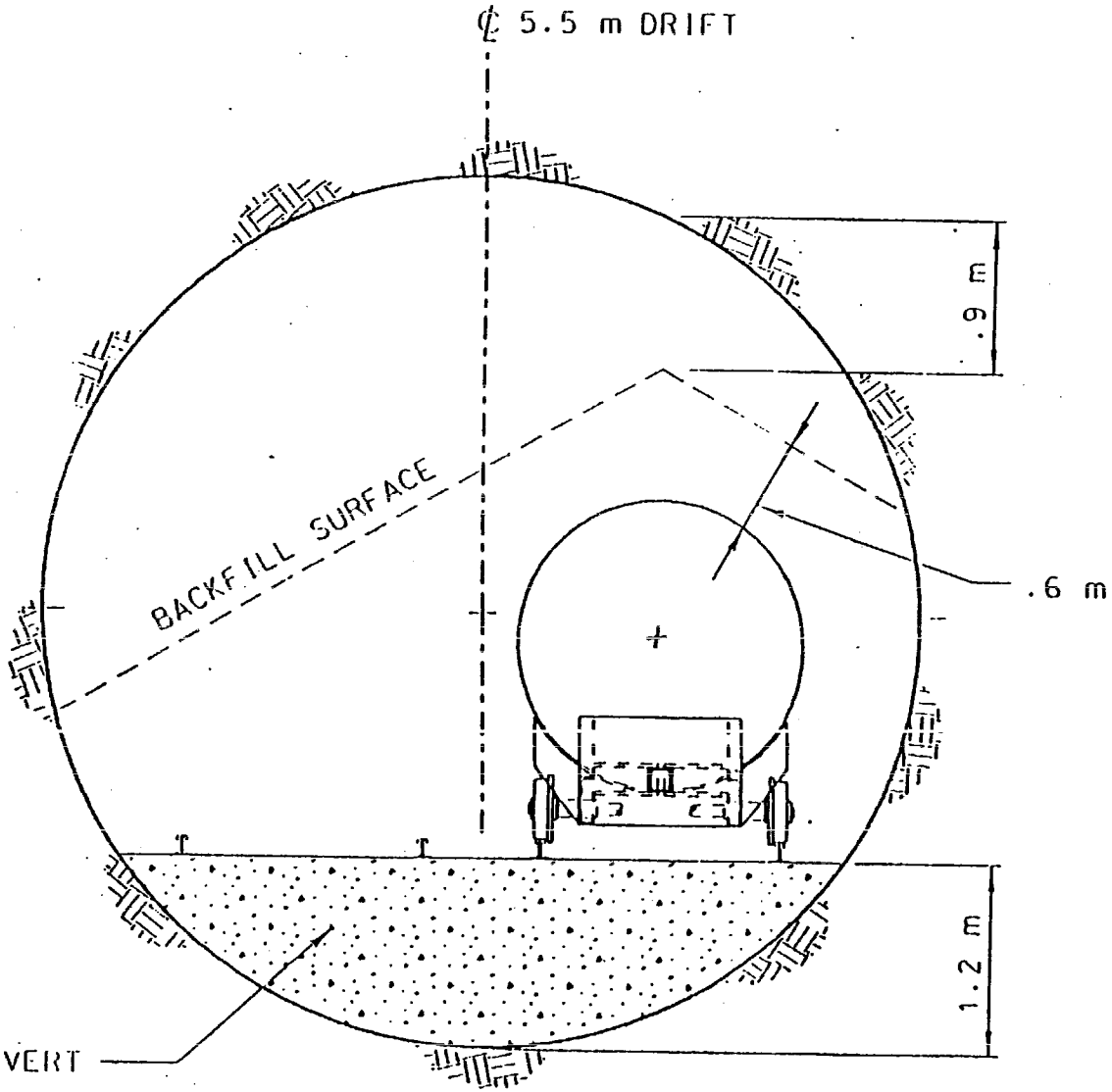
***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
3878	0.50410E+08	0.46854E+07	0.27423E+07	0.47668E+08	0.46727E+08
MINIMUM VALUES					
NODE	3878	3878	3878	3878	3878
VALUE	0.50410E+08	0.46854E+07	0.27423E+07	0.47668E+08	0.46727E+08
MAXIMUM VALUES					
NODE	3878	3878	3878	3878	3878
VALUE	0.50410E+08	0.46854E+07	0.27423E+07	0.47668E+08	0.46727E+08

PROFILE E.C. 06/19/96

BACKFILL PROFILE OF A TYPICAL WASTE EMPLACMENT DRIFT



Sandia National Laboratories

Laurence S. Costin
Acting Manager, YMP Management Department

P.O. Box 5800
Albuquerque, New Mexico 87185-1325

June 28, 1995

WBS: 1.2.2.4.3
1.2.3.13.2
QA: N/A

Robert M. Sandifer
MGDS Operations
M&O/TRW
101 Convention Center Drive
Suite P110
Las Vegas, NV 89109

Attn: Thomas Geer

Subject: Transmittal of Draft Copy of SAND94-2320, *Bench-Scale Experimental Determination of the Thermal Diffusivity of Crushed Tuff*

Gentlemen:

Attached you will find a draft copy of SAND94-2320, *Bench-Scale Experimental Determination of the Thermal Diffusivity of Crushed Tuff*. This report has completed the internal review process at Sandia National Laboratories and is currently being prepared for programmatic and policy review. Because of the report's relevance to the Fiscal Year (FY) 1995 Backfill Evaluation, an information copy of the report is being provided to assist in your study of backfill issues.

If you have any questions concerning this report, please contact Eric Ryder at (505) 848-0779.

Yours truly,

Laurence Costin

Attachment

LSC/EER/lasc

Copy to (with attachment)
M. Voegele M&O/SAIC
V. Dulock M&O/TRW
L. Rickertsen M&O/TRW
R. Andrews M&O/INTERA
C. T. Statton M&O/WCFS
T. Doering M&O/B&W
J.C. DeLaGarza DOE/YMSCO
MS-1325 Laurence S. Costin, 6302
MS-1399 Mikey Brady, 6314
MS-1325 Eric E. Ryder, 6313

crushed tuff in the container. This porosity is consistent with the 25 to 53% porosities obtained in large-scale laboratory tests of backfill emplacement techniques reported by Stout and Friel [1982].

Once the test set-up was complete, full power was applied to the heater for approximately 23.5 hours. Due to power grid fluctuations, the actual heater power ranged from approximately 1730 W to 1940 W. Based on linear regression of the data, the mean power output of the heater over the first 23.5 hours was 1853 W. After 23.5 hours, temperatures near the potting adapters of the thermocouple probes were such that the heater power had to be regulated to guarantee survival of the instruments. The set point on the feedback loop was therefore set to 250°C. Since the feedback thermocouple was already reading 273°C, this resulted in a short power-down cycle (approximately 1 hour) followed by a continuous regulation of the heater power for an additional 72.5 hours. Heater power was terminated when the temperature readings for all thermocouples on Probes 1, 2, 3, and 6 showed less than a 0.3°C/hr rate of change. Measurements of temperature continued for approximately 18 days following the termination of heater power. Figures 3-11 presents isothermal plots of the experimental data for Probes 1, 2, and 3 and the outer shell thermocouples at various times during Test 1. Complete heater power and thermocouple data from Test 1 are presented in Appendix A.

3.4 TEST 2

A second heating and cooling cycle of the test bed was completed prior to the dismantling of the experiment. The purpose of the second test was to obtain some temperature data over the time period between 5 and 13 hours of full-power heating. This time period corresponds to a failure in the Test 1 data acquisition system during which no temperature data were recorded. In addition, Test 2 was used as a means of developing a limited assessment of the reproducibility of the data obtained in the first experiment. Full power was applied to the heater for approximately 11.6 hours followed by 10.8 hours of regulated power. During the full-power cycle, power readings ranged from 1740 W to

```
*------------------------------------------------------------------*
|                                                                  |
|       W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
```

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 PRESS <CR> OR <ENTER> TO CONTINUE


         ***** ANSYS COMMAND LINE ARGUMENTS *****
  INITIAL JOBNAME            = seism5
  MEMORY REQUESTED (MB)      =     72.0
  BATCH MODE REQUESTED       = LIST
  START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.810   TIME= 16:21:40
There are no parameters and no abbreviations defined.

38303             VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism5    16:21:40  MAY 31, 1996 CP=      0.810

    1 /com,*************************************************************************
    2 /com,*************************************************************************
    3 /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4 /com,*****  Degree of Degradation in Outer Barrier:  0%                    *****
    5 /com,*****  Degree of Degradation in Inner Barrier:  0%                    *****
    6 /com,*****  Degree of Degradation in Basket Assembly:  0%                  *****
    7 /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
    8 /com,*************************************************************************
    9 /com,*************************************************************************
   10 !/config,nvpag,512
   11 /units,si
   12 /prep7
   13 /title, 21 PWR Tube Static Analysis With Backfill
   14 /vcon,,0
   15 /com, Define Parameters
   16 ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   17 obir=0.73095            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   18 obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   19 obor=0.83095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   20 ts1=.007                ! SS-B Plate Thickness
   21 ts2=.005                ! CS Tube Thickness
   22 ts3=.010                ! Corner Guide Thickness
   23 ts4=.010                ! End Guide Thickness
   24 egih=0.0809             ! End Guide Fin Inner Height
   25 pie=3.1415926           ! Pi
   26 ang1=30*pie/180         ! Angle on end of end guide
   27 ang2=80*pie/180         ! Angle on end of end guide fin
   28 ang3=58*pie/180         ! Angle on end of corner guide
   29 tw=0.2285               ! Tube Inner Side Width
   30 pos1=tw/2               ! Dimension to Keypoint Position 1
   31 pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   32 pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   33 pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   34 pos5=pos4+tw            ! Dimension to Keypoint Position 5
   35 pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   36 pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   37 pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   38 pos9=pos8+tw            ! Dimension to Keypoint Position 9
   39 pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   40 pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   41 posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   42 posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   43 poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   44 posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   45 posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   46 poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
   47 poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
   48 bkht=4.575              ! Basket Height
   49 ibht=4.585              ! inner barrier cavity height
   50 bgh=ibht-bkht           ! Basket Gap Height
```

```
iblt=0.025              ! inner lid height
elev1=ibht+iblt         ! Elevation of Top of Inner Barrier
ltlgh=0.030             ! Lid to Lid Gap Height
elev2=elev1+ltlgh       ! Elevation of Bottom of Upper Outer Barrier Lid
oblt=0.11               ! outer lid height
elev3=elev2+oblt        ! Elevation of Top of Upper Outer Barrier Lid
stht=0.225              ! skirt height
elev4=elev3+stht        ! Elevation of Top of Waste Package
elev5=-(iblt+oblt)      ! Elevation of Bottom of Lower Outer Barrier Lid
elev6=elev5-stht        ! Elevation of Bottom of Waste Package
/com, Line Divisions
shd=1             ! Skirt Height Divisions
obld=1            ! Outer Barrier Lid Divisions
gd=1              ! Gap Divisions
ibld=1            ! Inner Barrier Lid Divisions
bd=15             ! Basket Divisions
htwd=4            ! Half Tube Width Divisions
twd=4             ! Tube Width Divisions
thd=4             ! Tube Height Divisions
egfd=4            ! End Guide Fin Divisions
ptd=1             ! Plate Thickness Divisions
ttd=1             ! Tube Thickness Divisions
a1d=4             ! Arc 1 Divisions
a2d=4             ! Arc 2 Divisions
a3d=4             ! Arc 3 Divisions
a4d=4             ! Arc 4 Divisions
a5d=4             ! Arc 5 Divisions
a6d=4             ! Arc 6 Divisions
a7d=4             ! Arc 7 Divisions
a8d=4             ! Arc 8 Divisions
a9d=4             ! Arc 9 Divisions
ibtd=2            ! Inner Barrier Thickness Divisions
obitd=2           ! Outer Barrier Inner Thickness Divisions
std=2             ! Skirt Thickness Divisions
/com, Define Element Properties
et,1,solid45      ! Carbon Steel Tube
et,2,solid45      ! Stainless Steel - Boron Plate
et,3,solid45      ! Carbon Steel End Guide
et,4,solid45      ! Carbon Steel Corner Guide
et,5,solid45      ! Alloy 625 Inner Barrier
et,6,solid45      ! A 516 Carbon Steel Outer Barrier
et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
!et,7,contac49    ! Contact Between Basket and Inner Barrier
r,7,1.5e8,,,1.298,15  ! Real Constant Set for Contact, kn=1.5E8,
/com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
/com, Room Temperature Properties of Materials
mp,ex,1,206e9       ! A516 Carbon Steel Tube
mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
mp,ex,3,206e9       ! A516 Carbon Steel End Guide
mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
mp,ex,5,208e9       ! Alloy 625 Inner Barrier
mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
mp,nuxy,6,0.3       ! A516 Carbon Steel Outer Barrier
mp,nuxy,7,0.3       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
!mp,dens,1,44646.96      ! A516 Carbon Steel Tube (Adjusted density)
mp,dens,1,8131      ! A516 Carbon Steel Tube
mp,dens,2,7953      ! 316B6A Stainless Steel - Boron Plate
mp,dens,3,8131      ! A516 Carbon Steel End Guide
mp,dens,4,8131      ! A516 Carbon Steel Corner Guide
mp,dens,5,8442      ! Alloy 625 Inner Barrier
mp,dens,6,8131      ! A516 Carbon Steel Outer Barrier
mp,dens,7,20670     ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
!mp,mu,7,0.57       ! Coefficient of Friction (Steel on Steel Assumed)
!tb,biso,1
```

```
121 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
122 !tb,biso,2
123 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
124 !tb,biso,3
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
126 !tb,biso,4
127 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
128 !tb,biso,5
129 !tbdata,,379e6,1.271e9  ! Alloy 625
130 !tb,biso,6
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
132 !tb,biso,7
133 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
134 /com
135 /com, Define keypoints in the basket assembly
136 csys,0
137 k,1,0,0
138 k,2,pos1,0
139 k,3,pos2,0
140 k,4,pos3,0
141 k,5,pos4,0
142 k,6,pos5,0
143 k,7,pos6,0
144 k,8,pos7,0
145 k,9,pos8,0
146 k,10,pos9,0
147 k,11,pos10,0
148 k,12,pos11,0
149 k,13,pos1,pos1
150 k,14,pos4,pos1
151 k,15,pos5,pos1
152 k,16,pos8,pos1
153 k,17,pos9,pos1
154 k,18,pos2,pos2
155 k,19,pos3,pos2
156 k,20,pos6,pos2
157 k,21,pos7,pos2
158 k,22,pos10,pos2
159 k,23,pos11,posen
160 !k,24,posei,posen
161 csys,1
162 k,24,ibir,(180/pie)*atan(posen/posei)
163 csys,0
164 k,25,pos3,pos3
165 k,26,pos6,pos3
166 k,27,pos7,pos3
167 k,28,pos10,pos3
168 k,29,pos11,posef
169 !k,30,poseo,posef
170 csys,1
171 k,30,ibir,(180/pie)*atan(posef/poseo)
172 csys,0
173 k,31,pos4,pos4
174 k,32,pos5,pos4
175 k,33,pos8,pos4
176 k,34,pos9,pos4
177 k,35,pos5,pos5
178 k,36,pos8,pos5
179 k,37,pos9,pos5
180 !k,38,pos11,poseg
181 csys,1
182 k,38,ibir,(180/pie)*atan(poseg/pos11)
183 csys,0
184 k,39,pos6,pos6
185 k,40,pos7,pos6
186 !k,41,pos10,pos6
187 csys,1
188 k,41,ibir,(180/pie)*atan(pos6/pos10)
189 csys,0
190 k,42,posg,posg
```

```
191  !k,43,poscg,posg
192  csys,1
193  k,43,ibir,(180/pie)*atan(posg/poscg)
194  k,44,ibir,0
195  k,45,ibir,45
196  k,46,obir,0
197  k,47,obir,(180/pie)*atan(posen/posei)
198  k,48,obir,(180/pie)*atan(posef/poseo)
199  k,49,obir,(180/pie)*atan(poseg/pos11)
200  k,50,obir,(180/pie)*atan(pos6/pos10)
201  k,51,obir,(180/pie)*atan(posg/poscg)
202  k,52,obir,45
203  k,53,obsr,0
204  k,54,obsr,(180/pie)*atan(posen/posei)
205  k,55,obsr,(180/pie)*atan(posef/poseo)
206  k,56,obsr,(180/pie)*atan(poseg/pos11)
207  k,57,obsr,(180/pie)*atan(pos6/pos10)
208  k,58,obsr,(180/pie)*atan(posg/poscg)
209  k,59,obsr,45
210  k,60,obor,0
211  k,61,obor,(180/pie)*atan(posen/posei)
212  k,62,obor,(180/pie)*atan(posef/poseo)
213  k,63,obor,(180/pie)*atan(poseg/pos11)
214  k,64,obor,(180/pie)*atan(pos6/pos10)
215  k,65,obor,(180/pie)*atan(posg/poscg)
216  k,66,obor,45
217  local,11,0,0,0,0,45,0,0,
218  ksymm,y,all,,,0,0,0
219  nummrg,kp
220  csys,0
221  ksymm,y,all,,,0,0,0
222  nummrg,kp
223  kdel,2,12,1
224  k,1001,0,0,bkht
225  l,1,1001              ! Line 1 for VDRAG of Basket
226  lesize,all,,,bd,1,0
227  k,2001,0,0,ibht
228  l,1001,2001           ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
229  lesize,all,,,gd,1,0
230  k,3001,0,0,elev1
231  l,2001,3001           ! Line 3 for VDRAG of Inner Barrier Upper Lid
232  lesize,all,,,ibld,1,0
233  k,4001,0,0,elev2
234  l,3001,4001           ! Line 4 for VDRAG of Lid to Lid Gap
235  lesize,all,,,gd,1,0
236  k,5001,0,0,elev3
237  l,4001,5001           ! Line 5 for VDRAG of Outer Barrier Upper Lid
238  lesize,all,,,obld,1,0
239  k,6001,0,0,elev4
240  l,5001,6001           ! Line 6 for VDRAG of Upper Skirt
241  lesize,all,,,shd,1,0
242  k,7001,0,0,-iblt
243  l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
244  lesize,all,,,ibld,1,0
245  k,8001,0,0,elev5
246  l,7001,8001           ! Line 8 for VDRAG of OB Lower Lid
247  lesize,all,,,obld,1,0
248  k,9001,0,0,elev6
249  l,8001,9001           ! Line 9 for VDRAG of Lower Skirt
250  lesize,all,,,shd,1,0
251  /com, line set 1 Tube Width for Half Tubes on Symmetry Plane
252  L,     197,     206
253  L,     196,     205
254  L,     195,     201
255  L,     194,     200
256  L,     193,     204
257  L,     192,     203
258  L,     191,     199
259  L,     190,     198
260  L,     189,     202
```

```
261  L,      188,      138
262  L,      187,      133
263  L,       68,       13
264  L,       69,       18
265  L,       70,       85
266  L,       71,       80
267  L,       72,       81
268  L,       73,       86
269  L,       74,       87
270  L,       75,       82
271  L,       76,       83
272  L,       77,       88
273  L,       78,       89
274  lesize,all,,,htwd,1,0
275  /com, line set 2 Tube Widths
276  L,      211,      218
277  L,      210,      220
278  L,      215,      217
279  L,      214,      216
280  L,      209,      219
281  L,      208,      159
282  L,      213,      155
283  L,      151,      152
284  L,      145,      146
285  L,      139,      140
286  L,      134,      135
287  L,       14,       15
288  L,       19,       20
289  L,       25,       26
290  L,       31,       32
291  L,       98,       35
292  L,       92,       39
293  L,       93,      106
294  L,       99,      102
295  L,      100,      103
296  L,       94,      107
297  L,       95,      104
298  lesize,all,,,twd,1,0
299  /com, line set 3 Tube Widths on End Column
300  L,      162,      163
301  L,      160,      161
302  L,      156,      157
303  L,      153,      154
304  L,      147,      148
305  L,      141,      142
306  L,      136,      137
307  L,       16,       17
308  L,       21,       22
309  L,       27,       28
310  L,       33,       34
311  L,       36,       37
312  L,       40,       41
313  L,       42,       43
314  lesize,all,,,twd,1,0
315  /com, line set 4 Tube Heights
316  L,      201,      200
317  L,      205,      204
318  L,      210,      209
319  L,      215,      214
320  L,      217,      216
321  L,      220,      219
322  L,      221,      162
323  L,      199,      198
324  L,      203,      202
325  L,      208,      145
326  L,      213,      151
327  L,      155,      152
328  L,      159,      146
329  L,      160,      147
330  L,      156,      153
```

```
  331 L,      157,      154
  332 L,      161,      148
  333 L,      133,       13
  334 L,      138,       18
  335 L,      139,       19
  336 L,      134,       14
  337 L,      135,       15
  338 L,      140,       20
  339 L,      141,       21
  340 L,      136,       16
  341 L,      137,       17
  342 L,      142,       22
  343 L,      143,       23
  344 L,       80,       81
  345 L,       85,       86
  346 L,       25,       92
  347 L,       31,       98
  348 L,       32,       35
  349 L,       26,       39
  350 L,       27,       40
  351 L,       33,       36
  352 L,       34,       37
  353 L,       28,       41
  354 L,       29,       38
  355 L,       82,       83
  356 L,       87,       88
  357 L,       93,       94
  358 L,       99,      100
  359 L,      102,      103
  360 L,      106,      107
  361 L,       42,      109
  362 L,      158,      149
  363 lesize,all,,,thd,1,0
  364 /com, line set 5 End Guide Fins
  365 L,      207,      206
  366 L,      212,      211
  367 L,      150,      149
  368 L,      144,      143
  369 L,       24,       23
  370 L,       30,       29
  371 L,       96,       95
  372 L,       90,       89
  373 lesize,all,,,egfd,1,0
  374 /com, line set 6 SS-B Plate Thickness
  375 L,      197,      196
  376 L,      206,      205
  377 L,      211,      210
  378 L,      207,      212
  379 L,      206,      211
  380 L,      205,      210
  381 L,      218,      220
  382 L,      220,      221
  383 L,      193,      192
  384 L,      204,      203
  385 L,      209,      208
  386 L,      204,      209
  387 L,      203,      208
  388 L,      219,      159
  389 L,      162,      160
  390 L,      163,      161
  391 L,      161,      158
  392 L,      219,      162
  393 L,      159,      160
  394 L,      189,      188
  395 L,      202,      138
  396 L,      145,      139
  397 L,      202,      145
  398 L,      138,      139
  399 L,      146,      140
  400 L,      147,      141
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401  L,    146,    147
402  L,    140,    141
403  L,    148,    142
404  L,    149,    143
405  L,    148,    149
406  L,    142,    143
407  L,    150,    144
408  L,     69,     70
409  L,     18,     85
410  L,     19,     25
411  L,     18,     19
412  L,     85,     25
413  L,     20,     26
414  L,     21,     27
415  L,     20,     21
416  L,     26,     27
417  L,     22,     28
418  L,     22,     23
419  L,     28,     29
420  L,     23,     29
421  L,     24,     30
422  L,     73,     74
423  L,     86,     87
424  L,     92,     93
425  L,     86,     92
426  L,     87,     93
427  L,     39,    106
428  L,     40,     42
429  L,     39,     40
430  L,    106,     42
431  L,     38,     41
432  L,     41,     43
433  L,     77,     78
434  L,     88,     89
435  L,     94,     95
436  L,     88,     94
437  L,     89,     95
438  L,     90,     96
439  L,    109,    107
440  L,    107,    104
441  L,    224,    225
442  L,    230,    231
443  L,    236,    237
444  L,    226,    227
445  L,    227,    228
446  L,    232,    233
447  L,    233,    234
448  L,    238,    239
449  L,    239,    240
450  L,    171,    170
451  L,    170,    169
452  L,    178,    177
453  L,    177,    176
454  L,    185,    184
455  L,    184,    183
456  L,    168,    167
457  L,    175,    174
458  L,    182,    181
459  L,     47,     48
460  L,     54,     55
461  L,     61,     62
462  L,     49,     50
463  L,     50,     51
464  L,     56,     57
465  L,     57,     58
466  L,     63,     64
467  L,     64,     65
468  L,    117,    116
469  L,    116,    115
470  L,    124,    123
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 471  L,      123,      122
 472  L,      131,      130
 473  L,      130,      129
 474  L,      114,      113
 475  L,      121,      120
 476  L,      128,      127
 477  lesize,all,,,ptd,1,0
 478  /com, line set 7 tube thickness
 479  L,      196,      195
 480  L,      205,      201
 481  L,      204,      200
 482  L,      193,      194
 483  L,      210,      215
 484  L,      220,      217
 485  L,      219,      216
 486  L,      209,      214
 487  L,      192,      191
 488  L,      203,      199
 489  L,      202,      198
 490  L,      189,      190
 491  L,      208,      213
 492  L,      159,      155
 493  L,      146,      152
 494  L,      145,      151
 495  L,      160,      156
 496  L,      161,      157
 497  L,      148,      154
 498  L,      147,      153
 499  L,      188,      187
 500  L,      138,      133
 501  L,       18,       13
 502  L,       69,       68
 503  L,      139,      134
 504  L,      140,      135
 505  L,       20,       15
 506  L,       19,       14
 507  L,      141,      136
 508  L,      142,      137
 509  L,       22,       17
 510  L,       21,       16
 511  L,       70,       71
 512  L,       85,       80
 513  L,       86,       81
 514  L,       73,       72
 515  L,       25,       31
 516  L,       26,       32
 517  L,       39,       35
 518  L,       92,       98
 519  L,       27,       33
 520  L,       28,       34
 521  L,       41,       37
 522  L,       40,       36
 523  L,       74,       75
 524  L,       87,       82
 525  L,       88,       83
 526  L,       77,       76
 527  L,       93,       99
 528  L,      106,      102
 529  L,      107,      103
 530  L,       94,      100
 531  lesize,all,,,ttd,1,0
 532  csys,1
 533  /com, line set 8, arc 1 bottom
 534  L,      222,      207
 535  L,      223,      224
 536  L,      229,      230
 537  L,      235,      236
 538  lesize,all,,,a1d,1,0
 539  /com, line set 9, arc 2 side arcs
 540  L,      212,      218
```

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L,     225,     226
L,     231,     232
L,     237,     238
lesize,all,,,a2d,1,0
/com, line set 10, arc 3 side arcs
L,     221,     163
L,     228,     171
L,     234,     178
L,     240,     185
lesize,all,,,a3d,1,0
/com, line set 11, arc 4 side arcs
L,     158,     150
L,     169,     168
L,     176,     175
L,     183,     182
lesize,all,,,a4d,1,0
/com, line set 12, arc 5 side arcs
L,     144,      24
L,     167,      47
L,     174,      54
L,     181,      61
lesize,all,,,a5d,1,0
/com, line set 13, arc 6 side arcs
L,      30,      38
L,      48,      49
L,      55,      56
L,      62,      63
lesize,all,,,a6d,1,0
/com, line set 14, arc 7 side arcs
L,      43,     109
L,      51,     117
L,      58,     124
L,      65,     131
lesize,all,,,a7d,1,0
/com, line set 15, arc 8 side arcs
L,     104,      96
L,     115,     114
L,     122,     121
L,     129,     128
lesize,all,,,a8d,1,0
/com, line set 16, arc 9 top arcs
L,      90,     110
L,     113,     112
L,     120,     119
L,     127,     126
lesize,all,,,a9d,1,0
csys,0
/com, line set 17 IB thickness
L,     222,     223
L,     207,     224
L,     212,     225
L,     218,     226
L,     220,     227
L,     221,     228
L,     163,     171
L,     161,     170
L,     158,     169
L,     150,     168
L,     144,     167
L,      24,      47
L,      30,      48
L,      38,      49
L,      41,      50
L,      43,      51
L,     109,     117
L,     107,     116
L,     104,     115
L,      96,     114
L,      90,     113
L,     110,     112
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611 lesize,all,,,ibtd,1,0
612 /com, line set 18 OB inner thickness
613 L,     223,     229
614 L,     224,     230
615 L,     225,     231
616 L,     226,     232
617 L,     227,     233
618 L,     228,     234
619 L,     171,     178
620 L,     170,     177
621 L,     169,     176
622 L,     168,     175
623 L,     167,     174
624 L,      47,      54
625 L,      48,      55
626 L,      49,      56
627 L,      50,      57
628 L,      51,      58
629 L,     117,     124
630 L,     116,     123
631 L,     115,     122
632 L,     114,     121
633 L,     113,     120
634 L,     112,     119
635 lesize,all,,,obitd,1,0
636 /com, line set 19 skirt thickness
637 L,     229,     235
638 L,     230,     236
639 L,     231,     237
640 L,     232,     238
641 L,     233,     239
642 L,     234,     240
643 L,     178,     185
644 L,     177,     184
645 L,     176,     183
646 L,     175,     182
647 L,     174,     181
648 L,      54,      61
649 L,      55,      62
650 L,      56,      63
651 L,      57,      64
652 L,      58,      65
653 L,     124,     131
654 L,     123,     130
655 L,     122,     129
656 L,     121,     128
657 L,     120,     127
658 L,     119,     126
659 lesize,all,,,std,1,0
660 /com, area set 1, tubes
661 a,195,196,205,201
662 a,200,201,205,204
663 a,193,194,200,204
664 a,191,192,203,199
665 a,198,199,203,202
666 a,189,190,198,202
667 a,187,188,138,133
668 a,133,138,18,13
669 a,69,68,13,18
670 a,71,70,85,80
671 a,80,85,86,81
672 a,73,72,81,86
673 a,75,74,87,82
674 a,82,87,88,83
675 a,77,76,83,88
676 a,209,210,215,214
677 a,215,210,220,217
678 a,216,217,220,219
679 a,209,214,216,219
680 a,145,208,213,151
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a,213,208,159,155
a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
a,205,206,211,210
a,206,207,212,211
a,210,211,218,220
a,148,161,158,149
a,142,148,149,143
a,143,149,150,144
a,22,142,143,23
a,28,22,23,29
a,29,23,24,30
a,41,28,29,38
a,95,94,107,104
a,89,88,94,95
a,90,89,95,96
a,78,77,88,89
/com, area set 4, corner guides
a,219,220,221,162
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a,159,219,162,160
a,160,162,163,161
a,107,106,42,109
a,106,39,40,42
a,42,40,41,43
csys,1
/com, area set 5, inner barrier
a,222,223,224,207
a,207,224,225,212
a,212,225,226,218
a,218,226,227,220
a,220,227,228,221
a,221,228,171,163
a,163,171,170,161
a,161,170,169,158
a,158,169,168,150
a,150,168,167,144
a,144,167,47,24
a,24,47,48,30
a,30,48,49,38
a,38,49,50,41
a,41,50,51,43
a,43,51,117,109
a,109,117,116,107
a,107,116,115,104
a,104,115,114,96
a,90,96,114,113
a,90,113,112,110
/com, area set 6, outer barrier
a,223,229,230,224
a,224,230,231,225
a,225,231,232,226
a,226,232,233,227
a,227,233,234,228
a,228,234,178,171
a,171,178,177,170
a,170,177,176,169
a,169,176,175,168
a,168,175,174,167
a,167,174,54,47
a,47,54,55,48
a,48,55,56,49
a,49,56,57,50
a,50,57,58,51
a,51,58,124,117
a,117,124,123,116
a,116,123,122,115
a,115,122,121,114
a,114,121,120,113
a,113,120,119,112
a,229,235,236,230
a,236,237,231,230
a,231,237,238,232
a,238,239,233,232
a,239,240,234,233
a,240,185,178,234
a,185,184,177,178
a,184,183,176,177
a,176,183,182,175
a,175,182,181,174
a,174,181,61,54
a,54,61,62,55
a,55,62,63,56
a,56,63,64,57
a,57,64,65,58
a,58,65,131,124
a,124,131,130,123
a,123,130,129,122
a,122,129,128,121
a,121,128,127,120
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a,120,127,126,119
csys,0
vdrag,all,,,,,,1          ! Drag Basket
asel,s,loc,z,bkht
csys,1
asel,u,loc,x,0,ibir-0.03
csys,0
vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
asel,s,loc,z,ibht+0.02
/com, copy areas from top of basket to bottom of lid
asel,s,loc,z,bkht-0.02
csys,1
asel,r,loc,x,0,ibir-0.03
csys,0
agen,2,all,,,,,bgh
nummrg,kp
/com, lines tube height
L,      502,      509
L,      510,      517
L,      518,      525
L,      526,      533
L,      534,      541
lesize,all,,,thd,1,0
/com, end lines
L,      627,      457
L,      414,      606
lesize,all,,,egfd,1,0
al,955,1369,1373,1396
al,1189,1190,1194,1374
al,1199,1200,1204,1377
al,1209,1212,1214,1378
al,1219,1222,1224,1384
al,1229,1232,1234,1391
al,1055,1394,1400,1404
al,965,1375,1376
al,1238,1242,1243,1246
al,1250,1254,1255,1258
al,1263,1266,1268,1271
al,1274,1278,1281,1282
al,1286,1290,1293,1294
al,1045,1397,1401
al,980,1406,1409
al,1299,1302,1304,1307
al,1311,1314,1316,1319
al,1323,1326,1328,1331
al,1030,1412,1416
al,995,1379,1383
al,1005,1385,1386,1390
al,1015,1392,1393
asel,s,loc,z,ibht+0.02
vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
asel,s,loc,z,elev1+0.015
csys,1
asel,r,loc,x,obir,obor
csys,0
vdrag,all,,,,,,4          ! Drag Lid to Lid Gap
asel,s,loc,z,elev1+0.015
asel,r,loc,z,elev1-0.015
csys,1
asel,r,loc,x,0,obir
csys,0
agen,2,all,,,,,ltlgh
nummrg,kp
asel,s,loc,z,elev2+0.015
vdrag,all,,,,,,5          ! Drag Outer Barrier Upper Lid
asel,s,loc,z,elev3
csys,1
asel,r,loc,x,obsr,obor
csys,0
vdrag,all,,,,,,6          ! Drag Upper Skirt
```

```
/com, lines tube height
l,195,194
l,191,190
l,187,68
l,71,72
l,75,76
lesize,all,,,thd,1,0
/com, end lines
l,222,197
l,78,110
lesize,all,,,egfd,1,0
al,10,115,277,3119
al,12,13,68,3114
al,16,17,75,3115
al,20,21,85,3116
al,24,25,96,3117
al,28,29,107,3118
al,31,122,309,3120
al,32,116,281
al,34,35,71,72
al,38,39,78,79
al,42,43,88,89
al,46,47,99,100
al,50,51,110,111
al,53,121,305
al,54,74,285
al,56,57,82,83
al,60,61,92,93
al,64,65,103,104
al,67,113,301
al,114,117,289
al,95,118,119,293
al,106,120,297
asel,s,loc,z,0
vdrag,all,,,,,7          ! Drag Inner Barrier Lower Lid
csys,0
asel,s,loc,z,-iblt
vdrag,all,,,,,8          ! Drag Outer Barrier Lower Lid
asel,s,loc,z,elev5
csys,1
asel,r,loc,x,obsr,obor
csys,0
vdrag,all,,,,,9          ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
vsel,s,volu,,1,47
type,1
mat,1
vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,-iblt,elev1
csys,1
```

```
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
vsel,inve
vsel,u,volu,,1,92
csys,1
vsel,u,loc,x,obir,obor
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,type,,5
type,6
mat,6
vmesh,all
/com, mesh upper outer barrier adding backfill mass
vsel,inve
vsel,u,type,,1,5
type,7
mat,7
vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(3*bkht/bd)-0.01,(4*bkht/bd)+0.01
nsel,a,loc,z,(11*bkht/bd)-0.01,(12*bkht/bd)+0.01
nsel,r,loc,x,obor-0.001,obor+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,1
outres,all,1
save
solve
fini


/exit
/eof


/sol
expass,on
mxpand,8,,,yes
solve
fini

/sol
antype,spectr
spopt,sprs,,on
sed,,1
svtyp,2
freq,0.1,100
sv,,16.285,16.285
mcomb,srss,1e-8
outres,all,1
save
```

```
 1031  solve
 1032  fini
 1033  /exit
 1034  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,

ABBREVIATION= PR0       /psf,pres,norm,0,

ABBREVIATION= U1        /pbc,u,1,
```

```
 ABBREVIATION= UO        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************
 ************************************************************************
 ************************************************************************
 *****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
 *****  Degree of Degradation in Outer Barrier:  0%                    *****
 *****  Degree of Degradation in Inner Barrier:  0%                    *****
 *****  Degree of Degradation in Basket Assembly:  0%                  *****
 *****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
 ************************************************************************
 ************************************************************************

 SI UNITS SPECIFIED FOR INTERNAL
  LENGTH         (l)  = METER(M)
  MASS           (M)  = KILOGRAM(KG)
  TIME           (t)  = SECOND(SEC)
  TEMPERATURE    (T)  = KELVIN(K)
  TOFFSET             = 0.0 KELVIN
  CHARGE         (Q)  = COULOMB
  CURRENT        (i)  = AMPERE (COULOMBS/SEC)
  FORCE          (f)  = NEWTON(N) (KG-M/SEC2)
  PRESSURE            = PASCAL (NEWTON/M**2)
  ENERGY         (W)  = JOULE (N-M)
  POWER          (P)  = WATT (N-M/SEC)
  CAPACITANCE    (C)  = FARAD
  INDUCTANCE     (L)  = HENRY
  MAGNETIC FLUX       = WEBER
  RESISTANCE     (R)  = OHM
  ELECTRIC POTENTIAL = VOLT

 INPUT UNITS ARE ALSO SET TO SI
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   16:21:40  MAY 31, 1996 CP=      1.020
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844



         ***** ANSYS ANALYSIS DEFINITION (PREP7) *****

 TITLE=
  21 PWR Tube Static Analysis With Backfill


 VIEW CONE ANGLE FOR WINDOW  1    0.00
```

Define Parameters

PARAMETER IBIR = 0.7109500

PARAMETER OBIR = 0.7309500

PARAMETER OBSR = 0.7709500

PARAMETER OBOR = 0.8309500

PARAMETER TS1 = 0.7000000E-02

PARAMETER TS2 = 0.5000000E-02

PARAMETER TS3 = 0.1000000E-01

PARAMETER TS4 = 0.1000000E-01

PARAMETER EGIH = 0.8090000E-01

PARAMETER PIE = 3.141593

PARAMETER ANG1 = 0.5235988

PARAMETER ANG2 = 1.396263

PARAMETER ANG3 = 1.012291

PARAMETER TW = 0.2285000

PARAMETER POS1 = 0.1142500

PARAMETER POS2 = 0.1192500

PARAMETER POS3 = 0.1262500

PARAMETER POS4 = 0.1312500

PARAMETER POS5 = 0.3597500

PARAMETER POS6 = 0.3647500

PARAMETER POS7 = 0.3717500

PARAMETER POS8 = 0.3767500

PARAMETER POS9 = 0.6052500

PARAMETER POS10 = 0.6102500

PARAMETER POS11 = 0.6202500

PARAMETER POSG = 0.3747500

PARAMETER POSEI = 0.7011500

PARAMETER POSEO = 0.6993867

PARAMETER POSEN = 0.1177500

PARAMETER POSEF = 0.1277500

PARAMETER POSEG = 0.3474295

PARAMETER POSCG = 0.6040013

PARAMETER BKHT = 4.575000

PARAMETER IBHT = 4.585000

PARAMETER BGH = 0.1000000E-01

PARAMETER IBLT = 0.2500000E-01

PARAMETER ELEV1 = 4.610000

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 4.640000

PARAMETER OBLT = 0.1100000

PARAMETER ELEV3 = 4.750000

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 4.975000

PARAMETER ELEV5 = -0.1350000

PARAMETER ELEV6 = -0.3600000

Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 1.000000

PARAMETER IBLD = 1.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 1.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

PARAMETER A3D = 4.000000

PARAMETER A4D = 4.000000

PARAMETER A5D = 4.000000

PARAMETER A6D = 4.000000

PARAMETER A7D = 4.000000

PARAMETER A8D = 4.000000

PARAMETER A9D = 4.000000

PARAMETER IBTD = 2.000000

PARAMETER OBITD = 2.000000

PARAMETER STD = 2.000000

Define Element Properties

```
ELEMENT TYPE     1 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     2 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     3 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     4 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     5 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     6 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

ELEMENT TYPE     7 IS SOLID45      3-D STRUCTURAL SOLID
 KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

CURRENT NODAL DOF SET IS  UX    UY    UZ
 THREE-DIMENSIONAL MODEL

REAL CONSTANT SET       7  ITEMS    1 TO    6
  0.15000E+09  0.00000E+00  0.00000E+00   1.2980       15.000       0.00000E+00
 ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
 Room Temperature Properties of Materials

MATERIAL    1          EX   =   0.2060000E+12

MATERIAL    2          EX   =   0.1950000E+12

MATERIAL    3          EX   =   0.2060000E+12

MATERIAL    4          EX   =   0.2060000E+12

MATERIAL    5          EX   =   0.2080000E+12

MATERIAL    6          EX   =   0.2060000E+12

MATERIAL    7          EX   =   0.2060000E+12

MATERIAL    1          NUXY =   0.3000000

MATERIAL    2          NUXY =   0.2980000

MATERIAL    3          NUXY =   0.3000000

MATERIAL    4          NUXY =   0.3000000

MATERIAL    5          NUXY =   0.2780000
```

```
MATERIAL    6          NUXY =    0.3000000
MATERIAL    7          NUXY =    0.3000000
MATERIAL    1          DENS =     8131.000
MATERIAL    2          DENS =     7953.000
MATERIAL    3          DENS =     8131.000
MATERIAL    4          DENS =     8131.000
MATERIAL    5          DENS =     8442.000
MATERIAL    6          DENS =     8131.000
MATERIAL    7          DENS =     20670.00
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1   X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2   X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3   X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4   X,Y,Z=  0.126250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5   X,Y,Z=  0.131250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6   X,Y,Z=  0.359750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7   X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8   X,Y,Z=  0.371750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9   X,Y,Z=  0.376750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10   X,Y,Z=  0.605250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11   X,Y,Z=  0.610250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12   X,Y,Z=  0.620250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13   X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14   X,Y,Z=  0.131250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15   X,Y,Z=  0.359750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16   X,Y,Z=  0.376750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17   X,Y,Z=  0.605250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18   X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19   X,Y,Z=  0.126250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20   X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     21   X,Y,Z=  0.371750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     22   X,Y,Z=  0.610250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     23   X,Y,Z=  0.620250      0.117750      0.000000E+00  IN CSYS=  0
ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

```
KEYPOINT     24   X,Y,Z=  0.710950       9.53320       0.000000E+00  IN CSYS=  1
                          0.701132      0.117747       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     25   X,Y,Z=  0.126250      0.126250       0.000000E+00  IN CSYS=  0
KEYPOINT     26   X,Y,Z=  0.364750      0.126250       0.000000E+00  IN CSYS=  0
KEYPOINT     27   X,Y,Z=  0.371750      0.126250       0.000000E+00  IN CSYS=  0
KEYPOINT     28   X,Y,Z=  0.610250      0.126250       0.000000E+00  IN CSYS=  0
KEYPOINT     29   X,Y,Z=  0.620250      0.127750       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     30   X,Y,Z=  0.710950       10.3515       0.000000E+00  IN CSYS=  1
                          0.699378      0.127748       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     31   X,Y,Z=  0.131250      0.131250       0.000000E+00  IN CSYS=  0
KEYPOINT     32   X,Y,Z=  0.359750      0.131250       0.000000E+00  IN CSYS=  0
KEYPOINT     33   X,Y,Z=  0.376750      0.131250       0.000000E+00  IN CSYS=  0
KEYPOINT     34   X,Y,Z=  0.605250      0.131250       0.000000E+00  IN CSYS=  0
KEYPOINT     35   X,Y,Z=  0.359750      0.359750       0.000000E+00  IN CSYS=  0
KEYPOINT     36   X,Y,Z=  0.376750      0.359750       0.000000E+00  IN CSYS=  0
KEYPOINT     37   X,Y,Z=  0.605250      0.359750       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     38   X,Y,Z=  0.710950       29.2551       0.000000E+00  IN CSYS=  1
                          0.620270      0.347441       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     39   X,Y,Z=  0.364750      0.364750       0.000000E+00  IN CSYS=  0
KEYPOINT     40   X,Y,Z=  0.371750      0.364750       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     41   X,Y,Z=  0.710950       30.8670       0.000000E+00  IN CSYS=  1
                          0.610251      0.364751       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT     42   X,Y,Z=  0.374750      0.374750       0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
KEYPOINT     43   X,Y,Z=  0.710950       31.8174       0.000000E+00  IN CSYS=  1
                          0.604118      0.374822       0.000000E+00  IN CSYS=  0
KEYPOINT     44   X,Y,Z=  0.710950      0.000000E+00   0.000000E+00  IN CSYS=  1
                          0.710950      0.000000E+00   0.000000E+00  IN CSYS=  0
```

KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0
KEYPOINT 46 X,Y,Z= 0.730950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.730950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 47 X,Y,Z= 0.730950 9.53320 0.000000E+00 IN CSYS= 1
0.720855 0.121059 0.000000E+00 IN CSYS= 0
KEYPOINT 48 X,Y,Z= 0.730950 10.3515 0.000000E+00 IN CSYS= 1
0.719053 0.131342 0.000000E+00 IN CSYS= 0
KEYPOINT 49 X,Y,Z= 0.730950 29.2551 0.000000E+00 IN CSYS= 1
0.637719 0.357215 0.000000E+00 IN CSYS= 0
KEYPOINT 50 X,Y,Z= 0.730950 30.8670 0.000000E+00 IN CSYS= 1
0.627419 0.375012 0.000000E+00 IN CSYS= 0
KEYPOINT 51 X,Y,Z= 0.730950 31.8174 0.000000E+00 IN CSYS= 1
0.621112 0.385366 0.000000E+00 IN CSYS= 0
KEYPOINT 52 X,Y,Z= 0.730950 45.0000 0.000000E+00 IN CSYS= 1
0.516860 0.516860 0.000000E+00 IN CSYS= 0
KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 54 X,Y,Z= 0.770950 9.53320 0.000000E+00 IN CSYS= 1
0.760303 0.127684 0.000000E+00 IN CSYS= 0
KEYPOINT 55 X,Y,Z= 0.770950 10.3515 0.000000E+00 IN CSYS= 1
0.758402 0.138530 0.000000E+00 IN CSYS= 0
KEYPOINT 56 X,Y,Z= 0.770950 29.2551 0.000000E+00 IN CSYS= 1
0.672617 0.376763 0.000000E+00 IN CSYS= 0
KEYPOINT 57 X,Y,Z= 0.770950 30.8670 0.000000E+00 IN CSYS= 1
0.661753 0.395534 0.000000E+00 IN CSYS= 0
KEYPOINT 58 X,Y,Z= 0.770950 31.8174 0.000000E+00 IN CSYS= 1
0.655102 0.406455 0.000000E+00 IN CSYS= 0
KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0
KEYPOINT 60 X,Y,Z= 0.830950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.830950 0.000000E+00 0.000000E+00 IN CSYS= 0
KEYPOINT 61 X,Y,Z= 0.830950 9.53320 0.000000E+00 IN CSYS= 1
0.819474 0.137621 0.000000E+00 IN CSYS= 0
KEYPOINT 62 X,Y,Z= 0.830950 10.3515 0.000000E+00 IN CSYS= 1

```
                      0.817425      0.149311      0.000000E+00  IN CSYS=  0

KEYPOINT     63   X,Y,Z=  0.830950       29.2551       0.000000E+00  IN CSYS=  1

                      0.724964      0.406085      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.830950       30.8670       0.000000E+00  IN CSYS=  1

                      0.713255      0.426316      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.830950       31.8174       0.000000E+00  IN CSYS=  1

                      0.706086      0.438088      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.830950       45.0000       0.000000E+00  IN CSYS=  1

                      0.587570      0.587570      0.000000E+00  IN CSYS=  0

COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
  XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
  ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
  ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT     13 USED FOR KEYPOINT(S)      79
KEYPOINT     18 USED FOR KEYPOINT(S)      84
KEYPOINT     25 USED FOR KEYPOINT(S)      91
KEYPOINT     31 USED FOR KEYPOINT(S)      97
KEYPOINT     35 USED FOR KEYPOINT(S)     101
KEYPOINT     39 USED FOR KEYPOINT(S)     105
KEYPOINT     42 USED FOR KEYPOINT(S)     108
KEYPOINT     45 USED FOR KEYPOINT(S)     111
KEYPOINT     52 USED FOR KEYPOINT(S)     118
KEYPOINT     59 USED FOR KEYPOINT(S)     125
KEYPOINT     66 USED FOR KEYPOINT(S)     132

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT      2 USED FOR KEYPOINT(S)      79
KEYPOINT      3 USED FOR KEYPOINT(S)      84
KEYPOINT      4 USED FOR KEYPOINT(S)      91
KEYPOINT      5 USED FOR KEYPOINT(S)      97
KEYPOINT      6 USED FOR KEYPOINT(S)     101
KEYPOINT      7 USED FOR KEYPOINT(S)     105
KEYPOINT      8 USED FOR KEYPOINT(S)     108
KEYPOINT      9 USED FOR KEYPOINT(S)     111
KEYPOINT     10 USED FOR KEYPOINT(S)     118
KEYPOINT     11 USED FOR KEYPOINT(S)     125
KEYPOINT     12 USED FOR KEYPOINT(S)     132
KEYPOINT     44 USED FOR KEYPOINT(S)     164
KEYPOINT     46 USED FOR KEYPOINT(S)     166
KEYPOINT     53 USED FOR KEYPOINT(S)     173
KEYPOINT     60 USED FOR KEYPOINT(S)     180

DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   4.57500      IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS      1  1001
 LINE NO.=     1  KP1=      1  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   1001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =   15,  SPACING RATIO =   1.000

KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   4.58500      IN CSYS=  0

LINE CONNECTS KEYPOINTS   1001  2001
 LINE NO.=     2  KP1=   1001  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   2001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   4.61000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   2001  3001
 LINE NO.=     3  KP1=   2001  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   3001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   4.64000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   3001  4001
 LINE NO.=     4  KP1=   3001  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   4001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   4.75000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   4001  5001
 LINE NO.=     5  KP1=   4001  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   5001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   4.97500      IN CSYS=  0

LINE CONNECTS KEYPOINTS   5001  6001
 LINE NO.=     6  KP1=   5001  TAN1=    0.0000    0.0000  -1.0000
                  KP2=   6001  TAN2=    0.0000    0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.250000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  7001
 LINE NO.=     7  KP1=      1  TAN1=    0.0000    0.0000   1.0000
                  KP2=   7001  TAN2=    0.0000    0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.135000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000    0.0000   1.0000
                  KP2=   8001  TAN2=    0.0000    0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
```

```
KEYPOINT    9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.360000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000
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```
LINE CONNECTS KEYPOINTS     72    81
 LINE NO.=     25  KP1=     72  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     81  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=     26  KP1=     73  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     86  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=     27  KP1=     74  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     87  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=     28  KP1=     75  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     82  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=     29  KP1=     76  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     83  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=     30  KP1=     77  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     88  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=     31  KP1=     78  TAN1=   -1.0000    0.0000    0.0000
                   KP2=     89  TAN2=    1.0000    0.0000    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=     32  KP1=    211  TAN1=   -1.0000    0.0001    0.0000
                   KP2=    218  TAN2=    1.0000   -0.0001    0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=     33  KP1=    210  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    220  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=     34  KP1=    215  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    217  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=     35  KP1=    214  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    216  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=     36  KP1=    209  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    219  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=     37  KP1=    208  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    159  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=     38  KP1=    213  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    155  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=     39  KP1=    151  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    152  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    145   146
 LINE NO.=     40  KP1=    145  TAN1=   -1.0000    0.0000    0.0000
                   KP2=    146  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    139   140
 LINE NO.=     41  KP1=    139  TAN1=   -1.0000    0.0000    0.0000
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                KP2=    140  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    134   135
  LINE NO.=     42  KP1=    134  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    135  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     14    15
  LINE NO.=     43  KP1=     14  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     15  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     19    20
  LINE NO.=     44  KP1=     19  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     20  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     25    26
  LINE NO.=     45  KP1=     25  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     26  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     31    32
  LINE NO.=     46  KP1=     31  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     32  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     98    35
  LINE NO.=     47  KP1=     98  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     35  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     92    39
  LINE NO.=     48  KP1=     92  TAN1=   -1.0000    0.0000    0.0000
                    KP2=     39  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     93   106
  LINE NO.=     49  KP1=     93  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    106  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     99   102
  LINE NO.=     50  KP1=     99  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    102  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    100   103
  LINE NO.=     51  KP1=    100  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    103  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     94   107
  LINE NO.=     52  KP1=     94  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    107  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS     95   104
  LINE NO.=     53  KP1=     95  TAN1=   -1.0000   -0.0001    0.0000
                    KP2=    104  TAN2=    1.0000    0.0001    0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     4,  SPACING RATIO =    1.000
  Line set 3 Tube Widths on End Column

 LINE CONNECTS KEYPOINTS    162   163
  LINE NO.=     54  KP1=    162  TAN1=   -1.0000    0.0003    0.0000
                    KP2=    163  TAN2=    1.0000   -0.0003    0.0000

 LINE CONNECTS KEYPOINTS    160   161
  LINE NO.=     55  KP1=    160  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    161  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    156   157
  LINE NO.=     56  KP1=    156  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    157  TAN2=    1.0000    0.0000    0.0000

 LINE CONNECTS KEYPOINTS    153   154
  LINE NO.=     57  KP1=    153  TAN1=   -1.0000    0.0000    0.0000
                    KP2=    154  TAN2=    1.0000    0.0000    0.0000
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LINE CONNECTS KEYPOINTS    147   148
 LINE NO.=    58  KP1=     147  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     148  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=     141  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     142  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=     136  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     137  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=      16  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      17  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=      21  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      22  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=      27  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      28  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=      33  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      34  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=      36  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      37  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=      40  TAN1=   -1.0000   0.0000   0.0000
                  KP2=      41  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=      42  TAN1=   -1.0000  -0.0003   0.0000
                  KP2=      43  TAN2=    1.0000   0.0003   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=     201  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     200  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=     205  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     204  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=     210  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     209  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=     215  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     214  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=     217  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     216  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=     220  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     219  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=     221  TAN1=    0.0003  -1.0000   0.0000
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                KP2=    162  TAN2=   -0.0003   1.0000   0.0000

LINE CONNECTS KEYPOINTS   199   198
 LINE NO.=    75  KP1=    199  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    198  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   203   202
 LINE NO.=    76  KP1=    203  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    202  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   208   145
 LINE NO.=    77  KP1=    208  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    145  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   213   151
 LINE NO.=    78  KP1=    213  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    151  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   155   152
 LINE NO.=    79  KP1=    155  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    152  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   159   146
 LINE NO.=    80  KP1=    159  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    146  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   160   147
 LINE NO.=    81  KP1=    160  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    147  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   156   153
 LINE NO.=    82  KP1=    156  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    153  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   157   154
 LINE NO.=    83  KP1=    157  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    154  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   161   148
 LINE NO.=    84  KP1=    161  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    148  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   133    13
 LINE NO.=    85  KP1=    133  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     13  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   138    18
 LINE NO.=    86  KP1=    138  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     18  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   139    19
 LINE NO.=    87  KP1=    139  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     19  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   134    14
 LINE NO.=    88  KP1=    134  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     14  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   135    15
 LINE NO.=    89  KP1=    135  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     15  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   140    20
 LINE NO.=    90  KP1=    140  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     20  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS   141    21
 LINE NO.=    91  KP1=    141  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     21  TAN2=    0.0000   1.0000   0.0000
```

```
KEYPOINT    9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.360000      IN CSYS=  0

LINE CONNECTS KEYPOINTS    8001  9001
 LINE NO.=      9  KP1=    8001  TAN1=     0.0000    0.0000    1.0000
                   KP2=    9001  TAN2=     0.0000    0.0000   -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000
 Line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS     197   206
 LINE NO.=     10  KP1=     197  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     206  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     196   205
 LINE NO.=     11  KP1=     196  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     205  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     195   201
 LINE NO.=     12  KP1=     195  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     201  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     194   200
 LINE NO.=     13  KP1=     194  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     200  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     193   204
 LINE NO.=     14  KP1=     193  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     204  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     192   203
 LINE NO.=     15  KP1=     192  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     203  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     191   199
 LINE NO.=     16  KP1=     191  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     199  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     190   198
 LINE NO.=     17  KP1=     190  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     198  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     189   202
 LINE NO.=     18  KP1=     189  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     202  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     188   138
 LINE NO.=     19  KP1=     188  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     138  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     187   133
 LINE NO.=     20  KP1=     187  TAN1=    -1.0000    0.0000    0.0000
                   KP2=     133  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      68    13
 LINE NO.=     21  KP1=      68  TAN1=    -1.0000    0.0000    0.0000
                   KP2=      13  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      69    18
 LINE NO.=     22  KP1=      69  TAN1=    -1.0000    0.0000    0.0000
                   KP2=      18  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      70    85
 LINE NO.=     23  KP1=      70  TAN1=    -1.0000    0.0000    0.0000
                   KP2=      85  TAN2=     1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS      71    80
 LINE NO.=     24  KP1=      71  TAN1=    -1.0000    0.0000    0.0000
                   KP2=      80  TAN2=     1.0000    0.0000    0.0000
```

```
LINE CONNECTS KEYPOINTS    136    16
 LINE NO.=     92  KP1=    136  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     16  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=     93  KP1=    137  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     17  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=     94  KP1=    142  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     22  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=     95  KP1=    143  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     23  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=     96  KP1=     80  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     81  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=     97  KP1=     85  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     86  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=     98  KP1=     25  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     92  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=     99  KP1=     31  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     98  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=    100  KP1=     32  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     35  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=    101  KP1=     26  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     39  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=    102  KP1=     27  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     40  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=    103  KP1=     33  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     36  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=    104  KP1=     34  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     37  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=    105  KP1=     28  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     41  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=    106  KP1=     29  TAN1=   -0.0001   -1.0000    0.0000
                   KP2=     38  TAN2=    0.0001    1.0000    0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=    107  KP1=     82  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     83  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=    108  KP1=     87  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     88  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=    109  KP1=     93  TAN1=    0.0000   -1.0000    0.0000
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                KP2=     94  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     99   100
 LINE NO.=   110  KP1=     99  TAN1=    0.0000  -1.0000   0.0000
                KP2=    100  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=   111  KP1=    102  TAN1=    0.0000  -1.0000   0.0000
                KP2=    103  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=   112  KP1=    106  TAN1=    0.0000  -1.0000   0.0000
                KP2=    107  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=   113  KP1=     42  TAN1=   -0.0003  -1.0000   0.0000
                KP2=    109  TAN2=    0.0003   1.0000   0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=   114  KP1=    158  TAN1=    0.0001  -1.0000   0.0000
                KP2=    149  TAN2=   -0.0001   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=   115  KP1=    207  TAN1=    0.0000  -1.0000   0.0000
                KP2=    206  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=   116  KP1=    212  TAN1=    0.0000  -1.0000   0.0000
                KP2=    211  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=   117  KP1=    150  TAN1=    1.0000   0.0000   0.0000
                KP2=    149  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=   118  KP1=    144  TAN1=    1.0000   0.0000   0.0000
                KP2=    143  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=   119  KP1=     24  TAN1=    1.0000   0.0000   0.0000
                KP2=     23  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=   120  KP1=     30  TAN1=    1.0000   0.0000   0.0000
                KP2=     29  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=   121  KP1=     96  TAN1=    0.0000   1.0000   0.0000
                KP2=     95  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=   122  KP1=     90  TAN1=    0.0000   1.0000   0.0000
                KP2=     89  TAN2=    0.0000  -1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
 LINE NO.=   123  KP1=    197  TAN1=    0.0000  -1.0000   0.0000
                KP2=    196  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    206   205
 LINE NO.=   124  KP1=    206  TAN1=   -0.1483  -0.9889   0.0000
                KP2=    205  TAN2=    0.1483   0.9889   0.0000
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LINE CONNECTS KEYPOINTS    211   210
 LINE NO.=   125  KP1=     211  TAN1=    0.1483  -0.9889   0.0000
                  KP2=     210  TAN2=   -0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS    207   212
 LINE NO.=   126  KP1=     207  TAN1=   -0.9850  -0.1727   0.0000
                  KP2=     212  TAN2=    0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    206   211
 LINE NO.=   127  KP1=     206  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     211  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    205   210
 LINE NO.=   128  KP1=     205  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     210  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    218   220
 LINE NO.=   129  KP1=     218  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=     220  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    220   221
 LINE NO.=   130  KP1=     220  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=     221  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    193   192
 LINE NO.=   131  KP1=     193  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     192  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   203
 LINE NO.=   132  KP1=     204  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     203  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    209   208
 LINE NO.=   133  KP1=     209  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     208  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    204   209
 LINE NO.=   134  KP1=     204  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     209  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    203   208
 LINE NO.=   135  KP1=     203  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     208  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    219   159
 LINE NO.=   136  KP1=     219  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     159  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    162   160
 LINE NO.=   137  KP1=     162  TAN1=    0.2873  -0.9578   0.0000
                  KP2=     160  TAN2=   -0.2873   0.9578   0.0000

LINE CONNECTS KEYPOINTS    163   161
 LINE NO.=   138  KP1=     163  TAN1=   -0.5201  -0.8541   0.0000
                  KP2=     161  TAN2=    0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS    161   158
 LINE NO.=   139  KP1=     161  TAN1=   -0.5009  -0.8655   0.0000
                  KP2=     158  TAN2=    0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS    219   162
 LINE NO.=   140  KP1=     219  TAN1=   -0.9578   0.2873   0.0000
                  KP2=     162  TAN2=    0.9578  -0.2873   0.0000

LINE CONNECTS KEYPOINTS    159   160
 LINE NO.=   141  KP1=     159  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     160  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   188
 LINE NO.=   142  KP1=     189  TAN1=    0.0000  -1.0000   0.0000
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                  KP2=    188  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   138
 LINE NO.=   143  KP1=    202  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    138  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=    145  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    139  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=    202  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    145  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=    138  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    139  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=    146  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    140  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=    147  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    141  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=    146  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    147  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=    140  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    141  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=    148  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    142  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=    149  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    143  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=    148  TAN1=   -0.9889    0.1483    0.0000
                  KP2=    149  TAN2=    0.9889   -0.1483    0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=    142  TAN1=   -0.9889   -0.1483    0.0000
                  KP2=    143  TAN2=    0.9889    0.1483    0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=    150  TAN1=   -0.1727   -0.9850    0.0000
                  KP2=    144  TAN2=    0.1727    0.9850    0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=     69  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     70  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=     18  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     85  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     19    25
 LINE NO.=   158  KP1=     19  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     25  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=     18  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     19  TAN2=    1.0000    0.0000    0.0000
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LINE CONNECTS KEYPOINTS		85	25			
LINE NO.=	160	KP1=	85	TAN1=	-1.0000	0.0000	0.0000
		KP2=	25	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS		20	26			
LINE NO.=	161	KP1=	20	TAN1=	0.0000	-1.0000	0.0000
		KP2=	26	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		21	27			
LINE NO.=	162	KP1=	21	TAN1=	0.0000	-1.0000	0.0000
		KP2=	27	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		20	21			
LINE NO.=	163	KP1=	20	TAN1=	-1.0000	0.0000	0.0000
		KP2=	21	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS		26	27			
LINE NO.=	164	KP1=	26	TAN1=	-1.0000	0.0000	0.0000
		KP2=	27	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS		22	28			
LINE NO.=	165	KP1=	22	TAN1=	0.0000	-1.0000	0.0000
		KP2=	28	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		22	23			
LINE NO.=	166	KP1=	22	TAN1=	-0.9889	0.1483	0.0000
		KP2=	23	TAN2=	0.9889	-0.1483	0.0000
LINE CONNECTS KEYPOINTS		28	29			
LINE NO.=	167	KP1=	28	TAN1=	-0.9889	-0.1483	0.0000
		KP2=	29	TAN2=	0.9889	0.1483	0.0000
LINE CONNECTS KEYPOINTS		23	29			
LINE NO.=	168	KP1=	23	TAN1=	0.0000	-1.0000	0.0000
		KP2=	29	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		24	30			
LINE NO.=	169	KP1=	24	TAN1=	0.1727	-0.9850	0.0000
		KP2=	30	TAN2=	-0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		73	74			
LINE NO.=	170	KP1=	73	TAN1=	0.0000	-1.0000	0.0000
		KP2=	74	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		86	87			
LINE NO.=	171	KP1=	86	TAN1=	0.0000	-1.0000	0.0000
		KP2=	87	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		92	93			
LINE NO.=	172	KP1=	92	TAN1=	0.0000	-1.0000	0.0000
		KP2=	93	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		86	92			
LINE NO.=	173	KP1=	86	TAN1=	-1.0000	0.0000	0.0000
		KP2=	92	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS		87	93			
LINE NO.=	174	KP1=	87	TAN1=	-1.0000	0.0000	0.0000
		KP2=	93	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS		39	106			
LINE NO.=	175	KP1=	39	TAN1=	0.0000	-1.0000	0.0000
		KP2=	106	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		40	42			
LINE NO.=	176	KP1=	40	TAN1=	-0.2873	-0.9578	0.0000
		KP2=	42	TAN2=	0.2873	0.9578	0.0000
LINE CONNECTS KEYPOINTS		39	40			
LINE NO.=	177	KP1=	39	TAN1=	-1.0000	0.0000	0.0000

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                  KP2=     40  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=   178  KP1=    106  TAN1=   -0.9578  -0.2873   0.0000
                  KP2=     42  TAN2=    0.9578   0.2873   0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=   179  KP1=     38  TAN1=    0.5009  -0.8655   0.0000
                  KP2=     41  TAN2=   -0.5009   0.8655   0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=   180  KP1=     41  TAN1=    0.5201  -0.8541   0.0000
                  KP2=     43  TAN2=   -0.5201   0.8541   0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=   181  KP1=     77  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     78  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=   182  KP1=     88  TAN1=    0.1483  -0.9889   0.0000
                  KP2=     89  TAN2=   -0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=   183  KP1=     94  TAN1=   -0.1483  -0.9889   0.0000
                  KP2=     95  TAN2=    0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=   184  KP1=     88  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     94  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=   185  KP1=     89  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     95  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=   186  KP1=     90  TAN1=   -0.9850   0.1727   0.0000
                  KP2=     96  TAN2=    0.9850  -0.1727   0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=   187  KP1=    109  TAN1=    0.8541  -0.5201   0.0000
                  KP2=    107  TAN2=   -0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=   188  KP1=    107  TAN1=    0.8655  -0.5009   0.0000
                  KP2=    104  TAN2=   -0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=   189  KP1=    224  TAN1=   -0.9850  -0.1727   0.0000
                  KP2=    225  TAN2=    0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=   190  KP1=    230  TAN1=   -0.9850  -0.1727   0.0000
                  KP2=    231  TAN2=    0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=   191  KP1=    236  TAN1=   -0.9850  -0.1727   0.0000
                  KP2=    237  TAN2=    0.9850   0.1727   0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=   192  KP1=    226  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=    227  TAN2=    0.8655   0.5009   0.0000

LINE CONNECTS KEYPOINTS    227   228
 LINE NO.=   193  KP1=    227  TAN1=   -0.8541  -0.5201   0.0000
                  KP2=    228  TAN2=    0.8541   0.5201   0.0000

LINE CONNECTS KEYPOINTS    232   233
 LINE NO.=   194  KP1=    232  TAN1=   -0.8655  -0.5009   0.0000
                  KP2=    233  TAN2=    0.8655   0.5009   0.0000
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LINE CONNECTS KEYPOINTS		233	234			
LINE NO.=	195	KP1=	233	TAN1=	-0.8541	-0.5201	0.0000
		KP2=	234	TAN2=	0.8541	0.5201	0.0000
LINE CONNECTS KEYPOINTS		238	239			
LINE NO.=	196	KP1=	238	TAN1=	-0.8655	-0.5009	0.0000
		KP2=	239	TAN2=	0.8655	0.5009	0.0000
LINE CONNECTS KEYPOINTS		239	240			
LINE NO.=	197	KP1=	239	TAN1=	-0.8541	-0.5201	0.0000
		KP2=	240	TAN2=	0.8541	0.5201	0.0000
LINE CONNECTS KEYPOINTS		171	170			
LINE NO.=	198	KP1=	171	TAN1=	-0.5201	-0.8541	0.0000
		KP2=	170	TAN2=	0.5201	0.8541	0.0000
LINE CONNECTS KEYPOINTS		170	169			
LINE NO.=	199	KP1=	170	TAN1=	-0.5009	-0.8655	0.0000
		KP2=	169	TAN2=	0.5009	0.8655	0.0000
LINE CONNECTS KEYPOINTS		178	177			
LINE NO.=	200	KP1=	178	TAN1=	-0.5201	-0.8541	0.0000
		KP2=	177	TAN2=	0.5201	0.8541	0.0000
LINE CONNECTS KEYPOINTS		177	176			
LINE NO.=	201	KP1=	177	TAN1=	-0.5009	-0.8655	0.0000
		KP2=	176	TAN2=	0.5009	0.8655	0.0000
LINE CONNECTS KEYPOINTS		185	184			
LINE NO.=	202	KP1=	185	TAN1=	-0.5201	-0.8541	0.0000
		KP2=	184	TAN2=	0.5201	0.8541	0.0000
LINE CONNECTS KEYPOINTS		184	183			
LINE NO.=	203	KP1=	184	TAN1=	-0.5009	-0.8655	0.0000
		KP2=	183	TAN2=	0.5009	0.8655	0.0000
LINE CONNECTS KEYPOINTS		168	167			
LINE NO.=	204	KP1=	168	TAN1=	-0.1727	-0.9850	0.0000
		KP2=	167	TAN2=	0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		175	174			
LINE NO.=	205	KP1=	175	TAN1=	-0.1727	-0.9850	0.0000
		KP2=	174	TAN2=	0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		182	181			
LINE NO.=	206	KP1=	182	TAN1=	-0.1727	-0.9850	0.0000
		KP2=	181	TAN2=	0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		47	48			
LINE NO.=	207	KP1=	47	TAN1=	0.1727	-0.9850	0.0000
		KP2=	48	TAN2=	-0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		54	55			
LINE NO.=	208	KP1=	54	TAN1=	0.1727	-0.9850	0.0000
		KP2=	55	TAN2=	-0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		61	62			
LINE NO.=	209	KP1=	61	TAN1=	0.1727	-0.9850	0.0000
		KP2=	62	TAN2=	-0.1727	0.9850	0.0000
LINE CONNECTS KEYPOINTS		49	50			
LINE NO.=	210	KP1=	49	TAN1=	0.5009	-0.8655	0.0000
		KP2=	50	TAN2=	-0.5009	0.8655	0.0000
LINE CONNECTS KEYPOINTS		50	51			
LINE NO.=	211	KP1=	50	TAN1=	0.5201	-0.8541	0.0000
		KP2=	51	TAN2=	-0.5201	0.8541	0.0000
LINE CONNECTS KEYPOINTS		56	57			
LINE NO.=	212	KP1=	56	TAN1=	0.5009	-0.8655	0.0000

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                    KP2=     57  TAN2=   -0.5009   0.8655   0.0000

 LINE CONNECTS KEYPOINTS     57    58
  LINE NO.=   213  KP1=      57  TAN1=    0.5201  -0.8541   0.0000
                   KP2=      58  TAN2=   -0.5201   0.8541   0.0000

 LINE CONNECTS KEYPOINTS     63    64
  LINE NO.=   214  KP1=      63  TAN1=    0.5009  -0.8655   0.0000
                   KP2=      64  TAN2=   -0.5009   0.8655   0.0000

 LINE CONNECTS KEYPOINTS     64    65
  LINE NO.=   215  KP1=      64  TAN1=    0.5201  -0.8541   0.0000
                   KP2=      65  TAN2=   -0.5201   0.8541   0.0000

 LINE CONNECTS KEYPOINTS    117   116
  LINE NO.=   216  KP1=     117  TAN1=    0.8541  -0.5201   0.0000
                   KP2=     116  TAN2=   -0.8541   0.5201   0.0000

 LINE CONNECTS KEYPOINTS    116   115
  LINE NO.=   217  KP1=     116  TAN1=    0.8655  -0.5009   0.0000
                   KP2=     115  TAN2=   -0.8655   0.5009   0.0000

 LINE CONNECTS KEYPOINTS    124   123
  LINE NO.=   218  KP1=     124  TAN1=    0.8541  -0.5201   0.0000
                   KP2=     123  TAN2=   -0.8541   0.5201   0.0000

 LINE CONNECTS KEYPOINTS    123   122
  LINE NO.=   219  KP1=     123  TAN1=    0.8655  -0.5009   0.0000
                   KP2=     122  TAN2=   -0.8655   0.5009   0.0000

 LINE CONNECTS KEYPOINTS    131   130
  LINE NO.=   220  KP1=     131  TAN1=    0.8541  -0.5201   0.0000
                   KP2=     130  TAN2=   -0.8541   0.5201   0.0000

 LINE CONNECTS KEYPOINTS    130   129
  LINE NO.=   221  KP1=     130  TAN1=    0.8655  -0.5009   0.0000
                   KP2=     129  TAN2=   -0.8655   0.5009   0.0000

 LINE CONNECTS KEYPOINTS    114   113
  LINE NO.=   222  KP1=     114  TAN1=    0.9850  -0.1727   0.0000
                   KP2=     113  TAN2=   -0.9850   0.1727   0.0000

 LINE CONNECTS KEYPOINTS    121   120
  LINE NO.=   223  KP1=     121  TAN1=    0.9850  -0.1727   0.0000
                   KP2=     120  TAN2=   -0.9850   0.1727   0.0000

 LINE CONNECTS KEYPOINTS    128   127
  LINE NO.=   224  KP1=     128  TAN1=    0.9850  -0.1727   0.0000
                   KP2=     127  TAN2=   -0.9850   0.1727   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =     1,  SPACING RATIO =    1.000
  line set 7 tube thickness

 LINE CONNECTS KEYPOINTS    196   195
  LINE NO.=   225  KP1=     196  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     195  TAN2=    0.0000   1.0000   0.0000

 LINE CONNECTS KEYPOINTS    205   201
  LINE NO.=   226  KP1=     205  TAN1=    0.7071  -0.7071   0.0000
                   KP2=     201  TAN2=   -0.7071   0.7071   0.0000

 LINE CONNECTS KEYPOINTS    204   200
  LINE NO.=   227  KP1=     204  TAN1=    0.7071   0.7071   0.0000
                   KP2=     200  TAN2=   -0.7071  -0.7071   0.0000

 LINE CONNECTS KEYPOINTS    193   194
  LINE NO.=   228  KP1=     193  TAN1=    0.0000   1.0000   0.0000
                   KP2=     194  TAN2=    0.0000  -1.0000   0.0000
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LINE CONNECTS KEYPOINTS		210	215			
LINE NO.=	229	KP1=	210	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	215	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		220	217			
LINE NO.=	230	KP1=	220	TAN1=	0.7071	-0.7071	0.0000
		KP2=	217	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		219	216			
LINE NO.=	231	KP1=	219	TAN1=	0.7071	0.7071	0.0000
		KP2=	216	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		209	214			
LINE NO.=	232	KP1=	209	TAN1=	-0.7071	0.7071	0.0000
		KP2=	214	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		192	191			
LINE NO.=	233	KP1=	192	TAN1=	0.0000	-1.0000	0.0000
		KP2=	191	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		203	199			
LINE NO.=	234	KP1=	203	TAN1=	0.7071	-0.7071	0.0000
		KP2=	199	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		202	198			
LINE NO.=	235	KP1=	202	TAN1=	0.7071	0.7071	0.0000
		KP2=	198	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		189	190			
LINE NO.=	236	KP1=	189	TAN1=	0.0000	1.0000	0.0000
		KP2=	190	TAN2=	0.0000	-1.0000	0.0000
LINE CONNECTS KEYPOINTS		208	213			
LINE NO.=	237	KP1=	208	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	213	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		159	155			
LINE NO.=	238	KP1=	159	TAN1=	0.7071	-0.7071	0.0000
		KP2=	155	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		146	152			
LINE NO.=	239	KP1=	146	TAN1=	0.7071	0.7071	0.0000
		KP2=	152	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		145	151			
LINE NO.=	240	KP1=	145	TAN1=	-0.7071	0.7071	0.0000
		KP2=	151	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		160	156			
LINE NO.=	241	KP1=	160	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	156	TAN2=	0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		161	157			
LINE NO.=	242	KP1=	161	TAN1=	0.7071	-0.7071	0.0000
		KP2=	157	TAN2=	-0.7071	0.7071	0.0000
LINE CONNECTS KEYPOINTS		148	154			
LINE NO.=	243	KP1=	148	TAN1=	0.7071	0.7071	0.0000
		KP2=	154	TAN2=	-0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		147	153			
LINE NO.=	244	KP1=	147	TAN1=	-0.7071	0.7071	0.0000
		KP2=	153	TAN2=	0.7071	-0.7071	0.0000
LINE CONNECTS KEYPOINTS		188	187			
LINE NO.=	245	KP1=	188	TAN1=	0.0000	-1.0000	0.0000
		KP2=	187	TAN2=	0.0000	1.0000	0.0000
LINE CONNECTS KEYPOINTS		138	133			
LINE NO.=	246	KP1=	138	TAN1=	0.7071	-0.7071	0.0000

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                    KP2=    133  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      18    13
 LINE NO.=   247  KP1=      18  TAN1=    0.7071   0.7071   0.0000
                  KP2=      13  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS      69    68
 LINE NO.=   248  KP1=      69  TAN1=    0.0000   1.0000   0.0000
                  KP2=      68  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     139   134
 LINE NO.=   249  KP1=     139  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     134  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     140   135
 LINE NO.=   250  KP1=     140  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     135  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      20    15
 LINE NO.=   251  KP1=      20  TAN1=    0.7071   0.7071   0.0000
                  KP2=      15  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS      19    14
 LINE NO.=   252  KP1=      19  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      14  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     141   136
 LINE NO.=   253  KP1=     141  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     136  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     142   137
 LINE NO.=   254  KP1=     142  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     137  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      22    17
 LINE NO.=   255  KP1=      22  TAN1=    0.7071   0.7071   0.0000
                  KP2=      17  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS      21    16
 LINE NO.=   256  KP1=      21  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      16  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS      70    71
 LINE NO.=   257  KP1=      70  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      71  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS      85    80
 LINE NO.=   258  KP1=      85  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      80  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      86    81
 LINE NO.=   259  KP1=      86  TAN1=    0.7071   0.7071   0.0000
                  KP2=      81  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS      73    72
 LINE NO.=   260  KP1=      73  TAN1=    0.0000   1.0000   0.0000
                  KP2=      72  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS      25    31
 LINE NO.=   261  KP1=      25  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      31  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      26    32
 LINE NO.=   262  KP1=      26  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      32  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS      39    35
 LINE NO.=   263  KP1=      39  TAN1=    0.7071   0.7071   0.0000
                  KP2=      35  TAN2=   -0.7071  -0.7071   0.0000
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LINE CONNECTS KEYPOINTS     92    98
 LINE NO.=    264  KP1=     92  TAN1=   -0.7071   0.7071   0.0000
                   KP2=     98  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=    265  KP1=     27  TAN1=   -0.7071  -0.7071   0.0000
                   KP2=     33  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=    266  KP1=     28  TAN1=    0.7071  -0.7071   0.0000
                   KP2=     34  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=    267  KP1=     41  TAN1=    0.7071   0.7071   0.0000
                   KP2=     37  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=    268  KP1=     40  TAN1=   -0.7071   0.7071   0.0000
                   KP2=     36  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=    269  KP1=     74  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     75  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=    270  KP1=     87  TAN1=    0.7071  -0.7071   0.0000
                   KP2=     82  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=    271  KP1=     88  TAN1=    0.7071   0.7071   0.0000
                   KP2=     83  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=    272  KP1=     77  TAN1=    0.0000   1.0000   0.0000
                   KP2=     76  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=    273  KP1=     93  TAN1=   -0.7071  -0.7071   0.0000
                   KP2=     99  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=    274  KP1=    106  TAN1=    0.7071  -0.7071   0.0000
                   KP2=    102  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=    275  KP1=    107  TAN1=    0.7071   0.7071   0.0000
                   KP2=    103  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=    276  KP1=     94  TAN1=   -0.7071   0.7071   0.0000
                   KP2=    100  TAN2=    0.7071  -0.7071   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=    277  KP1=    222  TAN1=   -1.0000   0.0000   0.0000
                   KP2=    207  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS    223   224
 LINE NO.=    278  KP1=    223  TAN1=   -1.0000   0.0000   0.0000
                   KP2=    224  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=    279  KP1=    229  TAN1=   -1.0000   0.0000   0.0000
                   KP2=    230  TAN2=    0.9862   0.1656   0.0000
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LINE CONNECTS KEYPOINTS    235   236
 LINE NO.=   280 KP1=     235  TAN1=   -1.0000   0.0000   0.0000
                 KP2=     236  TAN2=    0.9862   0.1656   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281 KP1=     212  TAN1=   -0.9837  -0.1797   0.0000
                 KP2=     218  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282 KP1=     225  TAN1=   -0.9837  -0.1797   0.0000
                 KP2=     226  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283 KP1=     231  TAN1=   -0.9837  -0.1797   0.0000
                 KP2=     232  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284 KP1=     237  TAN1=   -0.9837  -0.1797   0.0000
                 KP2=     238  TAN2=    0.8725   0.4887   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285 KP1=     221  TAN1=   -0.8497  -0.5272   0.0000
                 KP2=     163  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286 KP1=     228  TAN1=   -0.8497  -0.5272   0.0000
                 KP2=     171  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287 KP1=     234  TAN1=   -0.8497  -0.5272   0.0000
                 KP2=     178  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288 KP1=     240  TAN1=   -0.8497  -0.5272   0.0000
                 KP2=     185  TAN2=    0.5272   0.8497   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289 KP1=     158  TAN1=   -0.4887  -0.8725   0.0000
                 KP2=     150  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290 KP1=     169  TAN1=   -0.4887  -0.8725   0.0000
                 KP2=     168  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291 KP1=     176  TAN1=   -0.4887  -0.8725   0.0000
                 KP2=     175  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292 KP1=     183  TAN1=   -0.4887  -0.8725   0.0000
                 KP2=     182  TAN2=    0.1797   0.9837   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293 KP1=     144  TAN1=   -0.1656  -0.9862   0.0000
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                  KP2=     24  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    167    47
 LINE NO.=   294  KP1=     167  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=      47  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=     174  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=      54  TAN2=   -0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=     181  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=      61  TAN2=   -0.1656   0.9862   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=      30  TAN1=    0.1797  -0.9837   0.0000
                  KP2=      38  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=      48  TAN1=    0.1797  -0.9837   0.0000
                  KP2=      49  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=      55  TAN1=    0.1797  -0.9837   0.0000
                  KP2=      56  TAN2=   -0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=      62  TAN1=    0.1797  -0.9837   0.0000
                  KP2=      63  TAN2=   -0.4887   0.8725   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=      43  TAN1=    0.5272  -0.8497   0.0000
                  KP2=     109  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=      51  TAN1=    0.5272  -0.8497   0.0000
                  KP2=     117  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=      58  TAN1=    0.5272  -0.8497   0.0000
                  KP2=     124  TAN2=   -0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=      65  TAN1=    0.5272  -0.8497   0.0000
                  KP2=     131  TAN2=   -0.8497   0.5272   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=     104  TAN1=    0.8725  -0.4887   0.0000
                  KP2=      96  TAN2=   -0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS    115   114
 LINE NO.=   306  KP1=     115  TAN1=    0.8725  -0.4887   0.0000
                  KP2=     114  TAN2=   -0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307  KP1=     122  TAN1=    0.8725  -0.4887   0.0000
                  KP2=     121  TAN2=   -0.9837   0.1797   0.0000
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LINE CONNECTS KEYPOINTS    129   128
 LINE NO.=   308  KP1=     129  TAN1=    0.8725  -0.4887   0.0000
                  KP2=     128  TAN2=   -0.9837   0.1797   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309  KP1=      90  TAN1=    0.9862  -0.1656   0.0000
                  KP2=     110  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310  KP1=     113  TAN1=    0.9862  -0.1656   0.0000
                  KP2=     112  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311  KP1=     120  TAN1=    0.9862  -0.1656   0.0000
                  KP2=     119  TAN2=   -1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312  KP1=     127  TAN1=    0.9862  -0.1656   0.0000
                  KP2=     126  TAN2=   -1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313  KP1=     222  TAN1=    0.0000   1.0000   0.0000
                  KP2=     223  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314  KP1=     207  TAN1=   -0.1656   0.9862   0.0000
                  KP2=     224  TAN2=    0.1656  -0.9862   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315  KP1=     212  TAN1=   -0.1797   0.9837   0.0000
                  KP2=     225  TAN2=    0.1797  -0.9837   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316  KP1=     218  TAN1=   -0.4887   0.8725   0.0000
                  KP2=     226  TAN2=    0.4887  -0.8725   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317  KP1=     220  TAN1=   -0.5130   0.8584   0.0000
                  KP2=     227  TAN2=    0.5130  -0.8584   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318  KP1=     221  TAN1=   -0.5272   0.8497   0.0000
                  KP2=     228  TAN2=    0.5272  -0.8497   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319  KP1=     163  TAN1=   -0.8497   0.5272   0.0000
                  KP2=     171  TAN2=    0.8497  -0.5272   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320  KP1=     161  TAN1=   -0.8584   0.5130   0.0000
                  KP2=     170  TAN2=    0.8584  -0.5130   0.0000

LINE CONNECTS KEYPOINTS    158   169
 LINE NO.=   321  KP1=     158  TAN1=   -0.8725   0.4887   0.0000
                  KP2=     169  TAN2=    0.8725  -0.4887   0.0000

LINE CONNECTS KEYPOINTS    150   168
 LINE NO.=   322  KP1=     150  TAN1=   -0.9837   0.1797   0.0000
                  KP2=     168  TAN2=    0.9837  -0.1797   0.0000
```

```
LINE CONNECTS KEYPOINTS    144   167
 LINE NO.=   323  KP1=     144  TAN1=   -0.9862   0.1656   0.0000
                  KP2=     167  TAN2=    0.9862  -0.1656   0.0000

LINE CONNECTS KEYPOINTS     24    47
 LINE NO.=   324  KP1=      24  TAN1=   -0.9862  -0.1656   0.0000
                  KP2=      47  TAN2=    0.9862   0.1656   0.0000

LINE CONNECTS KEYPOINTS     30    48
 LINE NO.=   325  KP1=      30  TAN1=   -0.9837  -0.1797   0.0000
                  KP2=      48  TAN2=    0.9837   0.1797   0.0000

LINE CONNECTS KEYPOINTS     38    49
 LINE NO.=   326  KP1=      38  TAN1=   -0.8725  -0.4887   0.0000
                  KP2=      49  TAN2=    0.8725   0.4887   0.0000

LINE CONNECTS KEYPOINTS     41    50
 LINE NO.=   327  KP1=      41  TAN1=   -0.8584  -0.5130   0.0000
                  KP2=      50  TAN2=    0.8584   0.5130   0.0000

LINE CONNECTS KEYPOINTS     43    51
 LINE NO.=   328  KP1=      43  TAN1=   -0.8497  -0.5272   0.0000
                  KP2=      51  TAN2=    0.8497   0.5272   0.0000

LINE CONNECTS KEYPOINTS    109   117
 LINE NO.=   329  KP1=     109  TAN1=   -0.5272  -0.8497   0.0000
                  KP2=     117  TAN2=    0.5272   0.8497   0.0000

LINE CONNECTS KEYPOINTS    107   116
 LINE NO.=   330  KP1=     107  TAN1=   -0.5130  -0.8584   0.0000
                  KP2=     116  TAN2=    0.5130   0.8584   0.0000

LINE CONNECTS KEYPOINTS    104   115
 LINE NO.=   331  KP1=     104  TAN1=   -0.4887  -0.8725   0.0000
                  KP2=     115  TAN2=    0.4887   0.8725   0.0000

LINE CONNECTS KEYPOINTS     96   114
 LINE NO.=   332  KP1=      96  TAN1=   -0.1797  -0.9837   0.0000
                  KP2=     114  TAN2=    0.1797   0.9837   0.0000

LINE CONNECTS KEYPOINTS     90   113
 LINE NO.=   333  KP1=      90  TAN1=   -0.1656  -0.9862   0.0000
                  KP2=     113  TAN2=    0.1656   0.9862   0.0000

LINE CONNECTS KEYPOINTS    110   112
 LINE NO.=   334  KP1=     110  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     112  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 18 OB inner thickness

LINE CONNECTS KEYPOINTS    223   229
 LINE NO.=   335  KP1=     223  TAN1=    0.0000   1.0000   0.0000
                  KP2=     229  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    224   230
 LINE NO.=   336  KP1=     224  TAN1=   -0.1656   0.9862   0.0000
                  KP2=     230  TAN2=    0.1656  -0.9862   0.0000

LINE CONNECTS KEYPOINTS    225   231
 LINE NO.=   337  KP1=     225  TAN1=   -0.1797   0.9837   0.0000
                  KP2=     231  TAN2=    0.1797  -0.9837   0.0000

LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=   338  KP1=     226  TAN1=   -0.4887   0.8725   0.0000
                  KP2=     232  TAN2=    0.4887  -0.8725   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=   339  KP1=     227  TAN1=   -0.5130   0.8584   0.0000
```

		KP2=	233	TAN2=	0.5130	-0.8584	0.0000
LINE CONNECTS KEYPOINTS			228	234			
LINE NO.=	340	KP1=	228	TAN1=	-0.5272	0.8497	0.0000
		KP2=	234	TAN2=	0.5272	-0.8497	0.0000
LINE CONNECTS KEYPOINTS			171	178			
LINE NO.=	341	KP1=	171	TAN1=	-0.8497	0.5272	0.0000
		KP2=	178	TAN2=	0.8497	-0.5272	0.0000
LINE CONNECTS KEYPOINTS			170	177			
LINE NO.=	342	KP1=	170	TAN1=	-0.8584	0.5130	0.0000
		KP2=	177	TAN2=	0.8584	-0.5130	0.0000
LINE CONNECTS KEYPOINTS			169	176			
LINE NO.=	343	KP1=	169	TAN1=	-0.8725	0.4887	0.0000
		KP2=	176	TAN2=	0.8725	-0.4887	0.0000
LINE CONNECTS KEYPOINTS			168	175			
LINE NO.=	344	KP1=	168	TAN1=	-0.9837	0.1797	0.0000
		KP2=	175	TAN2=	0.9837	-0.1797	0.0000
LINE CONNECTS KEYPOINTS			167	174			
LINE NO.=	345	KP1=	167	TAN1=	-0.9862	0.1656	0.0000
		KP2=	174	TAN2=	0.9862	-0.1656	0.0000
LINE CONNECTS KEYPOINTS			47	54			
LINE NO.=	346	KP1=	47	TAN1=	-0.9862	-0.1656	0.0000
		KP2=	54	TAN2=	0.9862	0.1656	0.0000
LINE CONNECTS KEYPOINTS			48	55			
LINE NO.=	347	KP1=	48	TAN1=	-0.9837	-0.1797	0.0000
		KP2=	55	TAN2=	0.9837	0.1797	0.0000
LINE CONNECTS KEYPOINTS			49	56			
LINE NO.=	348	KP1=	49	TAN1=	-0.8725	-0.4887	0.0000
		KP2=	56	TAN2=	0.8725	0.4887	0.0000
LINE CONNECTS KEYPOINTS			50	57			
LINE NO.=	349	KP1=	50	TAN1=	-0.8584	-0.5130	0.0000
		KP2=	57	TAN2=	0.8584	0.5130	0.0000
LINE CONNECTS KEYPOINTS			51	58			
LINE NO.=	350	KP1=	51	TAN1=	-0.8497	-0.5272	0.0000
		KP2=	58	TAN2=	0.8497	0.5272	0.0000
LINE CONNECTS KEYPOINTS			117	124			
LINE NO.=	351	KP1=	117	TAN1=	-0.5272	-0.8497	0.0000
		KP2=	124	TAN2=	0.5272	0.8497	0.0000
LINE CONNECTS KEYPOINTS			116	123			
LINE NO.=	352	KP1=	116	TAN1=	-0.5130	-0.8584	0.0000
		KP2=	123	TAN2=	0.5130	0.8584	0.0000
LINE CONNECTS KEYPOINTS			115	122			
LINE NO.=	353	KP1=	115	TAN1=	-0.4887	-0.8725	0.0000
		KP2=	122	TAN2=	0.4887	0.8725	0.0000
LINE CONNECTS KEYPOINTS			114	121			
LINE NO.=	354	KP1=	114	TAN1=	-0.1797	-0.9837	0.0000
		KP2=	121	TAN2=	0.1797	0.9837	0.0000
LINE CONNECTS KEYPOINTS			113	120			
LINE NO.=	355	KP1=	113	TAN1=	-0.1656	-0.9862	0.0000
		KP2=	120	TAN2=	0.1656	0.9862	0.0000
LINE CONNECTS KEYPOINTS			112	119			
LINE NO.=	356	KP1=	112	TAN1=	0.0000	-1.0000	0.0000
		KP2=	119	TAN2=	0.0000	1.0000	0.0000

```
SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000
 line set 19 skirt thickness

LINE CONNECTS KEYPOINTS    229   235
 LINE NO.=   357  KP1=    229  TAN1=    0.0000    1.0000    0.0000
                  KP2=    235  TAN2=    0.0000   -1.0000    0.0000

LINE CONNECTS KEYPOINTS    230   236
 LINE NO.=   358  KP1=    230  TAN1=   -0.1656    0.9862    0.0000
                  KP2=    236  TAN2=    0.1656   -0.9862    0.0000

LINE CONNECTS KEYPOINTS    231   237
 LINE NO.=   359  KP1=    231  TAN1=   -0.1797    0.9837    0.0000
                  KP2=    237  TAN2=    0.1797   -0.9837    0.0000

LINE CONNECTS KEYPOINTS    232   238
 LINE NO.=   360  KP1=    232  TAN1=   -0.4887    0.8725    0.0000
                  KP2=    238  TAN2=    0.4887   -0.8725    0.0000

LINE CONNECTS KEYPOINTS    233   239
 LINE NO.=   361  KP1=    233  TAN1=   -0.5130    0.8584    0.0000
                  KP2=    239  TAN2=    0.5130   -0.8584    0.0000

LINE CONNECTS KEYPOINTS    234   240
 LINE NO.=   362  KP1=    234  TAN1=   -0.5272    0.8497    0.0000
                  KP2=    240  TAN2=    0.5272   -0.8497    0.0000

LINE CONNECTS KEYPOINTS    178   185
 LINE NO.=   363  KP1=    178  TAN1=   -0.8497    0.5272    0.0000
                  KP2=    185  TAN2=    0.8497   -0.5272    0.0000

LINE CONNECTS KEYPOINTS    177   184
 LINE NO.=   364  KP1=    177  TAN1=   -0.8584    0.5130    0.0000
                  KP2=    184  TAN2=    0.8584   -0.5130    0.0000

LINE CONNECTS KEYPOINTS    176   183
 LINE NO.=   365  KP1=    176  TAN1=   -0.8725    0.4887    0.0000
                  KP2=    183  TAN2=    0.8725   -0.4887    0.0000

LINE CONNECTS KEYPOINTS    175   182
 LINE NO.=   366  KP1=    175  TAN1=   -0.9837    0.1797    0.0000
                  KP2=    182  TAN2=    0.9837   -0.1797    0.0000

LINE CONNECTS KEYPOINTS    174   181
 LINE NO.=   367  KP1=    174  TAN1=   -0.9862    0.1656    0.0000
                  KP2=    181  TAN2=    0.9862   -0.1656    0.0000

LINE CONNECTS KEYPOINTS     54    61
 LINE NO.=   368  KP1=     54  TAN1=   -0.9862   -0.1656    0.0000
                  KP2=     61  TAN2=    0.9862    0.1656    0.0000

LINE CONNECTS KEYPOINTS     55    62
 LINE NO.=   369  KP1=     55  TAN1=   -0.9837   -0.1797    0.0000
                  KP2=     62  TAN2=    0.9837    0.1797    0.0000

LINE CONNECTS KEYPOINTS     56    63
 LINE NO.=   370  KP1=     56  TAN1=   -0.8725   -0.4887    0.0000
                  KP2=     63  TAN2=    0.8725    0.4887    0.0000

LINE CONNECTS KEYPOINTS     57    64
 LINE NO.=   371  KP1=     57  TAN1=   -0.8584   -0.5130    0.0000
                  KP2=     64  TAN2=    0.8584    0.5130    0.0000

LINE CONNECTS KEYPOINTS     58    65
 LINE NO.=   372  KP1=     58  TAN1=   -0.8497   -0.5272    0.0000
                  KP2=     65  TAN2=    0.8497    0.5272    0.0000

LINE CONNECTS KEYPOINTS    124   131
 LINE NO.=   373  KP1=    124  TAN1=   -0.5272   -0.8497    0.0000
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                  KP2=    131  TAN2=    0.5272   0.8497   0.0000

 LINE CONNECTS KEYPOINTS    123   130
  LINE NO.=   374  KP1=    123  TAN1=   -0.5130  -0.8584   0.0000
                   KP2=    130  TAN2=    0.5130   0.8584   0.0000

 LINE CONNECTS KEYPOINTS    122   129
  LINE NO.=   375  KP1=    122  TAN1=   -0.4887  -0.8725   0.0000
                   KP2=    129  TAN2=    0.4887   0.8725   0.0000

 LINE CONNECTS KEYPOINTS    121   128
  LINE NO.=   376  KP1=    121  TAN1=   -0.1797  -0.9837   0.0000
                   KP2=    128  TAN2=    0.1797   0.9837   0.0000

 LINE CONNECTS KEYPOINTS    120   127
  LINE NO.=   377  KP1=    120  TAN1=   -0.1656  -0.9862   0.0000
                   KP2=    127  TAN2=    0.1656   0.9862   0.0000

 LINE CONNECTS KEYPOINTS    119   126
  LINE NO.=   378  KP1=    119  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    126  TAN2=    0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
      TO  NDIV =    2,  SPACING RATIO =   1.000
  area set 1, tubes

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    195   196   205   201

     AREA NUMBER =      1

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    200   201   205   204

     AREA NUMBER =      2

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    193   194   200   204

     AREA NUMBER =      3

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    191   192   203   199

     AREA NUMBER =      4

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    198   199   203   202

     AREA NUMBER =      5

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    189   190   198   202

     AREA NUMBER =      6

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    187   188   138   133

     AREA NUMBER =      7

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    133   138    18    13

     AREA NUMBER =      8

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     69    68    13    18

     AREA NUMBER =      9
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     71    70    85    80

    AREA NUMBER =     10

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     80    85    86    81

    AREA NUMBER =     11

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     73    72    81    86

    AREA NUMBER =     12

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     75    74    87    82

    AREA NUMBER =     13

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     82    87    88    83

    AREA NUMBER =     14

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     77    76    83    88

    AREA NUMBER =     15

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   210   215   214

    AREA NUMBER =     16

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    215   210   220   217

    AREA NUMBER =     17

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    216   217   220   219

    AREA NUMBER =     18

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   214   216   219

    AREA NUMBER =     19

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   208   213   151

    AREA NUMBER =     20

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    213   208   159   155

    AREA NUMBER =     21

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    152   155   159   146

    AREA NUMBER =     22

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   151   152   146

    AREA NUMBER =     23
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    134   139   140   135

    AREA NUMBER =     24

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    135   140    20    15

    AREA NUMBER =     25

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19    14    15    20

    AREA NUMBER =     26

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19   139   134    14

    AREA NUMBER =     27

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    25    31    98

    AREA NUMBER =     28

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31    25    26    32

    AREA NUMBER =     29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32    26    39    35

    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    98    35    39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    93    99   100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99    93   106   102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102   106   107   103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94   100   103   107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156   160   161   157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157   161   148   154

    AREA NUMBER =     37
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   153   154   148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   160   156   153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136   141   142   137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137   142    22    17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    16    17    22

    AREA NUMBER =     42

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34

    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159
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     AREA NUMBER =     51

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    202   203   208   145

     AREA NUMBER =     52

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    146   159   160   147

     AREA NUMBER =     53

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    188   189   202   138

     AREA NUMBER =     54

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    138   202   145   139

     AREA NUMBER =     55

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    139   145   146   140

     AREA NUMBER =     56

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    140   146   147   141

     AREA NUMBER =     57

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    141   147   148   142

     AREA NUMBER =     58

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     18   138   139    19

     AREA NUMBER =     59

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     20   140   141    21

     AREA NUMBER =     60

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     70    69    18    85

     AREA NUMBER =     61

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     85    18    19    25

     AREA NUMBER =     62

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     25    19    20    26

     AREA NUMBER =     63

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     26    20    21    27

     AREA NUMBER =     64

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     27    21    22    28
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    AREA NUMBER =     65

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     86    85    25    92

    AREA NUMBER =     66

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     39    26    27    40

    AREA NUMBER =     67

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     74    73    86    87

    AREA NUMBER =     68

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     87    86    92    93

    AREA NUMBER =     69

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     93    92    39   106

    AREA NUMBER =     70

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     88    87    93    94

    AREA NUMBER =     71
 area set 3, end guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    196   197   206   205

    AREA NUMBER =     72

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    205   206   211   210

    AREA NUMBER =     73

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    206   207   212   211

    AREA NUMBER =     74

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    210   211   218   220

    AREA NUMBER =     75

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    148   161   158   149

    AREA NUMBER =     76

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    142   148   149   143

    AREA NUMBER =     77

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    143   149   150   144

    AREA NUMBER =     78

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     22   142   143    23
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    AREA NUMBER =      79

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      28     22     23     29

    AREA NUMBER =      80

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      29     23     24     30

    AREA NUMBER =      81

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      41     28     29     38

    AREA NUMBER =      82

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      95     94    107    104

    AREA NUMBER =      83

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      89     88     94     95

    AREA NUMBER =      84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      90     89     95     96

    AREA NUMBER =      85

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      78     77     88     89

    AREA NUMBER =      86
 area set 4, corner guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     219    220    221    162

    AREA NUMBER =      87

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     159    219    162    160

    AREA NUMBER =      88

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     160    162    163    161

    AREA NUMBER =      89

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     107    106     42    109

    AREA NUMBER =      90

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     106     39     40     42

    AREA NUMBER =      91

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      42     40     41     43

    AREA NUMBER =      92

ACTIVE COORDINATE SYSTEM SET TO       1  (CYLINDRICAL)
```

area set 5, inner barrier

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    222   223   224   207

    AREA NUMBER =     93

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    207   224   225   212

    AREA NUMBER =     94

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    212   225   226   218

    AREA NUMBER =     95

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    218   226   227   220

    AREA NUMBER =     96

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    220   227   228   221

    AREA NUMBER =     97

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    163   171   170   161

    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41
```

```
    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41     50     51     43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43     51    117    109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109    117    116    107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107    116    115    104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104    115    114     96

    AREA NUMBER =    111

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90     96    114    113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    113    112    110

    AREA NUMBER =    113
 area set 6, outer barrier

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    223    229    230    224

    AREA NUMBER =    114

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    224    230    231    225

    AREA NUMBER =    115

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    225    231    232    226

    AREA NUMBER =    116

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    226    232    233    227

    AREA NUMBER =    117

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    227    233    234    228

    AREA NUMBER =    118

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    228    234    178    171

    AREA NUMBER =    119

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    171    178    177    170
```

```
    AREA NUMBER =    120

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    170   177   176   169

    AREA NUMBER =    121

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    169   176   175   168

    AREA NUMBER =    122

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    168   175   174   167

    AREA NUMBER =    123

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    167   174    54    47

    AREA NUMBER =    124

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     47    54    55    48

    AREA NUMBER =    125

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     48    55    56    49

    AREA NUMBER =    126

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     49    56    57    50

    AREA NUMBER =    127

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     50    57    58    51

    AREA NUMBER =    128

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     51    58   124   117

    AREA NUMBER =    129

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    117   124   123   116

    AREA NUMBER =    130

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    116   123   122   115

    AREA NUMBER =    131

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    115   122   121   114

    AREA NUMBER =    132

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    114   121   120   113

    AREA NUMBER =    133

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    113   120   119   112
```

```
    AREA NUMBER =    134

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    229   235   236   230

    AREA NUMBER =    135

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    236   237   231   230

    AREA NUMBER =    136

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    231   237   238   232

    AREA NUMBER =    137

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    238   239   233   232

    AREA NUMBER =    138

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    239   240   234   233

    AREA NUMBER =    139

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    240   185   178   234

    AREA NUMBER =    140

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    185   184   177   178

    AREA NUMBER =    141

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    184   183   176   177

    AREA NUMBER =    142

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    176   183   182   175

    AREA NUMBER =    143

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    175   182   181   174

    AREA NUMBER =    144

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    174   181    61    54

    AREA NUMBER =    145

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     54    61    62    55

    AREA NUMBER =    146

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     55    62    63    56

    AREA NUMBER =    147

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     56    63    64    57
```

```
    AREA NUMBER =     148

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      57    64    65    58

    AREA NUMBER =     149

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =      58    65   131   124

    AREA NUMBER =     150

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     124   131   130   123

    AREA NUMBER =     151

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     123   130   129   122

    AREA NUMBER =     152

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     122   129   128   121

    AREA NUMBER =     153

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     121   128   127   120

    AREA NUMBER =     154

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     120   127   126   119

    AREA NUMBER =     155

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         1,

*** WARNING ***                         CP=      6.230   TIME= 16:21:46
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.230   TIME= 16:21:46
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.230   TIME= 16:21:46
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.230   TIME= 16:21:46
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.230   TIME= 16:21:46
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.240   TIME= 16:21:46
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.240   TIME= 16:21:46
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.240   TIME= 16:21:46
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.240   TIME= 16:21:46
Area 9 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.240   TIME= 16:21:46
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.250   TIME= 16:21:46
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.260   TIME= 16:21:46
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.260   TIME= 16:21:46
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.260   TIME= 16:21:46
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      6.260   TIME= 16:21:46
Area 32 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.260   TIME= 16:21:46
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 41 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.270   TIME= 16:21:46
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
```

```
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.280   TIME= 16:21:46
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.290   TIME= 16:21:46
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.300   TIME= 16:21:46
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.300   TIME= 16:21:46
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.300   TIME= 16:21:46
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.300   TIME= 16:21:46
Area 79 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 80 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 81 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 82 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 83 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 84 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 85 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.300 TIME= 16:21:46
Area 86 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 87 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 88 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 89 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 90 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 91 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 92 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 93 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 94 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 95 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 96 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.310 TIME= 16:21:46
Area 97 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.320 TIME= 16:21:46
Area 98 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.320 TIME= 16:21:46
Area 99 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.320 TIME= 16:21:46
Area 100 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.320 TIME= 16:21:46
Area 101 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 6.320 TIME= 16:21:46
Area 102 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.320   TIME= 16:21:46
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 114 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 115 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 117 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 118 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.330   TIME= 16:21:46
Area 120 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 121 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 123 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 124 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
```

```
Area 126 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 127 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 129 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 130 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.340   TIME= 16:21:46
Area 132 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 133 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 135 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 136 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 137 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 138 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 139 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 140 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 141 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 142 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.350   TIME= 16:21:46
Area 143 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 144 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 145 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 146 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 147 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 148 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 149 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 150 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 151 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 152 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 153 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 154 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      6.360   TIME= 16:21:46
Area 155 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5750     AND   4.5750
  KABS=  0.  TOLERANCE= 0.228750E-01

  155  AREAS (OF   679  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    63  AREAS (OF    679  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 483 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 486 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 490 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 493 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 496 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.560   TIME= 16:21:56
Area 500 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 16:21:56
Area 503 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 16:21:56
Area 506 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 16:21:56
Area 510 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 16:21:56
Area 513 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.570   TIME= 16:21:56
Area 517 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 520 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 524 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 527 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 530 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.570   TIME= 16:21:56
Area 537 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 540 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 544 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 551 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 555 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 561 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 564 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 567 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.580   TIME= 16:21:56
Area 573 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 576 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 579 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 585 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 588 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
Area 591 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.590   TIME= 16:21:56
```

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Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.590   TIME= 16:21:56
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.590   TIME= 16:21:56
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.590   TIME= 16:21:56
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.600   TIME= 16:21:56
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.600   TIME= 16:21:56
Area 609 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.600   TIME= 16:21:56
Area 612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 615 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 619 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 622 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 625 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.610   TIME= 16:21:56
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.620   TIME= 16:21:56
Area 664 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     15.620   TIME= 16:21:56
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.620   TIME= 16:21:56
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.620   TIME= 16:21:56
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.620   TIME= 16:21:56
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.630   TIME= 16:21:56
Area 679 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6050     AND   4.6050
  KABS=  0.  TOLERANCE= 0.230250E-01

   63  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5550     AND   4.5550
  KABS=  0.  TOLERANCE= 0.227750E-01

  155  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   892  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    417 USED FOR KEYPOINT(S)     609
KEYPOINT    419 USED FOR KEYPOINT(S)     610
KEYPOINT    421 USED FOR KEYPOINT(S)     611
KEYPOINT    423 USED FOR KEYPOINT(S)     546
KEYPOINT    425 USED FOR KEYPOINT(S)     628
KEYPOINT    427 USED FOR KEYPOINT(S)     630
KEYPOINT    429 USED FOR KEYPOINT(S)     584
KEYPOINT    431 USED FOR KEYPOINT(S)     612
KEYPOINT    433 USED FOR KEYPOINT(S)     615
KEYPOINT    435 USED FOR KEYPOINT(S)     616
KEYPOINT    437 USED FOR KEYPOINT(S)     619
KEYPOINT    439 USED FOR KEYPOINT(S)     620
KEYPOINT    441 USED FOR KEYPOINT(S)     621
KEYPOINT    443 USED FOR KEYPOINT(S)     602
KEYPOINT    445 USED FOR KEYPOINT(S)     633
KEYPOINT    447 USED FOR KEYPOINT(S)     632
KEYPOINT    449 USED FOR KEYPOINT(S)     580
KEYPOINT    451 USED FOR KEYPOINT(S)     623
KEYPOINT    453 USED FOR KEYPOINT(S)     626
KEYPOINT    454 USED FOR KEYPOINT(S)     625
LINE    960 USED FOR LINE(S)   1374
LINE    970 USED FOR LINE(S)   1377
LINE    975 USED FOR LINE(S)   1405
LINE    985 USED FOR LINE(S)   1410
LINE    990 USED FOR LINE(S)   1378
LINE   1000 USED FOR LINE(S)   1384
LINE   1010 USED FOR LINE(S)   1391
LINE   1020 USED FOR LINE(S)   1394
LINE   1025 USED FOR LINE(S)   1415
```

```
LINE    1035 USED FOR LINE(S)    1413
LINE    1040 USED FOR LINE(S)    1396
LINE    1046 USED FOR LINE(S)    1402
 lines tube height

LINE CONNECTS KEYPOINTS     502   509
 LINE NO.=  1374  KP1=     502  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     509  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     510   517
 LINE NO.=  1377  KP1=     510  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     517  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     518   525
 LINE NO.=  1378  KP1=     518  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     525  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     526   533
 LINE NO.=  1384  KP1=     526  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     533  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     534   541
 LINE NO.=  1391  KP1=     534  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     541  TAN2=     0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 end lines

LINE CONNECTS KEYPOINTS     627   457
 LINE NO.=  1394  KP1=     627  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     457  TAN2=     0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     414   606
 LINE NO.=  1396  KP1=     414  TAN1=     0.0000  -1.0000   0.0000
                  KP2=     606  TAN2=     0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =    955 1369 1373 1396
     (TRAVERSED IN SAME DIRECTION AS LINE    955)

    AREA NUMBER =     985

DEFINE AREA BY LIST OF LINES
     LINE LIST =   1189 1190 1194 1374
     (TRAVERSED IN SAME DIRECTION AS LINE   1189)

    AREA NUMBER =     986

DEFINE AREA BY LIST OF LINES
     LINE LIST =   1199 1200 1204 1377
     (TRAVERSED IN SAME DIRECTION AS LINE   1199)

    AREA NUMBER =     987

DEFINE AREA BY LIST OF LINES
     LINE LIST =   1209 1212 1214 1378
     (TRAVERSED IN SAME DIRECTION AS LINE   1209)

    AREA NUMBER =     988

DEFINE AREA BY LIST OF LINES
     LINE LIST =   1219 1222 1224 1384
     (TRAVERSED IN SAME DIRECTION AS LINE   1219)

    AREA NUMBER =     989
```

```
DEFINE AREA BY LIST OF LINES
     LINE LIST =  1229 1232 1234 1391
     (TRAVERSED IN SAME DIRECTION AS LINE  1229)

    AREA NUMBER =    990

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1055 1394 1400 1404
     (TRAVERSED IN SAME DIRECTION AS LINE  1055)

    AREA NUMBER =    991

DEFINE AREA BY LIST OF LINES
     LINE LIST =   965 1375 1376
     (TRAVERSED IN SAME DIRECTION AS LINE   965)

    AREA NUMBER =    992

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1238 1242 1243 1246
     (TRAVERSED IN SAME DIRECTION AS LINE  1238)

    AREA NUMBER =    993

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1250 1254 1255 1258
     (TRAVERSED IN SAME DIRECTION AS LINE  1250)

    AREA NUMBER =    994

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1263 1266 1268 1271
     (TRAVERSED IN SAME DIRECTION AS LINE  1263)

    AREA NUMBER =    995

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1274 1278 1281 1282
     (TRAVERSED IN SAME DIRECTION AS LINE  1274)

    AREA NUMBER =    996

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1286 1290 1293 1294
     (TRAVERSED IN SAME DIRECTION AS LINE  1286)

    AREA NUMBER =    997

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1045 1397 1401
     (TRAVERSED IN SAME DIRECTION AS LINE  1045)

    AREA NUMBER =    998

DEFINE AREA BY LIST OF LINES
     LINE LIST =   980 1406 1409
     (TRAVERSED IN SAME DIRECTION AS LINE   980)

    AREA NUMBER =    999

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1299 1302 1304 1307
     (TRAVERSED IN SAME DIRECTION AS LINE  1299)

    AREA NUMBER =   1000

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1311 1314 1316 1319
     (TRAVERSED IN SAME DIRECTION AS LINE  1311)
```

```
    AREA NUMBER =    1001

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1323 1326 1328 1331
     (TRAVERSED IN SAME DIRECTION AS LINE  1323)

    AREA NUMBER =    1002

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1030 1412 1416
     (TRAVERSED IN SAME DIRECTION AS LINE  1030)

    AREA NUMBER =    1003

DEFINE AREA BY LIST OF LINES
     LINE LIST =   995 1379 1383
     (TRAVERSED IN SAME DIRECTION AS LINE   995)

    AREA NUMBER =    1004

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1005 1385 1386 1390
     (TRAVERSED IN SAME DIRECTION AS LINE  1005)

    AREA NUMBER =    1005

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1015 1392 1393
     (TRAVERSED IN SAME DIRECTION AS LINE  1015)

    AREA NUMBER =    1006

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6050     AND   4.6050
  KABS=  0.  TOLERANCE= 0.230250E-01

  177  AREAS (OF  1006  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         3,

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 684 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 688 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 692 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 700 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 704 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 708 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 712 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 716 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.310   TIME= 16:22:03
Area 720 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 724 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 728 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 732 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 736 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 740 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 744 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 748 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 752 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 756 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 760 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 764 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.320   TIME= 16:22:03
Area 768 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 771 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 774 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 777 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 780 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 783 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 786 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 789 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 792 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.330   TIME= 16:22:03
Area 795 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.340   TIME= 16:22:03
Area 798 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.340   TIME= 16:22:03
Area 801 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 22.340 TIME= 16:22:03
Area 804 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.340 TIME= 16:22:03
Area 807 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.340 TIME= 16:22:03
Area 810 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.340 TIME= 16:22:03
Area 813 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.340 TIME= 16:22:03
Area 816 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 819 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 822 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 825 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 828 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 832 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 835 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 838 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 841 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 844 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.350 TIME= 16:22:03
Area 847 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 850 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 853 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 856 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 859 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 862 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 865 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 868 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.360 TIME= 16:22:03
Area 871 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.370 TIME= 16:22:03

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Area 874 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 877 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 880 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 883 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 886 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 889 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 892 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 893 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 894 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.370   TIME= 16:22:03
Area 895 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 896 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 897 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 898 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 899 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 900 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 901 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 902 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.380   TIME= 16:22:03
Area 903 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 904 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 905 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 906 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 907 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 908 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      22.390   TIME= 16:22:03
Area 909 is not meshed.  Volume will be generated without elements.
```

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*** WARNING ***                         CP=      22.390   TIME= 16:22:03
Area 910 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.390   TIME= 16:22:03
Area 911 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.390   TIME= 16:22:03
Area 912 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.390   TIME= 16:22:03
Area 913 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.390   TIME= 16:22:03
Area 914 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 915 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 916 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 917 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 918 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 919 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 920 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.400   TIME= 16:22:03
Area 921 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 922 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 923 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 924 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 925 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 926 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 927 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 928 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 929 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 930 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 931 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.410   TIME= 16:22:03
Area 932 is not meshed.  Volume will be generated without elements.
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*** WARNING ***                          CP=     22.410   TIME= 16:22:03
Area 933 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 934 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 935 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 936 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 937 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 938 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 939 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 940 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 941 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.420   TIME= 16:22:03
Area 942 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 943 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 944 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 945 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 946 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 947 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 948 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 949 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.430   TIME= 16:22:03
Area 950 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
Area 951 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
Area 952 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
Area 953 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
Area 954 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
Area 955 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     22.440   TIME= 16:22:03
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Area 956 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 957 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 958 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 959 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 960 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 961 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 962 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 963 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 964 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 965 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 966 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 967 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.440 TIME= 16:22:03
Area 968 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 969 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 970 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 971 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 972 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 973 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 974 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 975 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 976 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.450 TIME= 16:22:03
Area 977 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.460 TIME= 16:22:03
Area 978 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 22.460 TIME= 16:22:03
Area 979 is not meshed. Volume will be generated without elements.

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*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 980 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 981 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 982 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 983 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 984 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 985 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 986 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 987 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 988 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.460   TIME= 16:22:03
Area 989 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 990 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 991 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 992 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 993 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 994 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 995 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 996 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 997 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 998 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 999 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 1000 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.470   TIME= 16:22:03
Area 1001 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      22.480   TIME= 16:22:03
Area 1002 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     22.480   TIME= 16:22:03
Area 1003 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.480   TIME= 16:22:03
Area 1004 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.480   TIME= 16:22:03
Area 1005 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     22.480   TIME= 16:22:03
Area 1006 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6250     AND   4.6250
  KABS=  0.  TOLERANCE= 0.231250E-01

  177  AREAS (OF  1559  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.73095     AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00

   42  AREAS (OF  1559  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         4,

*** WARNING ***                         CP=     32.470   TIME= 16:22:14
Area 1095 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.470   TIME= 16:22:14
Area 1098 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.470   TIME= 16:22:14
Area 1101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.470   TIME= 16:22:14
Area 1104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.470   TIME= 16:22:14
Area 1107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
```

```
Area 1134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1137 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1140 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.480   TIME= 16:22:14
Area 1143 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1146 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1149 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1152 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1155 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1159 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1162 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1165 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1168 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1171 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1174 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.490   TIME= 16:22:14
Area 1177 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1180 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1183 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1186 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1189 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1192 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1195 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1198 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1201 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1204 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1207 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1210 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.500   TIME= 16:22:14
Area 1213 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.510   TIME= 16:22:14
Area 1216 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     32.510   TIME= 16:22:14
Area 1219 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6250     AND   4.6250
  KABS=  0.  TOLERANCE= 0.231250E-01

  326  AREAS (OF  1708  DEFINED) SELECTE) BY  ASEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.5950     AND   4.5950
  KABS=  0.  TOLERANCE= 0.229750E-01

  177  AREAS (OF  1708  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.73095
  KABS=  0.  TOLERANCE= 0.000000E+00

  135  AREAS (OF  1708  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.300E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    814 USED FOR KEYPOINT(S)     881
KEYPOINT    817 USED FOR KEYPOINT(S)     882
KEYPOINT    819 USED FOR KEYPOINT(S)     884
KEYPOINT    821 USED FOR KEYPOINT(S)     886
KEYPOINT    823 USED FOR KEYPOINT(S)     888
KEYPOINT    825 USED FOR KEYPOINT(S)     890
KEYPOINT    827 USED FOR KEYPOINT(S)     892
KEYPOINT    829 USED FOR KEYPOINT(S)     894
KEYPOINT    831 USED FOR KEYPOINT(S)     896
KEYPOINT    833 USED FOR KEYPOINT(S)     898
KEYPOINT    835 USED FOR KEYPOINT(S)     900
KEYPOINT    837 USED FOR KEYPOINT(S)     902
KEYPOINT    839 USED FOR KEYPOINT(S)     904
KEYPOINT    841 USED FOR KEYPOINT(S)     906
KEYPOINT    843 USED FOR KEYPOINT(S)     908
KEYPOINT    845 USED FOR KEYPOINT(S)     910
KEYPOINT    847 USED FOR KEYPOINT(S)     912
KEYPOINT    849 USED FOR KEYPOINT(S)     914
KEYPOINT    851 USED FOR KEYPOINT(S)     916
KEYPOINT    853 USED FOR KEYPOINT(S)     918
KEYPOINT    855 USED FOR KEYPOINT(S)     921
KEYPOINT    857 USED FOR KEYPOINT(S)     922
LINE   1995 USED FOR LINE(S)   2162
LINE   2000 USED FOR LINE(S)   2165
LINE   2005 USED FOR LINE(S)   2168
LINE   2010 USED FOR LINE(S)   2171
LINE   2015 USED FOR LINE(S)   2174
LINE   2020 USED FOR LINE(S)   2177
LINE   2025 USED FOR LINE(S)   2180
LINE   2030 USED FOR LINE(S)   2183
```

```
LINE    2035 USED FOR LINE(S)    2186
LINE    2040 USED FOR LINE(S)    2189
LINE    2045 USED FOR LINE(S)    2192
LINE    2050 USED FOR LINE(S)    2195
LINE    2055 USED FOR LINE(S)    2198
LINE    2060 USED FOR LINE(S)    2201
LINE    2065 USED FOR LINE(S)    2204
LINE    2070 USED FOR LINE(S)    2207
LINE    2075 USED FOR LINE(S)    2210
LINE    2080 USED FOR LINE(S)    2213
LINE    2085 USED FOR LINE(S)    2216
LINE    2090 USED FOR LINE(S)    2220
LINE    2095 USED FOR LINE(S)    2222

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.6550     AND   4.6550
  KABS=  0.  TOLERANCE= 0.232750E-01

  177  AREAS (OF  1843  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         5,

*** WARNING ***                          CP=     38.850   TIME= 16:22:20
Area 1564 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.850   TIME= 16:22:20
Area 1568 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.850   TIME= 16:22:20
Area 1572 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1576 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1580 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1584 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1588 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1592 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1608 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.860   TIME= 16:22:20
Area 1616 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1620 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1624 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.870   TIME= 16:22:20
Area 1660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1678 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1681 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1684 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1687 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1690 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.880   TIME= 16:22:20
Area 1693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1699 is not meshed.  Volume will be generated without elements.
```

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*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1708 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1709 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1710 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1711 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1712 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1713 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1714 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.890   TIME= 16:22:20
Area 1715 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1716 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1717 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1718 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1719 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1720 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1721 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1722 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1723 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1724 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1725 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.900   TIME= 16:22:20
Area 1726 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.910   TIME= 16:22:20
Area 1727 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.910   TIME= 16:22:20
Area 1728 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.910   TIME= 16:22:20
```

Area 1729 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1730 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1731 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1732 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1733 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1734 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1735 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1736 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.910 TIME= 16:22:20
Area 1737 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1738 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1739 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1740 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1741 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1742 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1743 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1744 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1745 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1746 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1747 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1748 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.920 TIME= 16:22:20
Area 1749 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1750 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1751 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1752 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1753 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1754 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1755 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1756 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1757 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1758 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1759 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.930 TIME= 16:22:20
Area 1760 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1761 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1762 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1763 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1764 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1765 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1766 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1767 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1768 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1769 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1770 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1771 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.940 TIME= 16:22:20
Area 1772 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.950 TIME= 16:22:20
Area 1773 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.950 TIME= 16:22:20
Area 1774 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.950 TIME= 16:22:20
Area 1775 is not meshed. Volume will be generated without elements.

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*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1776 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1777 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1778 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1779 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1780 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1781 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1782 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.950   TIME= 16:22:20
Area 1783 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1784 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1785 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1786 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1787 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1788 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1789 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1790 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1791 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1792 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1793 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.960   TIME= 16:22:20
Area 1794 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.970   TIME= 16:22:20
Area 1795 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.970   TIME= 16:22:20
Area 1796 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.970   TIME= 16:22:20
Area 1797 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.970   TIME= 16:22:20
Area 1798 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.970   TIME= 16:22:20
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Area 1799 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1800 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1801 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1802 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1803 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1804 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1805 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.970 TIME= 16:22:20
Area 1806 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1807 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1808 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1809 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1810 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1811 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1812 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1813 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1814 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1815 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1816 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.980 TIME= 16:22:20
Area 1817 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.990 TIME= 16:22:20
Area 1818 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.990 TIME= 16:22:20
Area 1819 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.990 TIME= 16:22:20
Area 1820 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.990 TIME= 16:22:20
Area 1821 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 38.990 TIME= 16:22:20
Area 1822 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1823 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1824 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1825 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1826 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1827 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     38.990   TIME= 16:22:20
Area 1828 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1829 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1830 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1831 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1832 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1833 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1834 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1835 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1836 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1837 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1838 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1839 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.000   TIME= 16:22:20
Area 1840 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.010   TIME= 16:22:20
Area 1841 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.010   TIME= 16:22:20
Area 1842 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     39.010   TIME= 16:22:20
Area 1843 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  4.7500     AND   4.7500
  KABS=  0.  TOLERANCE= 0.237500E-01

  177  AREAS (OF  2396  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

```
RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.77095     AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00

   21  AREAS (OF  2396  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         6,

*** WARNING ***                          CP=     49.040   TIME= 16:22:31
Area 1932 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1935 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1938 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1941 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1944 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1947 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1950 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1953 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1956 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1959 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.050   TIME= 16:22:31
Area 1962 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1965 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1968 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1971 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1974 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1977 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1980 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1983 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
Area 1986 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     49.060   TIME= 16:22:31
```

```
Area 1989 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     49.060   TIME= 16:22:31
Area 1992 is not meshed.  Volume will be generated without elements.
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=  3114  KP1=    195  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    194  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=  3115  KP1=    191  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    190  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=  3116  KP1=    187  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     68  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=  3117  KP1=     71  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     72  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=  3118  KP1=     75  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     76  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=  3119  KP1=    222  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    197  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=  3120  KP1=     78  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    110  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =    10  115  277 3119
     (TRAVERSED IN SAME DIRECTION AS LINE    10)

    AREA NUMBER =   2482

DEFINE AREA BY LIST OF LINES
     LINE LIST =    12   13   68 3114
     (TRAVERSED IN SAME DIRECTION AS LINE    12)

    AREA NUMBER =   2483

DEFINE AREA BY LIST OF LINES
     LINE LIST =    16   17   75 3115
     (TRAVERSED IN SAME DIRECTION AS LINE    16)

    AREA NUMBER =   2484

DEFINE AREA BY LIST OF LINES
     LINE LIST =    20   21   85 3116
     (TRAVERSED IN SAME DIRECTION AS LINE    20)

    AREA NUMBER =   2485

DEFINE AREA BY LIST OF LINES
     LINE LIST =    24   25   96 3117
     (TRAVERSED IN SAME DIRECTION AS LINE    24)

    AREA NUMBER =   2486
```

```
DEFINE AREA BY LIST OF LINES
     LINE LIST =    28   29  107 3118
     (TRAVERSED IN SAME DIRECTION AS LINE    28)

    AREA NUMBER =   2487

DEFINE AREA BY LIST OF LINES
     LINE LIST =    31  122  309 3120
     (TRAVERSED IN SAME DIRECTION AS LINE    31)

    AREA NUMBER =   2488

DEFINE AREA BY LIST OF LINES
     LINE LIST =    32  116  281
     (TRAVERSED IN SAME DIRECTION AS LINE    32)

    AREA NUMBER =   2489

DEFINE AREA BY LIST OF LINES
     LINE LIST =    34   35   71   72
     (TRAVERSED IN SAME DIRECTION AS LINE    34)

    AREA NUMBER =   2490

DEFINE AREA BY LIST OF LINES
     LINE LIST =    38   39   78   79
     (TRAVERSED IN SAME DIRECTION AS LINE    38)

    AREA NUMBER =   2491

DEFINE AREA BY LIST OF LINES
     LINE LIST =    42   43   88   89
     (TRAVERSED IN SAME DIRECTION AS LINE    42)

    AREA NUMBER =   2492

DEFINE AREA BY LIST OF LINES
     LINE LIST =    46   47   99  100
     (TRAVERSED IN SAME DIRECTION AS LINE    46)

    AREA NUMBER =   2493

DEFINE AREA BY LIST OF LINES
     LINE LIST =    50   51  110  111
     (TRAVERSED IN SAME DIRECTION AS LINE    50)

    AREA NUMBER =   2494

DEFINE AREA BY LIST OF LINES
     LINE LIST =    53  121  305
     (TRAVERSED IN SAME DIRECTION AS LINE    53)

    AREA NUMBER =   2495

DEFINE AREA BY LIST OF LINES
     LINE LIST =    54   74  285
     (TRAVERSED IN SAME DIRECTION AS LINE    54)

    AREA NUMBER =   2496

DEFINE AREA BY LIST OF LINES
     LINE LIST =    56   57   82   83
     (TRAVERSED IN SAME DIRECTION AS LINE    56)

    AREA NUMBER =   2497

DEFINE AREA BY LIST OF LINES
     LINE LIST =    60   61   92   93
     (TRAVERSED IN SAME DIRECTION AS LINE    60)
```

```
    AREA NUMBER =  2498

DEFINE AREA BY LIST OF LINES
     LINE LIST =    64   65  103  104
     (TRAVERSED IN SAME DIRECTION AS LINE    64)

    AREA NUMBER =  2499

DEFINE AREA BY LIST OF LINES
     LINE LIST =    67  113  301
     (TRAVERSED IN SAME DIRECTION AS LINE    67)

    AREA NUMBER =  2500

DEFINE AREA BY LIST OF LINES
     LINE LIST =   114  117  289
     (TRAVERSED IN SAME DIRECTION AS LINE   114)

    AREA NUMBER =  2501

DEFINE AREA BY LIST OF LINES
     LINE LIST =    95  118  119  293
     (TRAVERSED IN SAME DIRECTION AS LINE    95)

    AREA NUMBER =  2502

DEFINE AREA BY LIST OF LINES
     LINE LIST =   106  120  297
     (TRAVERSED IN SAME DIRECTION AS LINE   106)

    AREA NUMBER =  2503

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

  177  AREAS (OF  2503  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         7,

*** WARNING ***                         CP=     51.390   TIME= 16:22:33
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.400   TIME= 16:22:33
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
```

```
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.410   TIME= 16:22:33
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22;33
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.420   TIME= 16:22:33
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 33 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.430   TIME= 16:22:33
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 41 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.440   TIME= 16:22:33
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.450   TIME= 16:22:33
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 56 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 64 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.460   TIME= 16:22:33
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.470   TIME= 16:22:33
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.480   TIME= 16:22:33
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.480   TIME= 16:22:33
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.480   TIME= 16:22:33
```

Area 80 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 81 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 82 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 83 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 84 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 85 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.480 TIME= 16:22:33
Area 86 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 87 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16;22:33
Area 88 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 89 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 90 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 91 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 92 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 93 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 94 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 95 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.490 TIME= 16:22:33
Area 96 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 97 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 98 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 99 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 100 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 101 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 102 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 51.500 TIME= 16:22:33
Area 103 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=     51.500   TIME= 16:22:33
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.500   TIME= 16:22:33
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.500   TIME= 16:22:33
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.500   TIME= 16:22:33
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.500   TIME= 16:22:33
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 111 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 113 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 114 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 115 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 116 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 117 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 118 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.510   TIME= 16:22:33
Area 119 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 120 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 121 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 122 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 123 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 124 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 125 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 126 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 127 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 128 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 129 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.520   TIME= 16:22:33
Area 130 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 131 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 132 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 133 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 134 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 135 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 136 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 137 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 138 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 139 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 140 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.530   TIME= 16:22:33
Area 141 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 142 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 143 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 144 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 145 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 146 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 147 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 148 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 149 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
```

```
Area 150 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 151 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 152 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.540   TIME= 16:22:33
Area 153 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 154 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 155 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2482 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2483 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2484 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2485 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2486 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2487 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2488 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2489 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.550   TIME= 16:22:33
Area 2490 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2491 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2492 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2493 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2494 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2495 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2496 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2497 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2498 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2499 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2500 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.560   TIME= 16:22:33
Area 2501 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.570   TIME= 16:22:33
Area 2502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     51.570   TIME= 16:22:33
Area 2503 is not meshed.  Volume will be generated without elements.

*** NOTE ***                            CP=     52.480   TIME= 16:22:34
Page file used.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.25000E-01 AND -0.25000E-01
  KABS=  0.  TOLERANCE= 0.125000E-03

  177  AREAS (OF  3056  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         8,

*** WARNING ***                         CP=     63.520   TIME= 16:22:49
Area 2508 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2512 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2516 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2521 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2525 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2529 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2542 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.530   TIME= 16:22:49
Area 2551 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.540   TIME= 16:22:49
Area 2555 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.540   TIME= 16:22:49
Area 2560 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.540   TIME= 16:22:49
Area 2564 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     63.540   TIME= 16:22:49
```

Area 2568 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2573 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2577 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2581 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2584 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2589 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.540 TIME= 16:22:49
Area 2593 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2597 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2600 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2605 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2609 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2613 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2616 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2621 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2625 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2629 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.550 TIME= 16:22:49
Area 2632 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2637 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2641 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2645 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2648 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2653 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2657 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.560 TIME= 16:22:49
Area 2661 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     63.560   TIME= 16:22:49
Area 2664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.560   TIME= 16:22:49
Area 2669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.560   TIME= 16:22:49
Area 2673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2677 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2680 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2685 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2689 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2693 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2696 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2699 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.570   TIME= 16:22:49
Area 2707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2709 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2712 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2715 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2718 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2720 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2723 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2725 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2727 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2729 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2732 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     63.580   TIME= 16:22:49
Area 2735 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2737 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2740 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2742 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2744 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2746 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2749 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2752 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2754 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2756 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.590   TIME= 16:22:49
Area 2760 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2763 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2767 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2770 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2774 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2777 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2781 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2784 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2787 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2791 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2794 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.600   TIME= 16:22:49
Area 2798 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.610   TIME= 16:22:49
Area 2801 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.610   TIME= 16:22:49
```

Area 2805 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2808 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2812 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2814 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2817 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2821 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2823 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2826 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.610 TIME= 16:22:49
Area 2831 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2834 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2838 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2841 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2844 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2848 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2851 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2854 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2858 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2861 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.620 TIME= 16:22:49
Area 2865 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.630 TIME= 16:22:49
Area 2868 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.630 TIME= 16:22:49
Area 2872 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.630 TIME= 16:22:49
Area 2875 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.630 TIME= 16:22:49
Area 2878 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 63.630 TIME= 16:22:49
Area 2882 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                          CP=     63.630   TIME= 16:22:49
Area 2885 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.630   TIME= 16:22:49
Area 2888 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.630   TIME= 16:22:49
Area 2892 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.630   TIME= 16:22:49
Area 2895 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.630   TIME= 16:22:49
Area 2899 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2903 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2906 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2909 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2912 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2915 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2918 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2921 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2924 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2927 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.640   TIME= 16:22:49
Area 2930 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2933 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2936 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2939 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2942 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2945 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2948 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2951 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2954 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2957 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.650   TIME= 16:22:49
Area 2960 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2963 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2967 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2970 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2973 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2976 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2979 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2982 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2985 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2988 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.660   TIME= 16:22:49
Area 2991 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 2994 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 2997 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3000 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3003 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3006 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3009 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3012 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3015 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3018 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.670   TIME= 16:22:49
Area 3021 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.680   TIME= 16:22:49
Area 3024 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     63.680   TIME= 16:22:49
```

```
Area 3027 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3029 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3031 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3033 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3035 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3037 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3039 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3041 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3042 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.680   TIME= 16:22:49
Area 3043 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3044 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3045 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3046 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3047 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3048 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3049 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3050 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3051 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3052 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.690   TIME= 16:22:49
Area 3053 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.700   TIME= 16:22:49
Area 3054 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.700   TIME= 16:22:49
Area 3055 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      63.700   TIME= 16:22:49
Area 3056 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.13500     AND -0.13500
  KABS=  0.  TOLERANCE= 0.675000E-03
```

```
  177  AREAS (OF  3609  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT      FOR ITEM=LOC  COMPONENT=X      BETWEEN 0.77095      AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00

   21  AREAS (OF  3609  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         9,

*** WARNING ***                          CP=      75.070   TIME= 16:23:01
Area 3520 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3523 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3526 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3529 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3532 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3535 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3541 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3544 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3547 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.080   TIME= 16:23:01
Area 3550 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3553 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3556 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3559 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3562 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3565 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3568 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      75.090   TIME= 16:23:01
Area 3571 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     75.090   TIME= 16:23:01
Area 3574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     75.090   TIME= 16:23:01
Area 3577 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     75.090   TIME= 16:23:01
Area 3580 is not meshed.  Volume will be generated without elements.

 Mesh Volumes

 Mesh the CS Tubes


SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       47 STEP        1

   47  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      1

MATERIAL NUMBER SET TO     1

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

NUMBER OF VOLUMES MESHED   =     47
MAXIMUM NODE NUMBER        =   6176
MAXIMUM ELEMENT NUMBER     =   2820
 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     89.110   TIME= 16:23:16
Meshing of volume 50 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
         2941    2942    2943    2944    2945    2946    2947    2948
         2949    2950    2951    2952    2953    2954    2955


*** WARNING ***                         CP=     90.090   TIME= 16:23:17
Meshing of volume 55 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    55 WITH EXCESSIVE ASPECT RATIO ***
         3196    3197    3198    3199    3200    3201    3202    3203
         3204    3205    3206    3207    3208    3209    3210


*** WARNING ***                         CP=     90.430   TIME= 16:23:17
Meshing of volume 57 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    57 WITH EXCESSIVE ASPECT RATIO ***
         3271    3272    3273    3274    3275    3276    3277    3278
         3279    3280    3281    3282    3283    3284    3285


*** WARNING ***                         CP=     91.420   TIME= 16:23:18
Meshing of volume 62 produced 15 elements with excessive aspect ratio.
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 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    62 WITH EXCESSIVE ASPECT RATIO ***
         3526    3527    3528    3529    3530    3531    3532    3533
         3534    3535    3536    3537    3538    3539    3540


*** WARNING ***                          CP=     91.760   TIME= 16:23:18
Meshing of volume 64 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    64 WITH EXCESSIVE ASPECT RATIO ***
         3601    3602    3603    3604    3605    3606    3607    3608
         3609    3610    3611    3612    3613    3614    3615


*** WARNING ***                          CP=     92.710   TIME= 16:23:19
Meshing of volume 69 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
         3856    3857    3858    3859    3860    3861    3862    3863
         3864    3865    3866    3867    3868    3869    3870


NUMBER OF VOLUMES MESHED   =     24
MAXIMUM NODE NUMBER        =   6176
MAXIMUM ELEMENT NUMBER     =   3990
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP        1

   15  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     93.890   TIME= 16:23:20
Meshing of volume 73 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    73 WITH EXCESSIVE ASPECT RATIO ***
         4051    4052    4053    4054    4055    4056    4057    4058
         4059    4060    4061    4062    4063    4064    4065


*** WARNING ***                          CP=     94.170   TIME= 16:23:21
Volume 75 area 75 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     94.180   TIME= 16:23:21
Volume 75 area 422 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     94.320   TIME= 16:23:21
Meshing of volume 75 produced 30 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    75 WITH EXCESSIVE DISTORTION ***
         4156    4157    4158    4159    4160    4161    4162    4163
         4164    4165    4166    4167    4168    4169    4170    4171
         4172    4173    4174    4175    4176    4177    4178    4179
         4180    4181    4182    4183    4184    4185


*** WARNING ***                          CP=     94.400   TIME= 16:23:21
Volume 76 area 76 has a corner angle of 30 degrees.  This is not
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recommended for hexahedral elements.

*** WARNING *** CP= 94.410 TIME= 16:23:21
Volume 76 area 426 has a corner angle of 30 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 94.550 TIME= 16:23:21
Meshing of volume 76 produced 30 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 76 WITH EXCESSIVE DISTORTION ***

4186	4187	4190	4191	4194	4195	4198	4199
4202	4203	4206	4207	4210	4211	4214	4215
4218	4219	4222	4223	4226	4227	4230	4231
4234	4235	4238	4239	4242	4243		

*** WARNING *** CP= 94.670 TIME= 16:23:21
Meshing of volume 77 produced 15 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 77 WITH EXCESSIVE ASPECT RATIO ***

4246	4247	4248	4249	4250	4251	4252	4253
4254	4255	4256	4257	4258	4259	4260	

*** WARNING *** CP= 95.210 TIME= 16:23:22
Meshing of volume 80 produced 15 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 80 WITH EXCESSIVE ASPECT RATIO ***

4381	4382	4383	4384	4385	4386	4387	4388
4389	4390	4391	4392	4393	4394	4395	

*** WARNING *** CP= 95.520 TIME= 16:23:22
Volume 82 area 82 has a corner angle of 150 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 95.520 TIME= 16:23:22
Volume 82 area 446 has a corner angle of 150 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 95.650 TIME= 16:23:22
Meshing of volume 82 produced 30 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 82 WITH EXCESSIVE DISTORTION ***

4458	4459	4462	4463	4466	4467	4470	4471
4474	4475	4478	4479	4482	4483	4486	4487
4490	4491	4494	4495	4498	4499	4502	4503
4506	4507	4510	4511	4514	4515		

*** WARNING *** CP= 95.740 TIME= 16:23:22
Volume 83 area 83 has a corner angle of 30 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 95.750 TIME= 16:23:22
Volume 83 area 450 has a corner angle of 30 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 95.890 TIME= 16:23:23
Meshing of volume 83 produced 30 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 83 WITH EXCESSIVE DISTORTION ***

4546	4547	4548	4549	4550	4551	4552	4553
4554	4555	4556	4557	4558	4559	4560	4561
4562	4563	4564	4565	4566	4567	4568	4569
4570	4571	4572	4573	4574	4575		

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*** WARNING ***                         CP=     96.020   TIME= 16:23:23
Meshing of volume 84 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
         4576    4577    4578    4579    4580    4581    4582    4583
         4584    4585    4586    4587    4588    4589    4590


NUMBER OF VOLUMES MESHED   =     15
MAXIMUM NODE NUMBER        =   7248
MAXIMUM ELEMENT NUMBER     =   4710
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP       1

    6  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     96.950   TIME= 16:23:24
Meshing of volume 88 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
         4771    4772    4773    4774    4775    4776    4777    4778
         4779    4780    4781    4782    4783    4784    4785


*** WARNING ***                         CP=     97.500   TIME= 16:23:24
Meshing of volume 91 produced 15 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
         4906    4907    4908    4909    4910    4911    4912    4913
         4914    4915    4916    4917    4918    4919    4920


NUMBER OF VOLUMES MESHED   =      6
MAXIMUM NODE NUMBER        =   7536
MAXIMUM ELEMENT NUMBER     =   4980
 Mesh Inner Barrier

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.25000E-01 AND   4.6100
  KABS=  0.  TOLERANCE= 0.000000E+00

  572  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.73095
  KABS=  0.  TOLERANCE= 0.000000E+00

  404  VOLUMES (OF  1010  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP       1

   312  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      5

MATERIAL NUMBER SET TO     5
```

GENERATE NODES AND ELEMENTS IN ALL SELECTED VOLUMES

*** WARNING *** CP= 120.260 TIME= 16:23:56
Volume 356 area 967 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.270 TIME= 16:23:56
Volume 356 area 1484 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.290 TIME= 16:23:56
Meshing of volume 356 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 356 WITH EXCESSIVE DISTORTION ***
6890 6891

*** WARNING *** CP= 120.330 TIME= 16:23:57
Volume 357 area 968 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.340 TIME= 16:23:57
Volume 357 area 1487 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.360 TIME= 16:23:57
Meshing of volume 357 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 357 WITH EXCESSIVE DISTORTION ***
6892 6893

*** WARNING *** CP= 120.700 TIME= 16:23:57
Volume 363 area 974 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.710 TIME= 16:23:57
Volume 363 area 1504 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.730 TIME= 16:23:57
Meshing of volume 363 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 363 WITH EXCESSIVE DISTORTION ***
6912 6913

*** WARNING *** CP= 120.780 TIME= 16:23:57
Volume 364 area 975 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.790 TIME= 16:23:57
Volume 364 area 1507 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 120.810 TIME= 16:23:57
Meshing of volume 364 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 364 WITH EXCESSIVE DISTORTION ***
6916 6917

*** WARNING *** CP= 122.010 TIME= 16:23:58
Volume 381 area 992 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 122.020 TIME= 16:23:58
Volume 381 area 1545 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

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*** WARNING ***                          CP=    122.060   TIME= 16:23:58
Meshing of volume 381 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   381 WITH EXCESSIVE DISTORTION ***
         7057    7058    7059    7060    7062    7064    7066


*** WARNING ***                          CP=    122.510   TIME= 16:23:59
Volume 387 area 998 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    122.530   TIME= 16:23:59
Volume 387 area 1551 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    122.570   TIME= 16:23:59
Meshing of volume 387 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   387 WITH EXCESSIVE DISTORTION ***
         7150    7153    7154    7157    7158    7159    7160


*** WARNING ***                          CP=    122.650   TIME= 16:23:59
Meshing of volume 388 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   388 WITH EXCESSIVE DISTORTION ***
         7166


*** WARNING ***                          CP=    122.970   TIME= 16:23:59
Meshing of volume 392 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   392 WITH EXCESSIVE DISTORTION ***
         7226


*** WARNING ***                          CP=    123.000   TIME= 16:23:59
Volume 393 area 1004 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.010   TIME= 16:23:59
Volume 393 area 1557 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.060   TIME= 16:23:59
Meshing of volume 393 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   393 WITH EXCESSIVE DISTORTION ***
         7234    7237    7238    7241    7242    7243    7244


*** WARNING ***                          CP=    123.180   TIME= 16:23:59
Volume 395 area 1006 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.190   TIME= 16:24:00
Volume 395 area 1559 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    123.230   TIME= 16:24:00
Meshing of volume 395 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   395 WITH EXCESSIVE DISTORTION ***
         7261    7262    7263    7264    7266    7268    7270


*** WARNING ***                          CP=    129.050   TIME= 16:24:08
Volume 710 area 75 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.
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*** WARNING ***                         CP=     129.070   TIME= 16:24:08
Volume 710 area 2770 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.100   TIME= 16:24:08
Meshing of volume 710 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   710 WITH EXCESSIVE DISTORTION ***
         7550    7551


*** WARNING ***                         CP=     129.140   TIME= 16:24:08
Volume 711 area 76 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.150   TIME= 16:24:08
Volume 711 area 2774 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.180   TIME= 16:24:08
Meshing of volume 711 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   711 WITH EXCESSIVE DISTORTION ***
         7552    7553


*** WARNING ***                         CP=     129.670   TIME= 16:24:08
Volume 717 area 82 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.690   TIME= 16:24:08
Volume 717 area 2794 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.710   TIME= 16:24:08
Meshing of volume 717 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   717 WITH EXCESSIVE DISTORTION ***
         7572    7573


*** WARNING ***                         CP=     129.760   TIME= 16:24:08
Volume 718 area 83 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.770   TIME= 16:24:08
Volume 718 area 2798 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     129.800   TIME= 16:24:08
Meshing of volume 718 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   718 WITH EXCESSIVE DISTORTION ***
         7576    7577


*** WARNING ***                         CP=     133.270   TIME= 16:24:13
Volume 798 area 2489 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     133.290   TIME= 16:24:13
Volume 798 area 3042 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     133.330   TIME= 16:24:13
Meshing of volume 798 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   798 WITH EXCESSIVE DISTORTION ***
         7813    7814    7817    7818    7819    7820    7822
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*** WARNING ***                          CP=    133.810   TIME= 16:24:13
Volume 804 area 2495 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    133.820   TIME= 16:24:13
Volume 804 area 3048 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    133.860   TIME= 16:24:13
Meshing of volume 804 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   804 WITH EXCESSIVE DISTORTION ***
         7906    7908    7910    7913    7914    7915    7916


*** WARNING ***                          CP=    133.950   TIME= 16:24:14
Meshing of volume 805 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   805 WITH EXCESSIVE DISTORTION ***
         7918


*** WARNING ***                          CP=    134.290   TIME= 16:24:14
Meshing of volume 809 produced 1 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   809 WITH EXCESSIVE DISTORTION ***
         7978


*** WARNING ***                          CP=    134.310   TIME= 16:24:14
Volume 810 area 2501 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    134.330   TIME= 16:24:14
Volume 810 area 3054 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    134.370   TIME= 16:24:14
Meshing of volume 810 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   810 WITH EXCESSIVE DISTORTION ***
         7989    7990    7991    7992    7994    7996    7998


*** WARNING ***                          CP=    134.480   TIME= 16:24:14
Volume 812 area 2503 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    134.500   TIME= 16:24:14
Volume 812 area 3056 has a corner angle of 29 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    134.540   TIME= 16:24:14
Meshing of volume 812 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   812 WITH EXCESSIVE DISTORTION ***
         8017    8018    8021    8022    8023    8024    8026


NUMBER OF VOLUMES MESHED   =    312
MAXIMUM NODE NUMBER        =  12190
MAXIMUM ELEMENT NUMBER     =   8028
 Mesh Lower Outer Barrier and Lids

INVERT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO     1010 STEP        1

  698  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL  COMMAND.
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UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   606  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.73095     AND  0.83095
  KABS=  0.  TOLERANCE= 0.000000E+00

   270  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
  KABS=  0.  TOLERANCE= 0.000000E+00

  666  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   616  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        5 STEP        1

   446  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ELEMENT TYPE SET TO      6

MATERIAL NUMBER SET TO     6

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=    165.640   TIME= 16:25:04
Volume 575 area 1804 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    165.650   TIME= 16:25:04
Volume 575 area 2321 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    165.670   TIME= 16:25:04
Meshing of volume 575 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   575 WITH EXCESSIVE DISTORTION ***
        10378   10379


*** WARNING ***                          CP=    165.730   TIME= 16:25:04
Volume 576 area 1805 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    165.740   TIME= 16:25:04
Volume 576 area 2324 has a corner angle of 30 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    165.770   TIME= 16:25:04
Meshing of volume 576 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   576 WITH EXCESSIVE DISTORTION ***
        10380   10381


*** WARNING ***                          CP=    166.160   TIME= 16:25:05
Volume 582 area 1811 has a corner angle of 150 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=    166.170   TIME= 16:25:05
Volume 582 area 2341 has a corner angle of 150 degrees.  This is not
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recommended for hexahedral elements.

*** WARNING *** CP= 166.190 TIME= 16:25:05
Meshing of volume 582 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 582 WITH EXCESSIVE DISTORTION ***
10400 10401

*** WARNING *** CP= 166.230 TIME= 16:25:05
Volume 583 area 1812 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 166.240 TIME= 16:25:05
Volume 583 area 2344 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 166.260 TIME= 16:25:05
Meshing of volume 583 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 583 WITH EXCESSIVE DISTORTION ***
10404 10405

*** WARNING *** CP= 167.490 TIME= 16:25:06
Volume 600 area 1829 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 167.510 TIME= 16:25:06
Volume 600 area 2382 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 167.550 TIME= 16:25:06
Meshing of volume 600 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 600 WITH EXCESSIVE DISTORTION ***
10545 10546 10547 10548 10550 10552 10554

*** WARNING *** CP= 168.030 TIME= 16:25:07
Volume 606 area 1835 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.040 TIME= 16:25:07
Volume 606 area 2388 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.080 TIME= 16:25:07
Meshing of volume 606 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 606 WITH EXCESSIVE DISTORTION ***
10638 10641 10642 10645 10646 10647 10648

*** WARNING *** CP= 168.160 TIME= 16:25:07
Meshing of volume 607 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 607 WITH EXCESSIVE DISTORTION ***
10654

*** WARNING *** CP= 168.510 TIME= 16:25:07
Meshing of volume 611 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 611 WITH EXCESSIVE DISTORTION ***
10714

*** WARNING *** CP= 168.530 TIME= 16:25:07
Volume 612 area 1841 has a corner angle of 29 degrees. This is not

recommended for hexahedral elements.

*** WARNING *** CP= 168.550 TIME= 16:25:08
Volume 612 area 2394 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.590 TIME= 16:25:08
Meshing of volume 612 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 612 WITH EXCESSIVE DISTORTION ***
10722 10725 10726 10729 10730 10731 10732

*** WARNING *** CP= 168.700 TIME= 16:25:08
Volume 614 area 1843 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.720 TIME= 16:25:08
Volume 614 area 2396 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 168.750 TIME= 16:25:08
Meshing of volume 614 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 614 WITH EXCESSIVE DISTORTION ***
10749 10750 10751 10752 10754 10756 10758

*** WARNING *** CP= 177.090 TIME= 16:25:22
Volume 887 area 2770 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.100 TIME= 16:25:22
Volume 887 area 3323 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.120 TIME= 16:25:22
Meshing of volume 887 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 887 WITH EXCESSIVE DISTORTION ***
11194 11195

*** WARNING *** CP= 177.160 TIME= 16:25:22
Volume 888 area 2774 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.170 TIME= 16:25:22
Volume 888 area 3327 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.190 TIME= 16:25:22
Meshing of volume 888 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 888 WITH EXCESSIVE DISTORTION ***
11196 11197

*** WARNING *** CP= 177.570 TIME= 16:25:22
Volume 894 area 2794 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.580 TIME= 16:25:22
Volume 894 area 3347 has a corner angle of 150 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.600 TIME= 16:25:22
Meshing of volume 894 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 894 WITH EXCESSIVE DISTORTION ***

11216 11217

*** WARNING *** CP= 177.650 TIME= 16:25:22
Volume 895 area 2798 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.660 TIME= 16:25:22
Volume 895 area 3351 has a corner angle of 30 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 177.680 TIME= 16:25:22
Meshing of volume 895 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 895 WITH EXCESSIVE DISTORTION ***
11220 11221

*** WARNING *** CP= 182.680 TIME= 16:25:28
Volume 975 area 3595 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 182.730 TIME= 16:25:28
Meshing of volume 975 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 975 WITH EXCESSIVE DISTORTION ***
11561 11562 11565 11566 11567 11568 11570

*** WARNING *** CP= 183.220 TIME= 16:25:29
Volume 981 area 3601 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 183.260 TIME= 16:25:29
Meshing of volume 981 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 981 WITH EXCESSIVE DISTORTION ***
11654 11656 11658 11661 11662 11663 11664

*** WARNING *** CP= 183.330 TIME= 16:25:29
Meshing of volume 982 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 982 WITH EXCESSIVE DISTORTION ***
11666

*** WARNING *** CP= 183.720 TIME= 16:25:29
Meshing of volume 986 produced 1 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 986 WITH EXCESSIVE DISTORTION ***
11726

*** WARNING *** CP= 183.760 TIME= 16:25:30
Volume 987 area 3607 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 183.770 TIME= 16:25:30
Meshing of volume 987 produced 7 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 987 WITH EXCESSIVE DISTORTION ***
11737 11738 11739 11740 11742 11744 11746

*** WARNING *** CP= 183.910 TIME= 16:25:30
Volume 989 area 3609 has a corner angle of 29 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 183.960 TIME= 16:25:30

```
Meshing of volume 989 produced 7 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   989 WITH EXCESSIVE DISTORTION ***
       11765   11766   11769   11770   11771   11772   11774


NUMBER OF VOLUMES MESHED   =    446
MAXIMUM NODE NUMBER        =  17143
MAXIMUM ELEMENT NUMBER     =  11828
 mesh upper outer barrier adding backfill mass

INVERT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO     1010 STEP        1

  564  VOLUMES (OF  1010  DEFINED) SELECTED BY VSEL  COMMAND.

UNSELECT     FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        5 STEP        1

   160  VOLUMES (OF   1010  DEFINED) SELECTED BY VSEL COMMAND.

ELEMENT TYPE SET TO      7

MATERIAL NUMBER SET TO     7

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

NUMBER OF VOLUMES MESHED   =    160
MAXIMUM NODE NUMBER        =  19211
MAXIMUM ELEMENT NUMBER     =  13764

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   951  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=    206.430   TIME= 16:26:16
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   951
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.90500     AND   1.2300
  KABS=  0.  TOLERANCE= 0.000000E+00

  1588  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Z     BETWEEN  3.3450     AND   3.6700
  KABS=  0.  TOLERANCE= 0.000000E+00

  3176  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.82995     AND  0.83195
  KABS=  0.  TOLERANCE= 0.000000E+00

   196  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00
```

```
    20  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

 SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   19211 BY       1
 REAL= 0.000000000E+00   IMAG= 0.000000000E+00

 SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

 ALL SELECT   FOR ITEM=VOLU COMPONENT=
  IN RANGE       1 TO     1010 STEP        1

   1010  VOLUMES (OF   1010  DEFINED) SELECTED BY  VSEL  COMMAND.

 ALL SELECT   FOR ITEM=AREA COMPONENT=
  IN RANGE       1 TO     3694 STEP        1

  3694  AREAS (OF  3694  DEFINED) SELECTED BY ASEL COMMAND.

 ALL SELECT   FOR ITEM=LINE COMPONENT=
  IN RANGE       1 TO     4380 STEP        1

  4380  LINES (OF  4380  DEFINED) SELECTED BY LSEL COMMAND.

 ALL SELECT   FOR ITEM=KP   COMPONENT=
  IN RANGE       1 TO     9001 STEP        1

   1710  KEYPOINTS (OF   1710  DEFINED) SELECTED BY  KSEL  COMMAND.

 ALL SELECT   FOR ITEM=ELEM COMPONENT=
  IN RANGE       1 TO    13764 STEP        1

  13764  ELEMENTS (OF  13764  DEFINED) SELECTED BY  ESEL  COMMAND.

 ALL SELECT   FOR ITEM=NODE COMPONENT=
  IN RANGE       1 TO    19211 STEP        1

  19211  NODES (OF  19211  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
  FOR POSSIBLE RESUME FROM THIS POINT


 ***** ROUTINE COMPLETED *****  CP =       238.010


 *****  ANSYS SOLUTION ROUTINE  *****


 PERFORM A MODAL ANALYSIS
  THIS WILL BE A NEW ANALYSIS


 USE SUBSPACE ITERATION METHOD
  EXTRACT    1 MODES
  NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

 WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
   FOR ALL APPLICABLE ENTITIES

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
  FOR POSSIBLE RESUME FROM THIS POINT

 *****  ANSYS SOLVE    COMMAND  *****

 *** WARNING ***                         CP=    278.300   TIME= 16:32:12
 Element 4156 has an angle between adjacent edges of 38.4597531 on face
  2 which is outside the recommended range of 90 plus or minus 45
  degrees.
```

*** WARNING *** CP= 278.300 TIME= 16:32:12
Element 4156 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.300 TIME= 16:32:12
Element 4157 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.300 TIME= 16:32:12
Element 4157 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.300 TIME= 16:32:12
Element 4158 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4158 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4159 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4159 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4160 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4160 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.320 TIME= 16:32:12
Element 4161 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4161 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4162 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4162 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4163 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4163 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.330 TIME= 16:32:12
Element 4164 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4164 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4165 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4165 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4166 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4166 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.340 TIME= 16:32:12
Element 4167 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4167 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4168 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4168 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4169 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4169 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.350 TIME= 16:32:12
Element 4170 has an angle between adjacent edges of 38.4597531 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

```
*** WARNING ***                          CP=    278.360   TIME= 16:32:12
Element 4170 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.360   TIME= 16:32:12
Element 4171 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.360   TIME= 16:32:12
Element 4171 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.360   TIME= 16:32:12
Element 4172 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.360   TIME= 16:32:12
Element 4172 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4173 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4173 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4174 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4174 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4175 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.370   TIME= 16:32:12
Element 4175 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.380   TIME= 16:32:12
Element 4176 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.380   TIME= 16:32:12
Element 4176 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.380   TIME= 16:32:12
Element 4177 has an angle between adjacent edges of 30.0613937 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

*** WARNING *** CP= 278.380 TIME= 16:32:12
Element 4177 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.380 TIME= 16:32:12
Element 4178 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.380 TIME= 16:32:12
Element 4178 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4179 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4179 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4180 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4180 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4181 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.390 TIME= 16:32:12
Element 4181 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4182 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4182 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4183 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4183 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4184 has an angle between adjacent edges of 30.0613937 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.400 TIME= 16:32:12
Element 4184 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.410 TIME= 16:32:12
Element 4185 has an angle between adjacent edges of 30.0613937 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.410 TIME= 16:32:12
Element 4185 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.410 TIME= 16:32:12
Element 4186 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.410 TIME= 16:32:12
Element 4186 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.410 TIME= 16:32:12
Element 4187 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.420 TIME= 16:32:12
Element 4187 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.420 TIME= 16:32:12
Element 4190 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.420 TIME= 16:32:12
Element 4190 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.420 TIME= 16:32:12
Element 4191 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.420 TIME= 16:32:12
Element 4191 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.430 TIME= 16:32:12
Element 4194 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.430 TIME= 16:32:12
Element 4194 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.430 TIME= 16:32:12
Element 4195 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

```
*** WARNING ***                          CP=    278.430   TIME= 16:32:12
Element 4195 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.430   TIME= 16:32:12
Element 4198 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.440   TIME= 16:32:12
Element 4198 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.440   TIME= 16:32:12
Element 4199 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.440   TIME= 16:32:12
Element 4199 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.440   TIME= 16:32:12
Element 4202 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.440   TIME= 16:32:12
Element 4202 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.450   TIME= 16:32:12
Element 4203 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.450   TIME= 16:32:12
Element 4203 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.450   TIME= 16:32:12
Element 4206 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.450   TIME= 16:32:12
Element 4206 has an angle between adjacent edges of 149.933722 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.450   TIME= 16:32:12
Element 4207 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.460   TIME= 16:32:12
Element 4207 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.460   TIME= 16:32:12
Element 4210 has an angle between adjacent edges of 38.4646378 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

*** WARNING *** CP= 278.460 TIME= 16:32:12
Element 4210 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.460 TIME= 16:32:12
Element 4211 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.460 TIME= 16:32:12
Element 4211 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.470 TIME= 16:32:12
Element 4214 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.470 TIME= 16:32:12
Element 4214 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.470 TIME= 16:32:12
Element 4215 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.470 TIME= 16:32:12
Element 4215 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.470 TIME= 16:32:12
Element 4218 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.480 TIME= 16:32:12
Element 4218 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.480 TIME= 16:32:12
Element 4219 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.480 TIME= 16:32:12
Element 4219 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.480 TIME= 16:32:12
Element 4222 has an angle between adjacent edges of 38.4646378 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.480 TIME= 16:32:12
Element 4222 has an angle between adjacent edges of 149.933722 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.490 TIME= 16:32:12
Element 4223 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.490 TIME= 16:32:12
Element 4223 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.490 TIME= 16:32:12
Element 4226 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.490 TIME= 16:32:12
Element 4226 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.490 TIME= 16:32:12
Element 4227 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.500 TIME= 16:32:12
Element 4227 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.500 TIME= 16:32:12
Element 4230 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.500 TIME= 16:32:12
Element 4230 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.500 TIME= 16:32:12
Element 4231 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.500 TIME= 16:32:12
Element 4231 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.510 TIME= 16:32:12
Element 4234 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.510 TIME= 16:32:12
Element 4234 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.510 TIME= 16:32:12
Element 4235 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.510 TIME= 16:32:12
Element 4235 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.520 TIME= 16:32:12
Element 4238 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.520 TIME= 16:32:12
Element 4238 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.520 TIME= 16:32:12
Element 4239 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.520 TIME= 16:32:12
Element 4239 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.520 TIME= 16:32:12
Element 4242 has an angle between adjacent edges of 38.4646378 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.530 TIME= 16:32:12
Element 4242 has an angle between adjacent edges of 149.933722 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.530 TIME= 16:32:12
Element 4243 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.530 TIME= 16:32:12
Element 4243 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.670 TIME= 16:32:12
Element 4458 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.670 TIME= 16:32:12
Element 4458 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.680 TIME= 16:32:12
Element 4459 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.680 TIME= 16:32:12
Element 4459 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.680 TIME= 16:32:12
Element 4462 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.680 TIME= 16:32:12
Element 4462 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.680 TIME= 16:32:12
Element 4463 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

```
*** WARNING ***                          CP=    278.690   TIME= 16:32:12
Element 4463 has an angle between adjacent edges of 38.4646378 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.690   TIME= 16:32:12
Element 4466 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.690   TIME= 16:32:12
Element 4466 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.690   TIME= 16:32:12
Element 4467 has an angle between adjacent edges of 149.933722 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.690   TIME= 16:32:12
Element 4467 has an angle between adjacent edges of 38.4646378 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.700   TIME= 16:32:12
Element 4470 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.700   TIME= 16:32:12
Element 4470 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.700   TIME= 16:32:12
Element 4471 has an angle between adjacent edges of 149.933722 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.700   TIME= 16:32:12
Element 4471 has an angle between adjacent edges of 38.4646378 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.710   TIME= 16:32:12
Element 4474 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.710   TIME= 16:32:12
Element 4474 has an angle between adjacent edges of 141.535362 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.710   TIME= 16:32:12
Element 4475 has an angle between adjacent edges of 149.933722 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.710   TIME= 16:32:12
Element 4475 has an angle between adjacent edges of 38.4646378 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=    278.710   TIME= 16:32:12
Element 4478 has an angle between adjacent edges of 141.535362 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.
```

*** WARNING *** CP= 278.720 TIME= 16:32:12
Element 4478 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.720 TIME= 16:32:12
Element 4479 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.720 TIME= 16:32:12
Element 4479 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.720 TIME= 16:32:12
Element 4482 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.730 TIME= 16:32:12
Element 4482 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.730 TIME= 16:32:12
Element 4483 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.730 TIME= 16:32:12
Element 4483 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.730 TIME= 16:32:12
Element 4486 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.730 TIME= 16:32:12
Element 4486 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.740 TIME= 16:32:12
Element 4487 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.740 TIME= 16:32:12
Element 4487 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.740 TIME= 16:32:12
Element 4490 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.740 TIME= 16:32:12
Element 4490 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.740 TIME= 16:32:12
Element 4491 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.750 TIME= 16:32:12
Element 4491 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.750 TIME= 16:32:12
Element 4494 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.750 TIME= 16:32:12
Element 4494 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.750 TIME= 16:32:12
Element 4495 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.750 TIME= 16:32:12
Element 4495 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.760 TIME= 16:32:12
Element 4498 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.760 TIME= 16:32:12
Element 4498 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.760 TIME= 16:32:12
Element 4499 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.760 TIME= 16:32:12
Element 4499 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.760 TIME= 16:32:12
Element 4502 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.770 TIME= 16:32:12
Element 4502 has an angle between adjacent edges of 141.535362 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.770 TIME= 16:32:12
Element 4503 has an angle between adjacent edges of 149.933722 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.770 TIME= 16:32:12
Element 4503 has an angle between adjacent edges of 38.4646378 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.770 TIME= 16:32:12
Element 4506 has an angle between adjacent edges of 141.535362 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 278.770 TIME= 16:32:12
Element 4506 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.780 TIME= 16:32:12
Element 4507 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.780 TIME= 16:32:12
Element 4507 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.780 TIME= 16:32:12
Element 4510 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.780 TIME= 16:32:12
Element 4510 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.780 TIME= 16:32:12
Element 4511 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.800 TIME= 16:32:13
Element 4511 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.800 TIME= 16:32:13
Element 4514 has an angle between adjacent edges of 141.535362 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.800 TIME= 16:32:13
Element 4514 has an angle between adjacent edges of 141.535362 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.800 TIME= 16:32:13
Element 4515 has an angle between adjacent edges of 149.933722 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.800 TIME= 16:32:13
Element 4515 has an angle between adjacent edges of 38.4646378 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4546 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4546 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4547 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4547 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4548 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.830 TIME= 16:32:13
Element 4548 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4549 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4549 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4550 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4550 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4551 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.840 TIME= 16:32:13
Element 4551 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.850 TIME= 16:32:13
Element 4552 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.850 TIME= 16:32:13
Element 4552 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.850 TIME= 16:32:13
Element 4553 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.850 TIME= 16:32:13
Element 4553 has an angle between adjacent edges of 141.535362 on face
5 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 278.850 TIME= 16:32:13
Element 4554 has an angle between adjacent edges of 38.4597531 on face
3 which is outside the recommended range of 90 plus or minus 45
degrees.

```
*** WARNING ***                         CP=    278.850   TIME= 16:32:13
Element 4554 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=    278.860   TIME= 16:32:13
Element 4555 has an angle between adjacent edges of 38.4597531 on face
 3 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=    278.860   TIME= 16:32:13
Element 4555 has an angle between adjacent edges of 141.535362 on face
 5 which is outside the recommended range of 90 plus or minus 45
 degrees.

***************************************************************************
Error messages discontinued after 200 messages were displayed.
 More may exist.  See ( seism5.err ) for suppressed messages.
***************************************************************************

*** NOTE ***                            CP=    285.740   TIME= 16:32:20
The model data was checked and warning messages were found.
 Please review output or errors file ( seism5.err ) for these warning
 messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   16:32:20  MAY 31, 1996 CP=    285.740
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Static Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
  NUMBER OF MODES TO EXTRACT. . . . . .     1

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1



          ***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

 CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

 TOTAL MASS =   24789.

                          MOM. OF INERTIA          MOM. OF INERTIA
    CENTROID               ABOUT ORIGIN             ABOUT CENTROID

 XC =  0.44150          IXX =   0.1970E+06       IXX =   0.6490E+05
 YC =  0.15716          IYY =   0.1965E+06       IYY =   0.6017E+05
 ZC =   2.3032          IZZ =   0.1300E+05       IZZ =    7554.
                        IXY =    -1505.          IXY =    214.6
                        IYZ =    -8989.          IYZ =   -16.94
                        IZX =  -0.2522E+05       IZX =   -10.91


 *** MASS SUMMARY BY ELEMENT TYPE ***

 TYPE      MASS
    1   1824.11
```

```
    2   982.613
    3   649.245
    4   354.547
    5   2104.91
    6   7186.21
    7   11687.1

Range of element maximum matrix coefficients in global coordinates
Maximum= 1.047821976E+11 at element 2547.
Minimum= 480530912 at element 6464.

  *** ELEMENT MATRIX FORMULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    1    2820  SOLID45       16.460    0.006
    2    1170  SOLID45        6.830    0.006
    3     720  SOLID45        4.230    0.006
    4     270  SOLID45        1.640    0.006
    5    3048  SOLID45       17.820    0.006
    6    3800  SOLID45       22.150    0.006
    7    1936  SOLID45       11.260    0.006
Time at end of element matrix formulation CP= 388.45.

Estimated number of active DOF= 56662.
Maximum wavefront= 2121.

Time at end of matrix triangularization CP= 578.79.

SUBSPACE SIZE OF    5 VECTORS USED FOR CALCULATION OF FIRST    1 EIGENVECTORS.
 MAXIMUM ITERATIONS   =     100
 NUMBER OF EQUATIONS  =   56662
 MAXIMUM WAVEFRONT    =    2121
 ITERATIONS PER SHIFT =       5
 MAXIMUM MODES STORED =       5
 MAXIMUM EIGENVALUE   = 0.10000E+07
 WORK SPACE (MBYTE)   =  17.997

Equation solver maximum pivot= 5.381411247E+11 at node 3291 UX.

Equation solver minimum pivot= 978272.64 at node 18432 UZ.


    *****  ITERATION    1  COMPLETE *****  CP=   10707.240  WALL=     20.8694

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   1    0.84626522E-02    0.00000000E+00     0.28273E-02
   2     186.03986        0.00000000E+00     0.10000E+01
   3     285.73850        0.00000000E+00     0.10000E+01
   4     480.29639        0.00000000E+00     0.10000E+01
   5     587.76674        0.00000000E+00     0.10000E+01

ITERATIONS SINCE LAST SHIFT=      1
TOTAL NUMBER OF ITERATIONS=       1
NUMBER OF MODES CONVERGED=        0
NUMBER OF WORKING VECTORS=        5
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  9815.230
CP TIME SINCE LAST SHIFT=        307.580


    *****  ITERATION    2  COMPLETE *****  CP=   11013.530  WALL=     21.1283

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
   1    0.30704499E-03    0.84626522E-02     0.28236E-02
   2     117.99805        186.03986          0.14858E+01
   3     133.02835        285.73850          0.36137E+01
```

```
   4     171.51396          480.29639          0.68419E+01
   5     232.68312          587.76674          0.53809E+01

 ITERATIONS SINCE LAST SHIFT=      2
 TOTAL NUMBER OF ITERATIONS=       2
 NUMBER OF MODES CONVERGED=        0
 NUMBER OF WORKING VECTORS=        5
 CURRENT SHIFT POINT=           -1.0000
 CP TIME FOR TRIANGULARIZATION=  9815.230
 CP TIME SINCE LAST SHIFT=        613.860


     *****  ITERATION    3  COMPLETE *****  CP=    11321.540  WALL=     21.3878

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
  MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
    1    0.29825175E-03    0.30704499E-03     0.21012E-06

 *** NOTE ***                            CP=  11321.540   TIME= 21:23:16
 NEW SHIFT= 36.8857039.

 *** NOTE ***                            CP=  21459.940   TIME= 02:03:45
 STURM number= 1 should be 1.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   02:03:47  JUN 01, 1996 CP=  21460.230
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Static Analysis With Backfill


  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)


    1      0.29825175E-03


   *** PROBLEM STATISTICS
  ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  56662
  R.M.S. WAVEFRONT SIZE =  1441.5


 *** ANSYS BINARY FILE STATISTICS
  BUFFER SIZE USED=  4096
       71.250 MB WRITTEN ON ELEMENT MATRIX FILE: seism5.emat
       47.250 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism5.esav
       35.000 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism5.full
        0.969 MB WRITTEN ON MODAL MATRIX FILE: seism5.mode

 FINISH SOLUTION PROCESSING


 ***** ROUTINE COMPLETED *****  CP =     21472.270


 PURGE ALL SOLUTION AND POST DATA
 SAVE ALL MODEL DATA

 ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism5.db
  FOR POSSIBLE RESUME FROM THIS POINT


 NUMBER OF WARNING MESSAGES ENCOUNTERED=       1678
 NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0
```

```
***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        28821
MAXIMUM RECORD NUMBER    =          684
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)      =       42.750

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                      HP 9000/7XX            |
|                                                                        |
|       CP TIME      (sec) =      21503.280       TIME  =  02:08:35      |
|       ELAPSED TIME (sec) =      35218.000       DATE  =  06/01/96      |
|                                                                        |
*------------------------------------------------------------------------*
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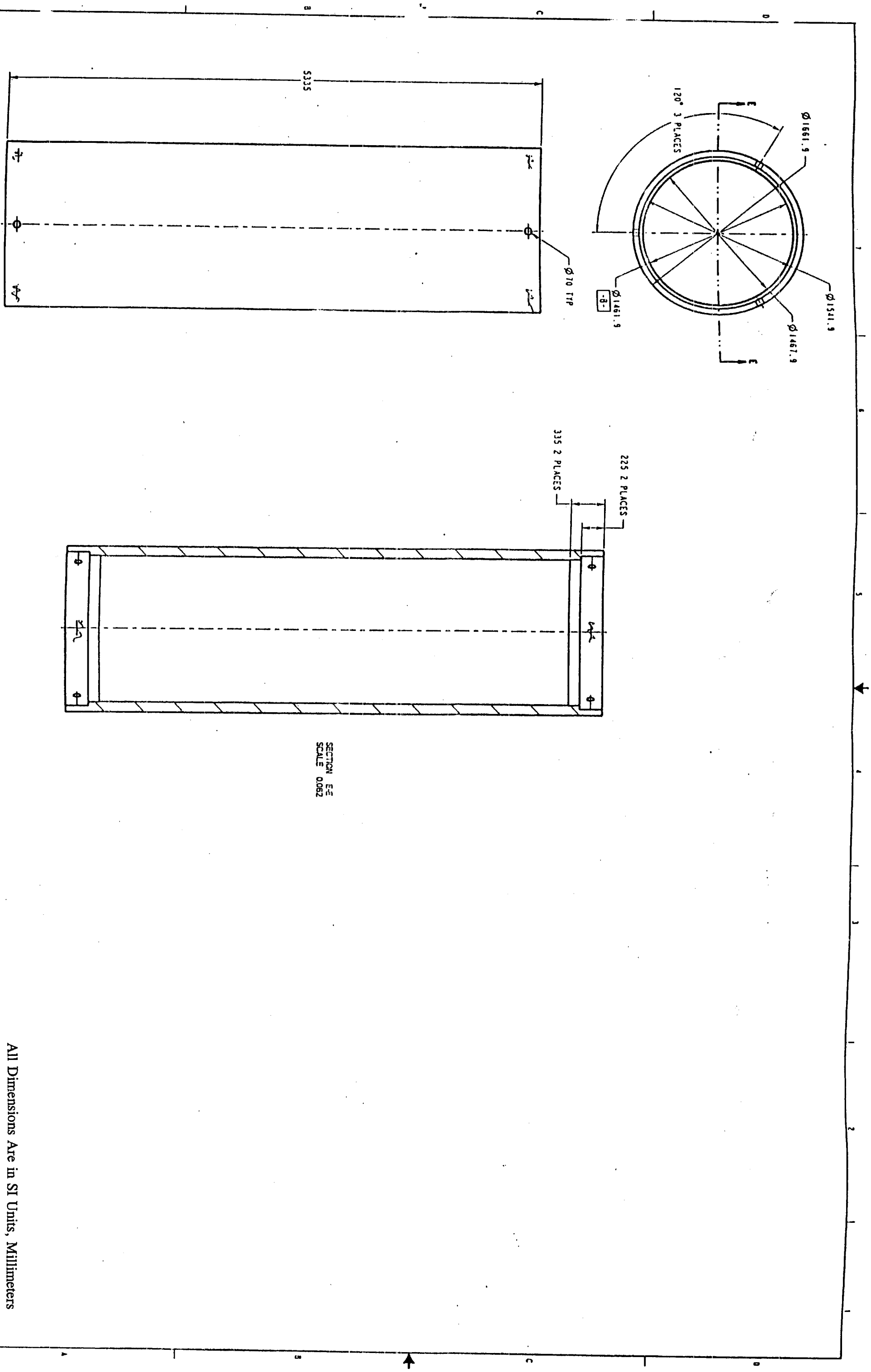
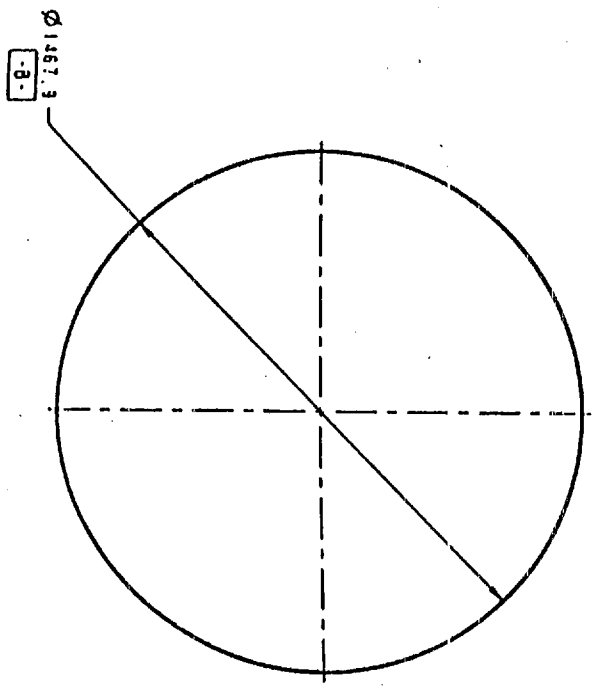
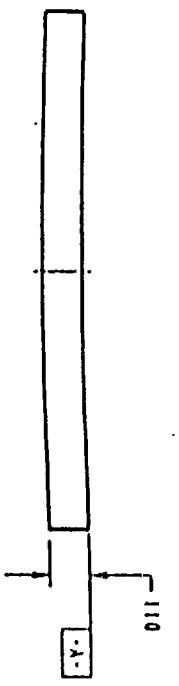


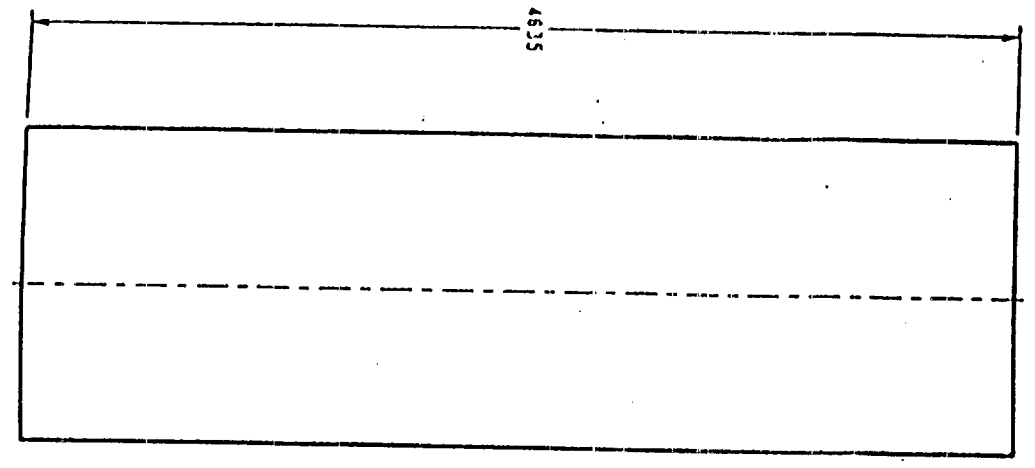
Attachment XXXIX-1. Waste Package Tube Design (21-PWR) Outer Barrier Preliminary Sketch.

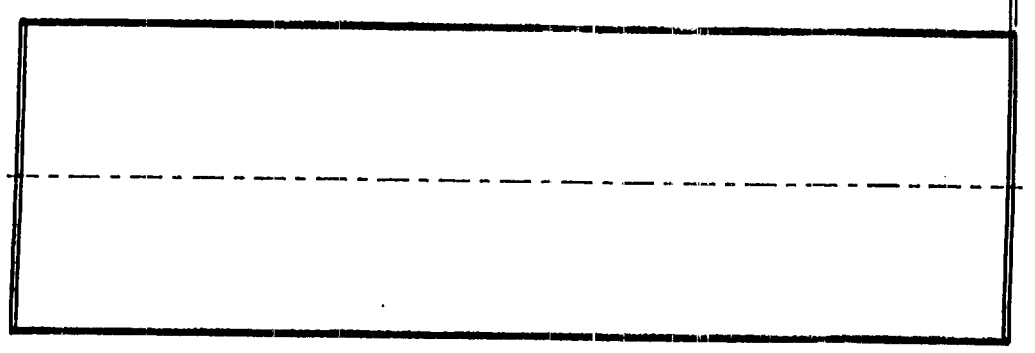




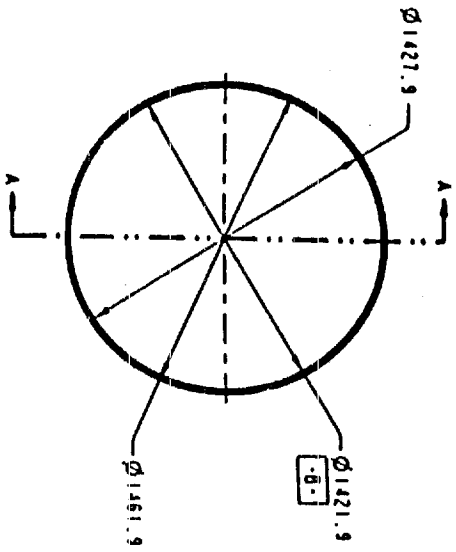
All Dimensions Are in SI Units, Millimeters

Attachment XXXIX-2. Waste Package Tube Design (21-PWR) Outer Barrier Lid Preliminary Sketch.



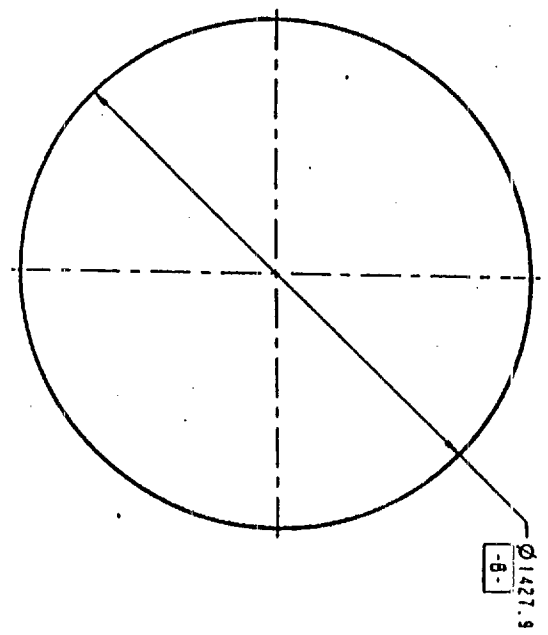


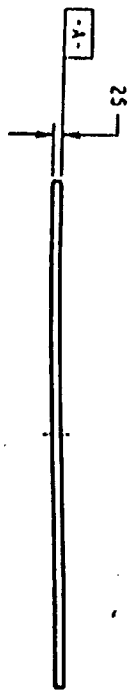
SECTION A-A
SCALE 0.060



All Dimensions Are in SI Units, Millimeters

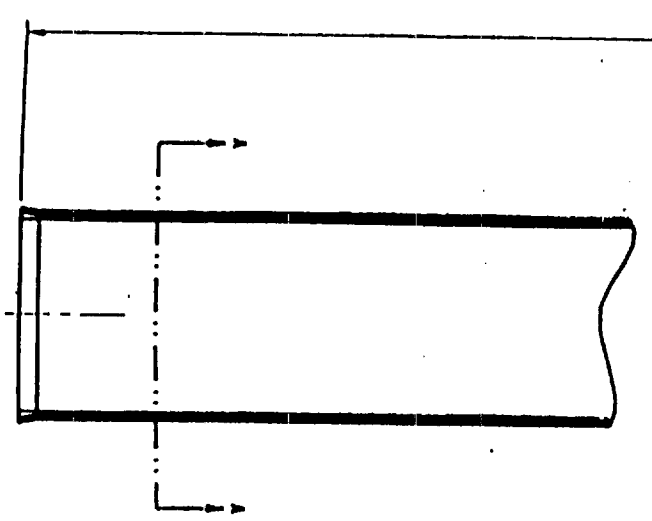
Attachment XXXIX-3. Waste Package Tube Design (21-PWR) Inner Barrier Preliminary Sketch.





All Dimensions Are in SI Units, Millimeters

Attachment XXXIX-4. Waste Package Tube Design (21-PWR) Inner Barrier Lid Preliminary Sketch.



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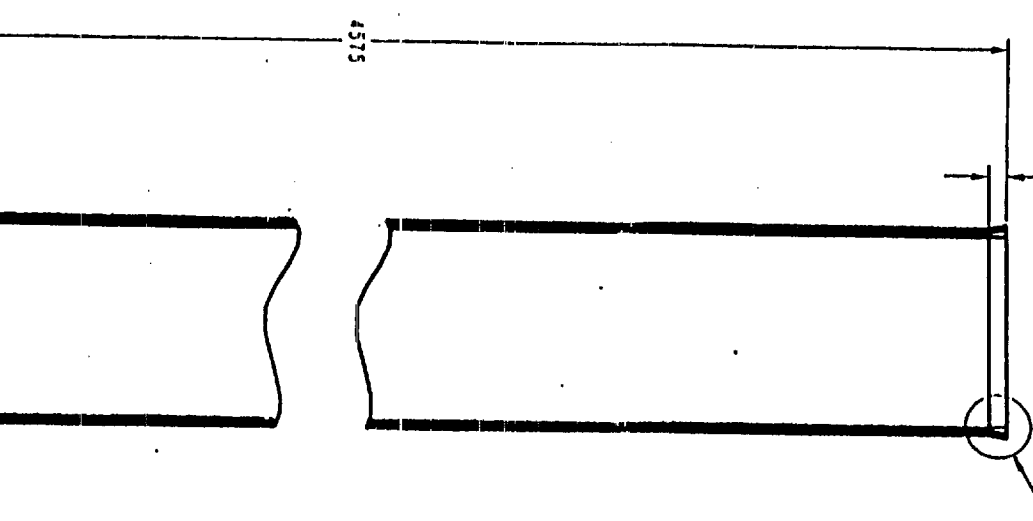
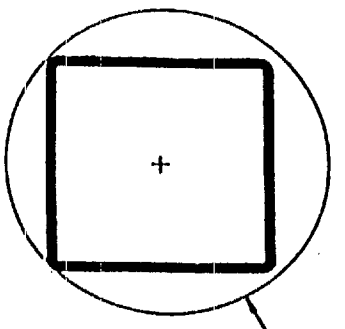
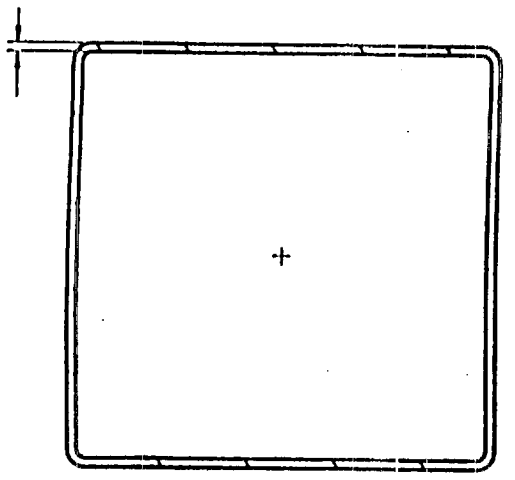


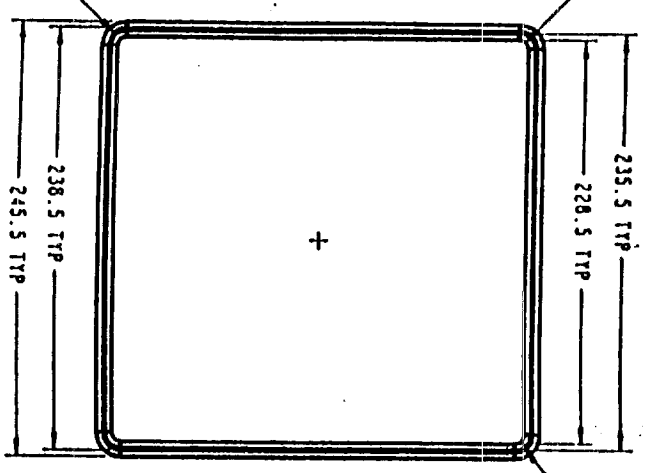
R10 TYP 4 PLACES

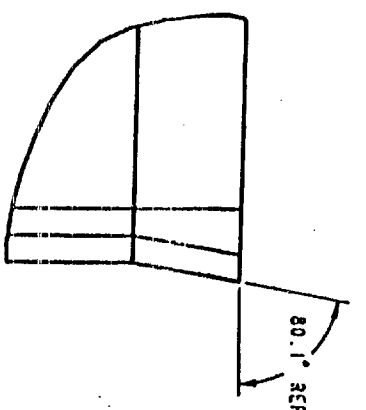


R5 TYP 4 PLACES



DETAIL B
SCALE 0.500

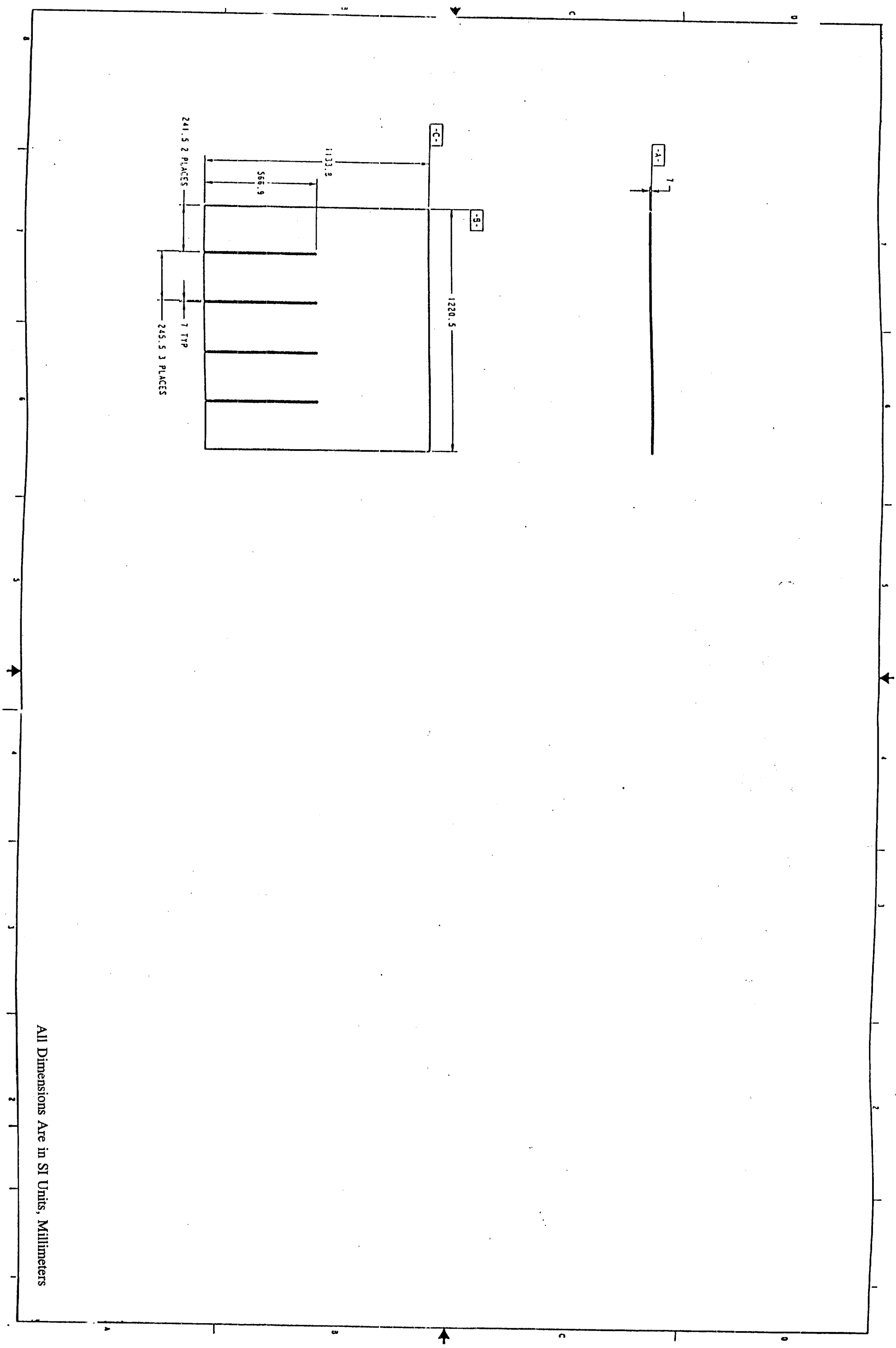




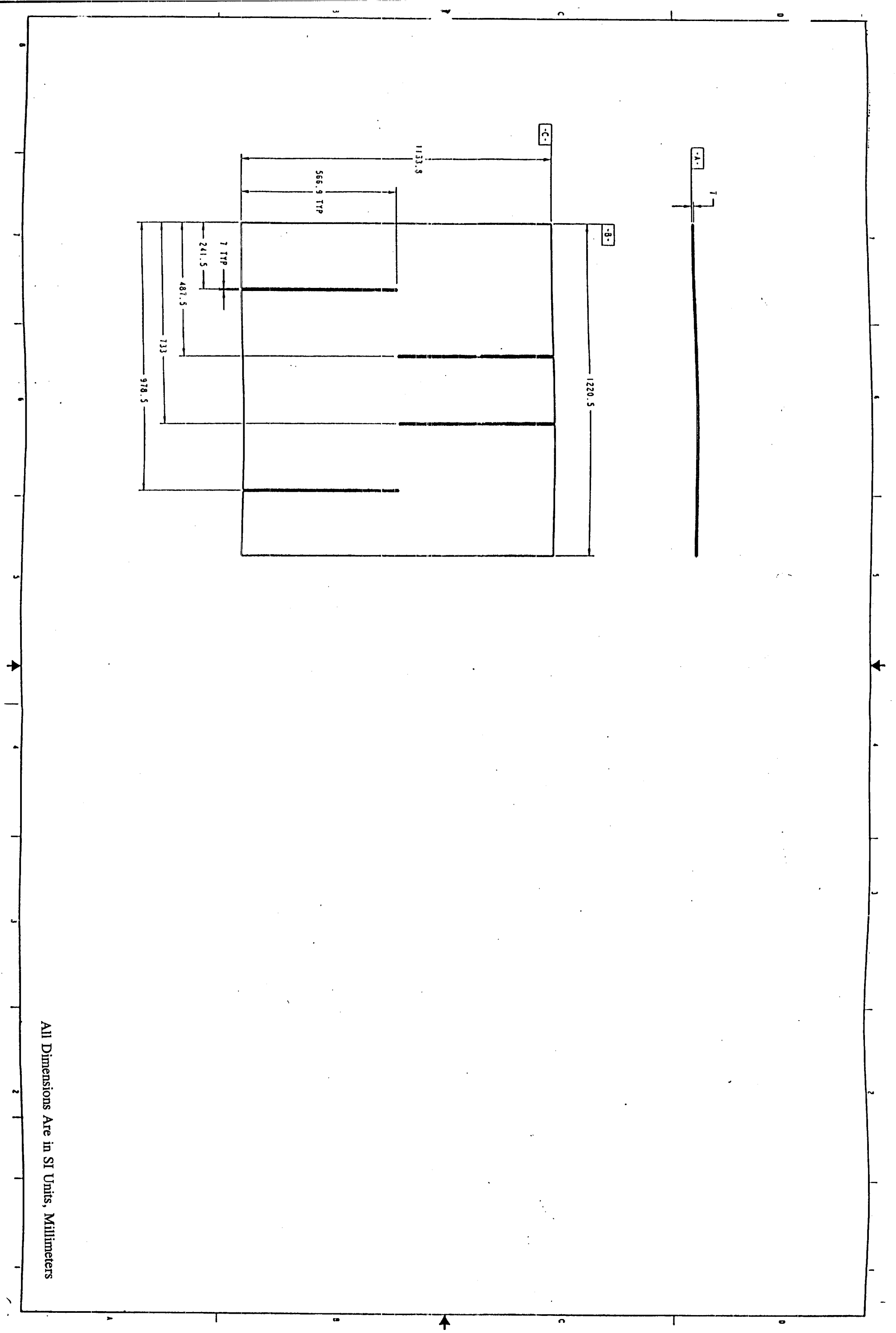
DETAIL C
SCALE 1.500

All Dimensions Are in SI Units, Millimeters

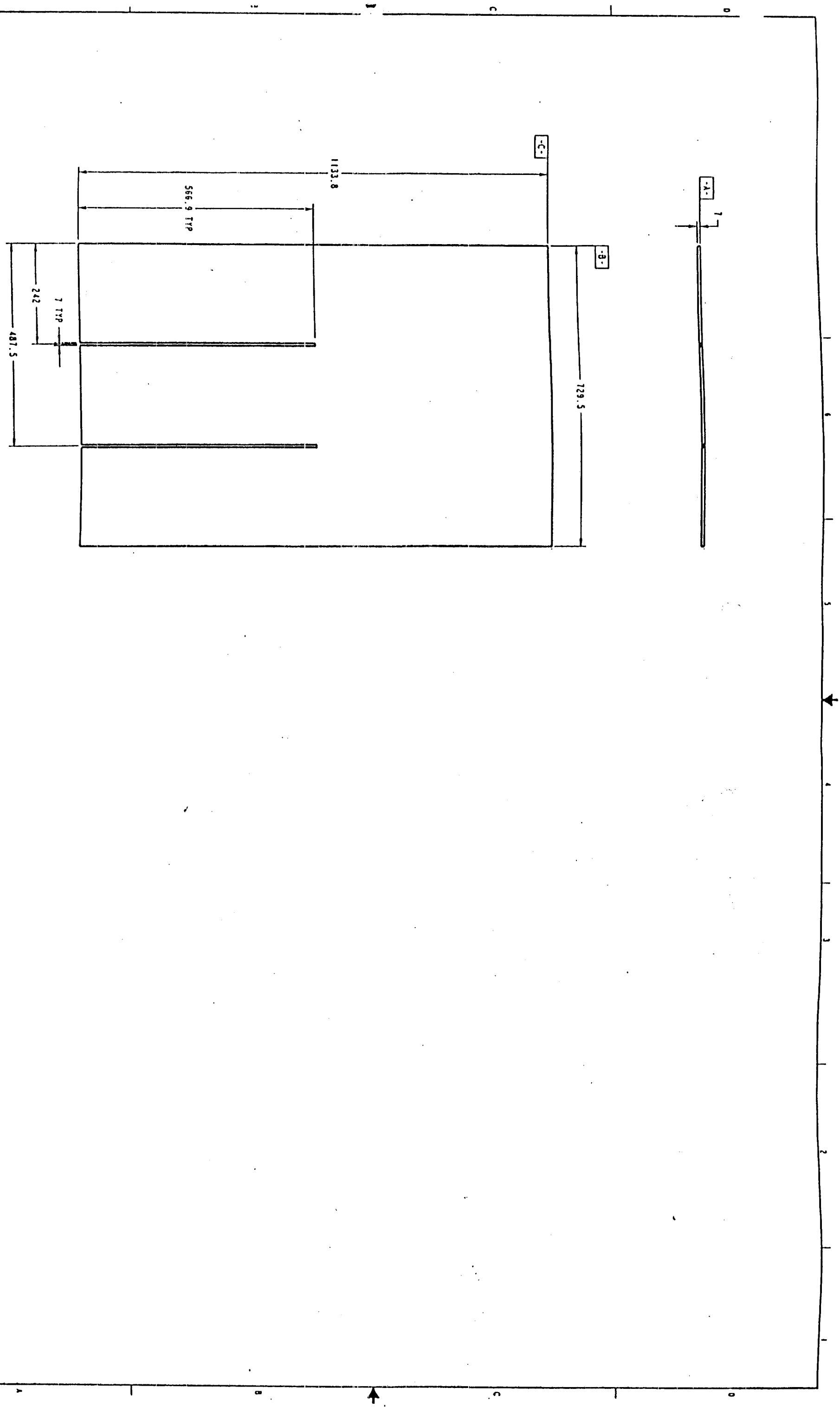
Attachment XXXIX-5. Waste Package Tube Design (21-PWR) Tube Preliminary Sketch.



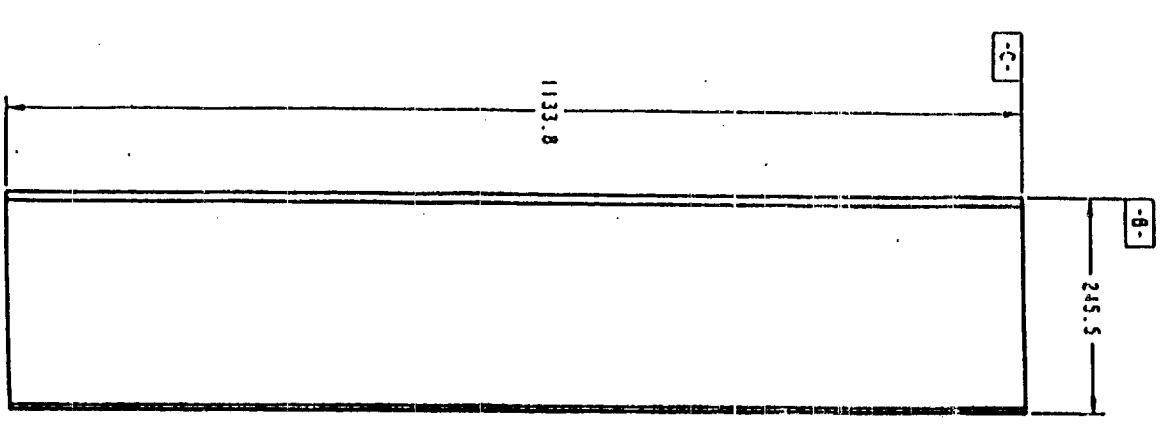
Attachment XXXIX-6. Waste Package Tube Design (21-PWR) A-Plate Preliminary Sketch.

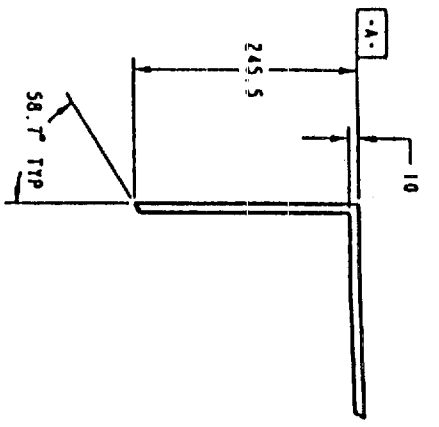


Attachment XXXIX-7. Waste Package Tube Design (21-PWR) B-Plate Preliminary Sketch.



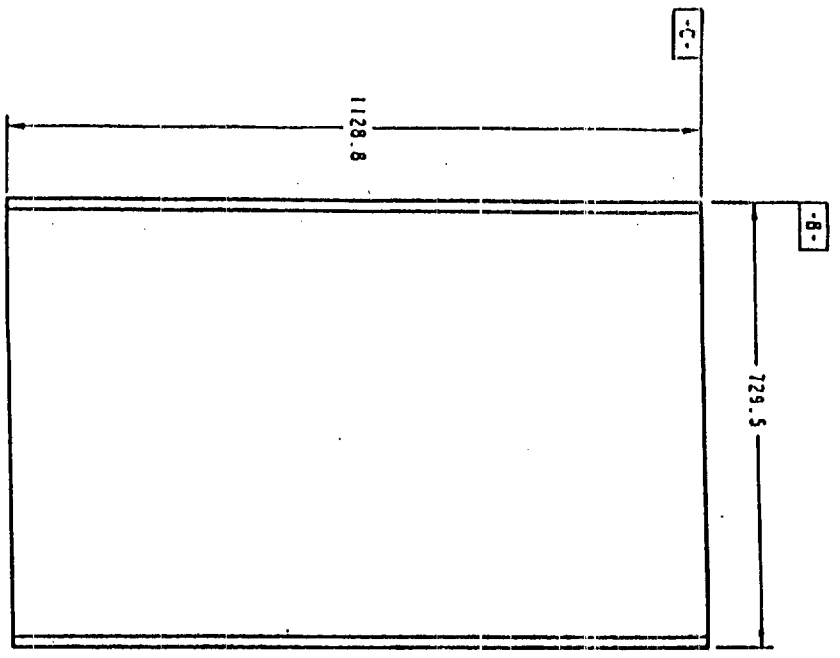
Attachment XXXIX-8. Waste Package Tube Design (21-PWR) C-Plate Preliminary Sketch.

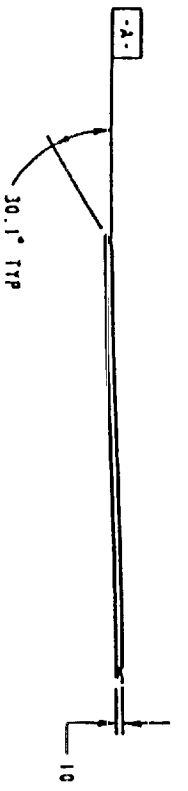




All Dimensions Are in SI Units, Millimeters

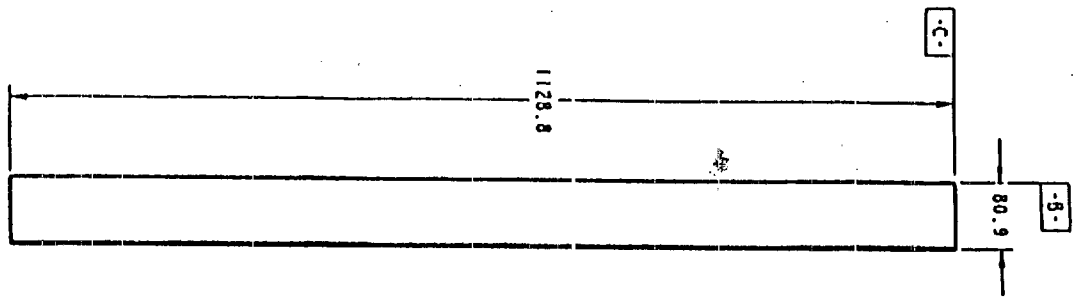
Attachment XXXIX-9. Waste Package Tube Design (21-PWR) Corner Guide Preliminary Sketch.

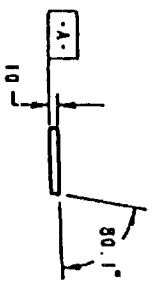




All Dimensions Are in SI Units, Millimeters

Attachment XXXIX-10. Waste Package Tube Design (21-PWR) A-Guide Preliminary Sketch.





All Dimensions Are in SI Units, Millimeters

Attachment XXXIX-11. Waste Package Tube Design (21-PWR) B-Guide Preliminary Sketch.

Inner Barrier Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:30:50 JUN 09, 1996 CP= 112.680
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 8632 OUTSIDE NODE = 8626

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

	SX	SY	SZ	SXY	SYZ	SXZ
	0.9995E+08	0.1013E+09	0.2643E+09	0.1703E+08	0.4177E+08	0.1675E+08
	S1	S2	S3	SINT	SEQV	
	0.2767E+09	0.1074E+09	0.8150E+08	0.1952E+09	0.1836E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.6828E+07	0.1556E+07	0.2991E+08	-0.4558E+07	-0.2046E+07	0.2879E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.6828E+07	-0.1556E+07	-0.2991E+08	0.4558E+07	0.2046E+07	-0.2879E+07
	S1	S2	S3	SINT	SEQV	
I	0.3051E+08	0.8870E+07	-0.1076E+07	0.3158E+08	0.2797E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.1076E+07	-0.8870E+07	-0.3051E+08	0.3158E+08	0.2797E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1068E+09	0.1029E+09	0.2942E+09	0.1247E+08	0.3972E+08	0.1963E+08
C	0.9995E+08	0.1013E+09	0.2643E+09	0.1703E+08	0.4177E+08	0.1675E+08
O	0.9313E+08	0.9979E+08	0.2344E+09	0.2159E+08	0.4382E+08	0.1387E+08
	S1	S2	S3	SINT	SEQV	
I	0.3045E+09	0.1093E+09	0.9011E+08	0.2144E+09	0.2055E+09	
C	0.2767E+09	0.1074E+09	0.8150E+08	0.1952E+09	0.1836E+09	
O	0.2498E+09	0.1055E+09	0.7200E+08	0.1778E+09	0.1637E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.6212E+08	0.3524E+07	0.2316E+09	0.4220E+07	-0.3237E+06	0.7404E+07
C	-0.6211E+08	-0.3523E+07	-0.2316E+09	-0.4222E+07	0.3228E+06	-0.7403E+07
O	0.6211E+08	0.3523E+07	0.2316E+09	0.4224E+07	-0.3219E+06	0.7402E+07
	S1	S2	S3	SINT	SEQV	
I	0.2320E+09	0.6210E+08	0.3218E+07	0.2287E+09	0.2057E+09	
C	-0.3217E+07	-0.6210E+08	-0.2319E+09	0.2287E+09	0.2057E+09	
O	0.2319E+09	0.6210E+08	0.3216E+07	0.2287E+09	0.2057E+09	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1689E+09	0.1064E+09	0.5258E+09	0.1669E+08	0.3940E+08	0.2703E+08
C	0.3784E+08	0.9782E+08	0.3266E+08	0.1281E+08	0.4209E+08	0.9345E+07
O	0.1552E+09	0.1033E+09	0.4660E+09	0.2581E+08	0.4349E+08	0.2127E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.5317E+09	0.1696E+09	0.9979E+08	0.4319E+09	0.4016E+09	0.0000E+00
C	0.1214E+09	0.3524E+08	0.1170E+08	0.1097E+09	0.1000E+09	
O	0.4730E+09	0.1618E+09	0.8979E+08	0.3832E+09	0.3527E+09	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:30:52 JUN 09, 1996 CP= 113.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 4355 OUTSIDE NODE = 4293

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.7309E+08	0.6979E+08	0.2110E+09	0.1562E+08	0.5319E+08	0.1043E+08
S1	S2	S3	SINT	SEQV	
0.2302E+09	0.7694E+08	0.4673E+08	0.1834E+09	0.1704E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1321E+07	-0.2072E+07	-0.6872E+06	-0.4187E+07	0.4477E+07	0.1264E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1321E+07	0.2072E+07	0.6872E+06	0.4187E+07	-0.4477E+07	-0.1264E+07
	S1	S2	S3	SINT	SEQV	
I	0.3993E+07	0.2245E+06	-0.8299E+07	0.1229E+08	0.1091E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.8299E+07	-0.2245E+06	-0.3993E+07	0.1229E+08	0.1091E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.7177E+08	0.6772E+08	0.2103E+09	0.1143E+08	0.5767E+08	0.1169E+08
C	0.7309E+08	0.6979E+08	0.2110E+09	0.1562E+08	0.5319E+08	0.1043E+08
O	0.7441E+08	0.7186E+08	0.2117E+09	0.1981E+08	0.4871E+08	0.9162E+07
	S1	S2	S3	SINT	SEQV	
I	0.2321E+09	0.7227E+08	0.4543E+08	0.1866E+09	0.1748E+09	
C	0.2302E+09	0.7694E+08	0.4673E+08	0.1834E+09	0.1704E+09	
O	0.2284E+09	0.8284E+08	0.4672E+08	0.1816E+09	0.1666E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.5765E+06	0.3036E+05	0.5409E+07	0.2793E+07	0.2165E+08	0.4107E+07
C	-0.5771E+06	-0.3126E+05	-0.5409E+07	-0.2795E+07	-0.2165E+08	-0.4107E+07
O	0.5777E+06	0.3216E+05	0.5409E+07	0.2796E+07	0.2165E+08	0.4106E+07
	S1	S2	S3	SINT	SEQV	
I	0.2551E+08	-0.3769E+06	-0.1912E+08	0.4463E+08	0.3882E+08	
C	0.1912E+08	0.3768E+06	-0.2551E+08	0.4463E+08	0.3881E+08	
O	0.2551E+08	-0.3767E+06	-0.1911E+08	0.4462E+08	0.3881E+08	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.7235E+08	0.6775E+08	0.2157E+09	0.1423E+08	0.7932E+08	0.1580E+08
C	0.7251E+08	0.6976E+08	0.2056E+09	0.1282E+08	0.3154E+08	0.6320E+07
O	0.7499E+08	0.7190E+08	0.2171E+09	0.2260E+08	0.7036E+08	0.1327E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.2524E+09	0.7127E+08	0.3208E+08	0.2204E+09	0.2036E+09	0.0000E+00
C	0.2131E+09	0.7941E+08	0.5533E+08	0.1578E+09	0.1472E+09	
O	0.2481E+09	0.7946E+08	0.3641E+08	0.2117E+09	0.1938E+09	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:30:54 JUN 09, 1996 CP= 114.860
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 3878 OUTSIDE NODE = 3830

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

	SX	SY	SZ	SXY	SYZ	SXZ
	0.2256E+07	0.2365E+08	0.1623E+07	0.2121E+07	0.3887E+07	0.1879E+06
	S1	S2	S3	SINT	SEQV	
	0.2452E+08	0.2080E+07	0.9309E+06	0.2359E+08	0.2303E+08	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1647E+06	0.1157E+07	0.2896E+06	0.1099E+06	-0.8958E+05	0.1066E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1647E+06	-0.1157E+07	-0.2896E+06	-0.1099E+06	0.8958E+05	-0.1066E+05
	S1	S2	S3	SINT	SEQV	
I	0.1178E+07	0.2841E+06	0.1495E+06	0.1028E+07	0.9683E+06	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	-0.1495E+06	-0.2841E+06	-0.1178E+07	0.1028E+07	0.9683E+06	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2421E+07	0.2481E+08	0.1913E+07	0.2231E+07	0.3797E+07	0.1986E+06
C	0.2256E+07	0.2365E+08	0.1623E+07	0.2121E+07	0.3887E+07	0.1879E+06
O	0.2092E+07	0.2249E+08	0.1333E+07	0.2011E+07	0.3976E+07	0.1773E+06
	S1	S2	S3	SINT	SEQV	
I	0.2563E+08	0.2233E+07	0.1272E+07	0.2436E+08	0.2390E+08	
C	0.2452E+08	0.2080E+07	0.9309E+06	0.2359E+08	0.2303E+08	
O	0.2340E+08	0.1928E+07	0.5850E+06	0.2282E+08	0.2218E+08	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1756E+05	0.4874E+05	0.4688E+05	753.0	-6755.	-1030.
C	-0.1749E+05	-0.4824E+05	-0.4675E+05	-705.3	6717.	1035.
O	0.1742E+05	0.4774E+05	0.4662E+05	657.5	-6678.	-1040.
	S1	S2	S3	SINT	SEQV	
I	0.5467E+05	0.4099E+05	0.1751E+05	0.3716E+05	0.3255E+05	
C	-0.1744E+05	-0.4074E+05	-0.5429E+05	0.3685E+05	0.3228E+05	
O	0.5392E+05	0.4048E+05	0.1737E+05	0.3655E+05	0.3202E+05	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2438E+07	0.2486E+08	0.1960E+07	0.2232E+07	0.3790E+07	0.1976E+06
C	0.2239E+07	0.2360E+08	0.1576E+07	0.2120E+07	0.3894E+07	0.1890E+06
O	0.2109E+07	0.2254E+08	0.1380E+07	0.2012E+07	0.3970E+07	0.1762E+06
	S1	S2	S3	SINT	SEQV	TEMP
I	0.2568E+08	0.2252E+07	0.1320E+07	0.2436E+08	0.2391E+08	0.0000E+00
C	0.2447E+08	0.2062E+07	0.8827E+06	0.2359E+08	0.2302E+08	
O	0.2345E+08	0.1946E+07	0.6332E+06	0.2282E+08	0.2219E+08	0.0000E+00

Basket Tubes and Guides Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:30:52 JUN 09, 1996 CP= 113.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 4355 OUTSIDE NODE = 4293

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.7309E+08	0.6979E+08	0.2110E+09	0.1562E+08	0.5319E+08	0.1043E+08
S1	S2	S3	SINT	SEQV	
0.2302E+09	0.7694E+08	0.4673E+08	0.1834E+09	0.1704E+09	

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	-0.1321E+07	-0.2072E+07	-0.6872E+06	-0.4187E+07	0.4477E+07	0.1264E+07
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	0.1321E+07	0.2072E+07	0.6872E+06	0.4187E+07	-0.4477E+07	-0.1264E+07
	S1	S2	S3	SINT	SEQV	
I	0.3993E+07	0.2245E+06	-0.8299E+07	0.1229E+08	0.1091E+08	
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	
O	0.8299E+07	-0.2245E+06	-0.3993E+07	0.1229E+08	0.1091E+08	

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.7177E+08	0.6772E+08	0.2103E+09	0.1143E+08	0.5767E+08	0.1169E+08
C	0.7309E+08	0.6979E+08	0.2110E+09	0.1562E+08	0.5319E+08	0.1043E+08
O	0.7441E+08	0.7186E+08	0.2117E+09	0.1981E+08	0.4871E+08	0.9162E+07
	S1	S2	S3	SINT	SEQV	
I	0.2321E+09	0.7227E+08	0.4543E+08	0.1866E+09	0.1748E+09	
C	0.2302E+09	0.7694E+08	0.4673E+08	0.1834E+09	0.1704E+09	
O	0.2284E+09	0.8284E+08	0.4672E+08	0.1816E+09	0.1666E+09	

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.5765E+06	0.3036E+05	0.5409E+07	0.2793E+07	0.2165E+08	0.4107E+07
C	-0.5771E+06	-0.3126E+05	-0.5409E+07	-0.2795E+07	-0.2165E+08	-0.4107E+07
O	0.5777E+06	0.3216E+05	0.5409E+07	0.2796E+07	0.2165E+08	0.4106E+07
	S1	S2	S3	SINT	SEQV	
I	0.2551E+08	-0.3769E+06	-0.1912E+08	0.4463E+08	0.3882E+08	
C	0.1912E+08	0.3768E+06	-0.2551E+08	0.4463E+08	0.3881E+08	
O	0.2551E+08	-0.3767E+06	-0.1911E+08	0.4462E+08	0.3881E+08	

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.7235E+08	0.6775E+08	0.2157E+09	0.1423E+08	0.7932E+08	0.1580E+08
C	0.7251E+08	0.6976E+08	0.2056E+09	0.1282E+08	0.3154E+08	0.6320E+07
O	0.7499E+08	0.7190E+08	0.2171E+09	0.2260E+08	0.7036E+08	0.1327E+08
	S1	S2	S3	SINT	SEQV	TEMP
I	0.2524E+09	0.7127E+08	0.3208E+08	0.2204E+09	0.2036E+09	0.0000E+00
C	0.2131E+09	0.7941E+08	0.5533E+08	0.1578E+09	0.1472E+09	
O	0.2481E+09	0.7946E+08	0.3641E+08	0.2117E+09	0.1938E+09	0.0000E+00

Criticality Control Plates Linearized Stresses at Location of Peak Stress

PRINT LINEARIZED STRESS THROUGH A SECTION DEFINED BY LPATH COMMAND. DSYS= 0
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:30:54 JUN 09, 1996 CP= 114.860
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 LINEARIZED STRESS LISTING *****
INSIDE NODE = 3878 OUTSIDE NODE = 3830

CALCULATED LOAD CASE= 0

THE FOLLOWING X,Y,Z STRESSES ARE IN GLOBAL COORDINATES.

** MEMBRANE **

SX	SY	SZ	SXY	SYZ	SXZ
0.2256E+07	0.2365E+08	0.1623E+07	0.2121E+07	0.3887E+07	0.1879E+06

S1	S2	S3	SINT	SEQV
0.2452E+08	0.2080E+07	0.9309E+06	0.2359E+08	0.2303E+08

** BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1647E+06	0.1157E+07	0.2896E+06	0.1099E+06	-0.8958E+05	0.1066E+05
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1647E+06	-0.1157E+07	-0.2896E+06	-0.1099E+06	0.8958E+05	-0.1066E+05

	S1	S2	S3	SINT	SEQV
I	0.1178E+07	0.2841E+06	0.1495E+06	0.1028E+07	0.9683E+06
C	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
O	-0.1495E+06	-0.2841E+06	-0.1178E+07	0.1028E+07	0.9683E+06

** MEMBRANE PLUS BENDING ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2421E+07	0.2481E+08	0.1913E+07	0.2231E+07	0.3797E+07	0.1986E+06
C	0.2256E+07	0.2365E+08	0.1623E+07	0.2121E+07	0.3887E+07	0.1879E+06
O	0.2092E+07	0.2249E+08	0.1333E+07	0.2011E+07	0.3976E+07	0.1773E+06

	S1	S2	S3	SINT	SEQV
I	0.2563E+08	0.2233E+07	0.1272E+07	0.2436E+08	0.2390E+08
C	0.2452E+08	0.2080E+07	0.9309E+06	0.2359E+08	0.2303E+08
O	0.2340E+08	0.1928E+07	0.5850E+06	0.2282E+08	0.2218E+08

** PEAK ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.1756E+05	0.4874E+05	0.4688E+05	753.0	-6755.	-1030.
C	-0.1749E+05	-0.4824E+05	-0.4675E+05	-705.3	6717.	1035.
O	0.1742E+05	0.4774E+05	0.4662E+05	657.5	-6678.	-1040.

	S1	S2	S3	SINT	SEQV
I	0.5467E+05	0.4099E+05	0.1751E+05	0.3716E+05	0.3255E+05
C	-0.1744E+05	-0.4074E+05	-0.5429E+05	0.3685E+05	0.3228E+05
O	0.5392E+05	0.4048E+05	0.1737E+05	0.3655E+05	0.3202E+05

** TOTAL ** I=INSIDE C=CENTER O=OUTSIDE

	SX	SY	SZ	SXY	SYZ	SXZ
I	0.2438E+07	0.2486E+08	0.1960E+07	0.2232E+07	0.3790E+07	0.1976E+06
C	0.2239E+07	0.2360E+08	0.1576E+07	0.2120E+07	0.3894E+07	0.1890E+06
O	0.2109E+07	0.2254E+08	0.1380E+07	0.2012E+07	0.3970E+07	0.1762E+06

	S1	S2	S3	SINT	SEQV	TEMP
I	0.2568E+08	0.2252E+07	0.1320E+07	0.2436E+08	0.2391E+08	0.0000E+00
C	0.2447E+08	0.2062E+07	0.8827E+06	0.2359E+08	0.2302E+08	
O	0.2345E+08	0.1946E+07	0.6332E+06	0.2282E+08	0.2219E+08	0.0000E+00

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PRESS <CR> OR <ENTER> TO CONTINUE


       ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = seism4
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.240   TIME= 20:53:34
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=seism4    20:53:34  JUN 08, 1996 CP=      0.250

    1 /com,*********************************************************************
    2 /com,*********************************************************************
    3 /com,*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
    4 /com,*****  Degree of Degradation in Outer Barrier: 100%                   *****
    5 /com,*****  Degree of Degradation in Inner Barrier:  90%                   *****
    6 /com,*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
    7 /com,*****                                             Guides 50%          *****
    8 /com,*****                                             SS-B Plates 50%     *****
    9 /com,*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
   10 /com,*****  Quarter Symmetry Mode.                                         *****
   11 /com,*********************************************************************
   12 /com,*********************************************************************
   13 /com,*********************************************************************
   14 /config,nvpag,512
   15 /units,si
   16 /prep7
   17 /title, 21 PWR Tube Seismic Analysis With Backfill
   18 /vcon,,0
   19 /com, Define Parameters
   20 ibir=0.71095            ! Inner Barrier Inner Radius (DIA = 1.4219 m)
   21 obir=0.71295            ! Outer Barrier Inner Radius (DIA = 1.4619 m)
   22 obsr=0.77095            ! Outer Barrier Skirt Radius (DIA = 1.5419 m)
   23 obor=0.78095            ! Outer Barrier Outer Radius (DIA = 1.6619 m)
   24 ts1=.0035                ! SS-B Plate Thickness
   25 ts2=.005                ! CS Tube Thickness
   26 ts3=.005                ! Corner Guide Thickness
   27 ts4=.005                ! End Guide Thickness
   28 egih=0.0855             ! End Guide Fin Inner Height(0.0809+0.005-2.5*tan10)
   29 pie=3.1415926           ! Pi
   30 ang1=30*pie/180         ! Angle on end of end guide
   31 ang2=80*pie/180         ! Angle on end of end guide fin
   32 ang3=58*pie/180         ! Angle on end of corner guide
   33 tw=0.2285               ! Tube Inner Side Width
   34 pos1=tw/2               ! Dimension to Keypoint Position 1
   35 pos2=pos1+ts2           ! Dimension to Keypoint Position 2
   36 pos3=pos2+ts1           ! Dimension to Keypoint Position 3
   37 pos4=pos3+ts2           ! Dimension to Keypoint Position 4
   38 pos5=pos4+tw            ! Dimension to Keypoint Position 5
   39 pos6=pos5+ts2           ! Dimension to Keypoint Position 6
   40 pos7=pos6+ts1           ! Dimension to Keypoint Position 7
   41 pos8=pos7+ts2           ! Dimension to Keypoint Position 8
   42 pos9=pos8+tw            ! Dimension to Keypoint Position 9
   43 pos10=pos9+ts2          ! Dimension to Keypoint Position 10
   44 pos11=pos10+ts4         ! Dimension to Keypoint Position 11
   45 posg=pos6+ts3           ! Dimension to Keypoint on Corner Guide
   46 posei=pos11+egih        ! Dimension to Keypoint on End Guide Fin Inner
   47 poseo=posei-(ts4/tan(ang2)) ! Dimension to Keypoint on End Guide Fin Outer
   48 posen=pos2+ts1/2-ts4/2  ! Dimension to Keypoint on End Guide Near Side
   49 posef=pos2+ts1/2+ts4/2  ! Dimension to Keypoint on End Guide Far Side
   50 poseg=pos6-(ts4/tan(ang1)) ! Dimension to Keypoint on End Guide Side
```

```
poscg=pos10-(ts3/tan(ang3)) ! Dimension to Keypoint on Corner Guide Side
bkht=4.575/2                ! Basket Height (Half Height)
ibht=bkht+0.01               ! inner barrier cavity height
!bgh=ibht-bkht              ! Basket Gap Height
iblt=0.01                   ! inner lid height
elev1=ibht+iblt             ! Elevation of Top of Inner Barrier
ltlgh=0.030                 ! Lid to Lid Gap Height
elev2=elev1+ltlgh           ! Elevation of Bottom of Upper Outer Barrier Lid
oblt=0.06                   ! outer lid height
elev3=elev2+oblt            ! Elevation of Top of Upper Outer Barrier Lid
stht=0.225                  ! skirt height
elev4=elev3+stht            ! Elevation of Top of Waste Package
elev5=-(iblt+oblt)          ! Elevation of Bottom of Lower Outer Barrier Lid
elev6=elev5-stht            ! Elevation of Bottom of Waste Package
/com, Line Divisions
shd=1               ! Skirt Height Divisions
obld=1              ! Outer Barrier Lid Divisions
gd=2                ! Gap Divisions
ibld=2              ! Inner Barrier Lid Divisions
bd=15               ! Basket Divisions
htwd=4              ! Half Tube Width Divisions
twd=4               ! Tube Width Divisions
thd=4               ! Tube Height Divisions
egfd=4              ! End Guide Fin Divisions
ptd=2               ! Plate Thickness Divisions
ttd=1               ! Tube Thickness Divisions
a1d=4               ! Arc 1 Divisions
a2d=4               ! Arc 2 Divisions
a3d=4               ! Arc 3 Divisions
a4d=4               ! Arc 4 Divisions
a5d=4               ! Arc 5 Divisions
a6d=4               ! Arc 6 Divisions
a7d=4               ! Arc 7 Divisions
a8d=4               ! Arc 8 Divisions
a9d=4               ! Arc 9 Divisions
ibtd=2              ! Inner Barrier Thickness Divisions
obitd=2             ! Outer Barrier Inner Thickness Divisions
std=2               ! Skirt Thickness Divisions
/com, Define Element Properties
et,1,solid45      ! Carbon Steel Tube
et,2,solid45      ! Stainless Steel - Boron Plate
et,3,solid45      ! Carbon Steel End Guide
et,4,solid45      ! Carbon Steel Corner Guide
et,5,solid45      ! Alloy 625 Inner Barrier
et,6,solid45      ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!et,6,solid45      ! A 516 Carbon Steel Outer Barrier
!et,7,solid45      ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
/com, ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
/com, Room Temperature Properties of Materials
mp,ex,1,206e9       ! A516 Carbon Steel Tube
mp,ex,2,195e9       ! 316B6A Stainless Steel - Boron Plate (316L Properties)
mp,ex,3,206e9       ! A516 Carbon Steel End Guide
mp,ex,4,206e9       ! A516 Carbon Steel Corner Guide
mp,ex,5,208e9       ! Alloy 625 Inner Barrier
mp,ex,6,208e9       ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!mp,ex,6,206e9       ! A516 Carbon Steel Outer Barrier
!mp,ex,7,206e9       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,nuxy,1,0.3       ! A516 Carbon Steel Tube
mp,nuxy,2,0.298     ! 316B6A Stainless Steel - Boron Plate (316 Properties)
mp,nuxy,3,0.3       ! A516 Carbon Steel End Guide
mp,nuxy,4,0.3       ! A516 Carbon Steel Corner Guide
mp,nuxy,5,0.278     ! Alloy 625 Inner Barrier
mp,nuxy,6,0.278     ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
!mp,nuxy,6,0.3       ! A516 Carbon Steel Outer Barrier
!mp,nuxy,7,0.3       ! A516 Carbon Steel Outer Barrier w/Backfill Weight
mp,dens,1,8131      ! A516 Carbon Steel Tube
mp,dens,2,100452.2  ! 316B6A Stainless Steel - Boron Plate (Adjusted to include tube, degraded plate, and SNF mas
mp,dens,3,21221.91     ! A516 Carbon Steel End Guide
mp,dens,4,21221.91     ! A516 Carbon Steel Corner Guide
mp,dens,5,8442      ! Alloy 625 Inner Barrier
```

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121 mp,dens,6,1420770   ! Alloy 625 Inner Barrier (Upper w/Backfill Weight)
122 !mp,dens,6,8131     ! A516 Carbon Steel Outer Barrier
123 !mp,mu,7,0.57       ! Coefficient of Friction (Steel on Steel Assumed)
124 !tb,biso,1
125 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Tubes
126 !tb,biso,2
127 !tbdata,,172e6,0.7767e9 ! 316L Stainless Steel
128 !tb,biso,3
129 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel End Guide
130 !tb,biso,4
131 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Corner Guide
132 !tb,biso,5
133 !tbdata,,379e6,1.271e9  ! Alloy 625
134 !tb,biso,6
135 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier
136 !tb,biso,7
137 !tbdata,,260e6,1.078e9  ! A 516 Carbon Steel Outer Barrier w/Backfill Weight
138 /com
139 /com, Define keypoints in the basket assembly
140 csys,0
141 k,1,0,0
142 k,2,pos1,0
143 k,3,pos2,0
144 k,4,pos3,0
145 k,5,pos4,0
146 k,6,pos5,0
147 k,7,pos6,0
148 k,8,pos7,0
149 k,9,pos8,0
150 k,10,pos9,0
151 k,11,pos10,0
152 k,12,pos11,0
153 k,13,pos1,pos1
154 k,14,pos4,pos1
155 k,15,pos5,pos1
156 k,16,pos8,pos1
157 k,17,pos9,pos1
158 k,18,pos2,pos2
159 k,19,pos3,pos2
160 k,20,pos6,pos2
161 k,21,pos7,pos2
162 k,22,pos10,pos2
163 k,23,pos11,posen
164 !k,24,posei,posen
165 csys,1
166 k,24,ibir,(180/pie)*atan(posen/posei)
167 csys,0
168 k,25,pos3,pos3
169 k,26,pos6,pos3
170 k,27,pos7,pos3
171 k,28,pos10,pos3
172 k,29,pos11,posef
173 !k,30,poseo,posef
174 csys,1
175 k,30,ibir,(180/pie)*atan(posef/poseo)
176 csys,0
177 k,31,pos4,pos4
178 k,32,pos5,pos4
179 k,33,pos8,pos4
180 k,34,pos9,pos4
181 k,35,pos5,pos5
182 k,36,pos8,pos5
183 k,37,pos9,pos5
184 !k,38,pos11,poseg
185 csys,1
186 k,38,ibir,(180/pie)*atan(poseg/pos11)
187 csys,0
188 k,39,pos6,pos6
189 k,40,pos7,pos6
190 !k,41,pos10,pos6
```

```
191 csys,1
192 k,41,ibir,(180/pie)*atan(pos6/pos10)
193 csys,0
194 k,42,posg,posg
195 !k,43,poscg,posg
196 csys,1
197 k,43,ibir,(180/pie)*atan(posg/poscg)
198 k,44,ibir,0
199 k,45,ibir,45
200 k,46,obir,0
201 k,47,obir,(180/pie)*atan(posen/posei)
202 k,48,obir,(180/pie)*atan(posef/poseo)
203 k,49,obir,(180/pie)*atan(poseg/pos11)
204 k,50,obir,(180/pie)*atan(pos6/pos10)
205 k,51,obir,(180/pie)*atan(posg/poscg)
206 k,52,obir,45
207 k,53,obsr,0
208 k,54,obsr,(180/pie)*atan(posen/posei)
209 k,55,obsr,(180/pie)*atan(posef/poseo)
210 k,56,obsr,(180/pie)*atan(poseg/pos11)
211 k,57,obsr,(180/pie)*atan(pos6/pos10)
212 k,58,obsr,(180/pie)*atan(posg/poscg)
213 k,59,obsr,45
214 k,60,obor,0
215 k,61,obor,(180/pie)*atan(posen/posei)
216 k,62,obor,(180/pie)*atan(posef/poseo)
217 k,63,obor,(180/pie)*atan(poseg/pos11)
218 k,64,obor,(180/pie)*atan(pos6/pos'0)
219 k,65,obor,(180/pie)*atan(posg/poscg)
220 k,66,obor,45
221 local,11,0,0,0,0,45,0,0,
222 ksymm,y,all,,,0,0,0
223 nummrg,kp
224 csys,0
225 ksymm,y,all,,,0,0,0
226 nummrg,kp
227 kdel,2,12,1
228 k,1001,0,0,bkht
229 l,1,1001              ! Line 1 for VDRAG of Basket
230 lesize,all,,,bd,.2,0
231 k,2001,0,0,ibht
232 l,1001,2001          ! Line 2 for VDRAG of Basket to Inner Barrier Lid Gap
233 lesize,all,,,gd,1,0
234 k,3001,0,0,elev1
235 l,2001,3001          ! Line 3 for VDRAG of Inner Barrier Upper Lid
236 lesize,all,,,ibld,1,0
237 k,4001,0,0,elev2
238 l,3001,4001          ! Line 4 for VDRAG of Lid to Lid Gap
239 lesize,all,,,gd,1,0
240 k,5001,0,0,elev3
241 l,4001,5001          ! Line 5 for VDRAG of Outer Barrier Upper Lid
242 lesize,all,,,obld,1,0
243 k,6001,0,0,elev4
244 l,5001,6001          ! Line 6 for VDRAG of Upper Skirt
245 lesize,all,,,shd,1,0
246 k,7001,0,0,-iblt
247 l,1,7001              ! Line 7 for VDRAG of IB Lower Lid
248 lesize,all,,,ibld,1,0
249 k,8001,0,0,elev5
250 l,7001,8001          ! Line 8 for VDRAG of OB Lower Lid
251 lesize,all,,,obld,1,0
252 k,9001,0,0,elev6
253 l,8001,9001          ! Line 9 for VDRAG of Lower Skirt
254 lesize,all,,,shd,1,0
255 /com, line set 1 Tube Width for Half Tubes on Symmetry Plane
256 L,     197,     206  ! Line 10
257 L,     196,     205
258 L,     195,     201
259 L,     194,     200
260 L,     193,     204
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 261  L,      192,      203
 262  L,      191,      199
 263  L,      190,      198
 264  L,      189,      202
 265  L,      188,      138
 266  L,      187,      133  ! 20
 267  L,       68,       13
 268  L,       69,       18
 269  L,       70,       85
 270  L,       71,       80
 271  L,       72,       81
 272  L,       73,       86
 273  L,       74,       87
 274  L,       75,       82
 275  L,       76,       83
 276  L,       77,       88  ! 30
 277  L,       78,       89
 278  lesize,all,,,htwd,1,0
 279  /com, line set 2 Tube Widths
 280  L,      211,      218
 281  L,      210,      220
 282  L,      215,      217
 283  L,      214,      216
 284  L,      209,      219
 285  L,      208,      159
 286  L,      213,      155
 287  L,      151,      152
 288  L,      145,      146  ! 40
 289  L,      139,      140
 290  L,      134,      135
 291  L,       14,       15
 292  L,       19,       20
 293  L,       25,       26
 294  L,       31,       32
 295  L,       98,       35
 296  L,       92,       39
 297  L,       93,      106
 298  L,       99,      102  ! 50
 299  L,      100,      103
 300  L,       94,      107
 301  L,       95,      104
 302  lesize,all,,,twd,1,0
 303  /com, line set 3 Tube Widths on End Column
 304  L,      162,      163
 305  L,      160,      161
 306  L,      156,      157
 307  L,      153,      154
 308  L,      147,      148
 309  L,      141,      142
 310  L,      136,      137  ! 60
 311  L,       16,       17
 312  L,       21,       22
 313  L,       27,       28
 314  L,       33,       34
 315  L,       36,       37
 316  L,       40,       41
 317  L,       42,       43
 318  lesize,all,,,twd,1,0
 319  /com, line set 4 Tube Heights
 320  L,      201,      200
 321  L,      205,      204
 322  L,      210,      209  ! 70
 323  L,      215,      214
 324  L,      217,      216
 325  L,      220,      219
 326  L,      221,      162
 327  L,      199,      198
 328  L,      203,      202
 329  L,      208,      145
 330  L,      213,      151
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 331  L,      155,      152
 332  L,      159,      146  ! 80
 333  L,      160,      147
 334  L,      156,      153
 335  L,      157,      154
 336  L,      161,      148
 337  L,      133,       13
 338  L,      138,       18
 339  L,      139,       19
 340  L,      134,       14
 341  L,      135,       15
 342  L,      140,       20  ! 90
 343  L,      141,       21
 344  L,      136,       16
 345  L,      137,       17
 346  L,      142,       22
 347  L,      143,       23
 348  L,       80,       81
 349  L,       85,       86
 350  L,       25,       92
 351  L,       31,       98
 352  L,       32,       35  ! 100
 353  L,       26,       39
 354  L,       27,       40
 355  L,       33,       36
 356  L,       34,       37
 357  L,       28,       41
 358  L,       29,       38
 359  L,       82,       83
 360  L,       87,       88
 361  L,       93,       94
 362  L,       99,      100  ! 110
 363  L,      102,      103
 364  L,      106,      107
 365  L,       42,      109
 366  L,      158,      149
 367  lesize,all,,,thd,1,0
 368  /com, line set 5 End Guide Fins
 369  L,      207,      206
 370  L,      212,      211
 371  L,      150,      149
 372  L,      144,      143
 373  L,       24,       23
 374  L,       30,       29  ! 120
 375  L,       96,       95
 376  L,       90,       89
 377  lesize,all,,,egfd,1,0
 378  /com, line set 6 SS-B Plate Thickness
 379  L,      197,      196
 380  L,      206,      205
 381  L,      211,      210
 382  L,      207,      212
 383  L,      206,      211
 384  L,      205,      210
 385  L,      218,      220
 386  L,      220,      221  ! 130
 387  L,      193,      192
 388  L,      204,      203
 389  L,      209,      208
 390  L,      204,      209
 391  L,      203,      208
 392  L,      219,      159
 393  L,      162,      160
 394  L,      163,      161
 395  L,      161,      158
 396  L,      219,      162  ! 140
 397  L,      159,      160
 398  L,      189,      188
 399  L,      202,      138
 400  L,      145,      139
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401  L,     202,     145
402  L,     138,     139
403  L,     146,     140
404  L,     147,     141
405  L,     146,     147
406  L,     140,     141  ! 150
407  L,     148,     142
408  L,     149,     143
409  L,     148,     149
410  L,     142,     143
411  L,     150,     144
412  L,      69,      70
413  L,      18,      85
414  L,      19,      25
415  L,      18,      19
416  L,      85,      25  ! 160
417  L,      20,      26
418  L,      21,      27
419  L,      20,      21
420  L,      26,      27
421  L,      22,      28
422  L,      22,      23
423  L,      28,      29
424  L,      23,      29
425  L,      24,      30
426  L,      73,      74  ! 170
427  L,      86,      87
428  L,      92,      93
429  L,      86,      92
430  L,      87,      93
431  L,      39,     106
432  L,      40,      42
433  L,      39,      40
434  L,     106,      42
435  L,      38,      41
436  L,      41,      43  ! 180
437  L,      77,      78
438  L,      88,      89
439  L,      94,      95
440  L,      88,      94
441  L,      89,      95
442  L,      90,      96
443  L,     109,     107
444  L,     107,     104
445  L,     224,     225
446  L,     230,     231  ! 190
447  L,     236,     237
448  L,     226,     227
449  L,     227,     228
450  L,     232,     233
451  L,     233,     234
452  L,     238,     239
453  L,     239,     240
454  L,     171,     170
455  L,     170,     169
456  L,     178,     177  ! 200
457  L,     177,     176
458  L,     185,     184
459  L,     184,     183
460  L,     168,     167
461  L,     175,     174
462  L,     182,     181
463  L,      47,      48
464  L,      54,      55
465  L,      61,      62
466  L,      49,      50  ! 210
467  L,      50,      51
468  L,      56,      57
469  L,      57,      58
470  L,      63,      64
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```
471 L,      64,      65
472 L,     117,     116
473 L,     116,     115
474 L,     124,     123
475 L,     123,     122
476 L,     131,     130  ! 220
477 L,     130,     129
478 L,     114,     113
479 L,     121,     120
480 L,     128,     127
481 lesize,all,,,ptd,1,0
482 /com, line set 7 tube thickness
483 L,     196,     195
484 L,     205,     201
485 L,     204,     200
486 L,     193,     194
487 L,     210,     215
488 L,     220,     217  ! 230
489 L,     219,     216
490 L,     209,     214
491 L,     192,     191
492 L,     203,     199
493 L,     202,     198
494 L,     189,     190
495 L,     208,     213
496 L,     159,     155
497 L,     146,     152
498 L,     145,     151  ! 240
499 L,     160,     156
500 L,     161,     157
501 L,     148,     154
502 L,     147,     153
503 L,     188,     187
504 L,     138,     133
505 L,      18,      13
506 L,      69,      68
507 L,     139,     134
508 L,     140,     135  ! 250
509 L,      20,      15
510 L,      19,      14
511 L,     141,     136
512 L,     142,     137
513 L,      22,      17
514 L,      21,      16
515 L,      70,      71
516 L,      85,      80
517 L,      86,      81
518 L,      73,      72  ! 260
519 L,      25,      31
520 L,      26,      32
521 L,      39,      35
522 L,      92,      98
523 L,      27,      33
524 L,      28,      34
525 L,      41,      37
526 L,      40,      36
527 L,      74,      75
528 L,      87,      82  ! 270
529 L,      88,      83
530 L,      77,      76
531 L,      93,      99
532 L,     106,     102
533 L,     107,     103
534 L,      94,     100
535 lesize,all,,,ttd,1,0
536 csys,1
537 /com, line set 8, arc 1 bottom
538 L,     222,     207
539 L,     223,     224
540 L,     229,     230
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L,     235,     236  ! 280
lesize,all,,,a1d,1,0
/com, line set 9, arc 2 side arcs
L,     212,     218
L,     225,     226
L,     231,     232
L,     237,     238
lesize,all,,,a2d,1,0
/com, line set 10, arc 3 side arcs
L,     221,     163
L,     228,     171
L,     234,     178
L,     240,     185
lesize,all,,,a3d,1,0
/com, line set 11, arc 4 side arcs
L,     158,     150
L,     169,     168  ! 290
L,     176,     175
L,     183,     182
lesize,all,,,a4d,1,0
/com, line set 12, arc 5 side arcs
L,     144,      24
L,     167,      47
L,     174,      54
L,     181,      61
lesize,all,,,a5d,1,0
/com, line set 13, arc 6 side arcs
L,      30,      38
L,      48,      49
L,      55,      56
L,      62,      63  ! 300
lesize,all,,,a6d,1,0
/com, line set 14, arc 7 side arcs
L,      43,     109
L,      51,     117
L,      58,     124
L,      65,     131
lesize,all,,,a7d,1,0
/com, line set 15, arc 8 side arcs
L,     104,      96
L,     115,     114
L,     122,     121
L,     129,     128
lesize,all,,,a8d,1,0
/com, line set 16, arc 9 top arcs
L,      90,     110
L,     113,     112  ! 310
L,     120,     119
L,     127,     126
lesize,all,,,a9d,1,0
csys,0
/com, line set 17 IB thickness
L,     222,     223
L,     207,     224
L,     212,     225
L,     218,     226
L,     220,     227
L,     221,     228
L,     163,     171
L,     161,     170  ! 320
L,     158,     169
L,     150,     168
L,     144,     167
L,      24,      47
L,      30,      48
L,      38,      49
L,      41,      50
L,      43,      51
L,     109,     117
L,     107,     116  ! 330
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611  L,     104,     115
612  L,      96,     114
613  L,      90,     113
614  L,     110,     112
615  lesize,all,,,ibtd,1,0
616  /com, line set 18 OB inner thickness
617  L,     223,     229
618  L,     224,     230
619  L,     225,     231
620  L,     226,     232
621  L,     227,     233
622  L,     228,     234  ! 340
623  L,     171,     178
624  L,     170,     177
625  L,     169,     176
626  L,     168,     175
627  L,     167,     174
628  L,      47,      54
629  L,      48,      55
630  L,      49,      56
631  L,      50,      57
632  L,      51,      58  ! 350
633  L,     117,     124
634  L,     116,     123
635  L,     115,     122
636  L,     114,     121
637  L,     113,     120
638  L,     112,     119
639  lesize,all,,,obitd,1,0
640  /com, line set 19 skirt thickness
641  L,     229,     235
642  L,     230,     236
643  L,     231,     237
644  L,     232,     238  ! 360
645  L,     233,     239
646  L,     234,     240
647  L,     178,     185
648  L,     177,     184
649  L,     176,     183
650  L,     175,     182
651  L,     174,     181
652  L,      54,      61
653  L,      55,      62
654  L,      56,      63  ! 370
655  L,      57,      64
656  L,      58,      65
657  L,     124,     131
658  L,     123,     130
659  L,     122,     129
660  L,     121,     128
661  L,     120,     127
662  L,     119,     126
663  lesize,all,,,std,1,0
664  /com, lines to fill in lids
665  /com, lines tube height
666  l,195,194            ! 379
667  l,191,190            ! 380
668  l,187,68             ! 381
669  l,71,72              ! 382
670  l,75,76              ! 383
671  lesize,all,,,thd,1,0
672  /com, end lines
673  l,222,197            ! 384
674  l,78,110             ! 385
675  lesize,all,,,egfd,1,0
676  /com, area set 1, tubes
677  a,195,196,205,201
678  a,200,201,205,204
679  a,193,194,200,204
680  a,191,192,203,199
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a,198,199,203,202
a,189,190,198,202
a,187,188,138,133
a,133,138,18,13
a,69,68,13,18
a,71,70,85,80
a,80,85,86,81
a,73,72,81,86
a,75,74,87,82
a,82,87,88,83
a,77,76,83,88
a,209,210,215,214
a,215,210,220,217
a,216,217,220,219
a,209,214,216,219
a,145,208,213,151
a,213,208,159,155
a,152,155,159,146
a,145,151,152,146
a,134,139,140,135
a,135,140,20,15
a,19,14,15,20
a,19,139,134,14
a,92,25,31,98
a,31,25,26,32
a,32,26,39,35
a,92,98,35,39
a,94,93,99,100
a,99,93,106,102
a,102,106,107,103
a,94,100,103,107
a,156,160,161,157
a,157,161,148,154
a,147,153,154,148
a,147,160,156,153
a,136,141,142,137
a,137,142,22,17
a,21,16,17,22
a,21,141,136,16
a,33,27,28,34
a,34,28,41,37
a,40,36,37,41
a,40,27,33,36
/com, area set 2, plates
a,204,205,210,209
a,192,193,204,203
a,203,204,209,208
a,208,209,219,159
a,202,203,208,145
a,146,159,160,147
a,188,189,202,138
a,138,202,145,139
a,139,145,146,140
a,140,146,147,141
a,141,147,148,142
a,18,138,139,19
a,20,140,141,21
a,70,69,18,85
a,85,18,19,25
a,25,19,20,26
a,26,20,21,27
a,27,21,22,28
a,86,85,25,92
a,39,26,27,40
a,74,73,86,87
a,87,86,92,93
a,93,92,39,106
a,88,87,93,94
/com, area set 3, end guides
a,196,197,206,205
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751  a,205,206,211,210
752  a,206,207,212,211
753  a,210,211,218,220
754  a,148,161,158,149
755  a,142,148,149,143
756  a,143,149,150,144
757  a,22,142,143,23
758  a,28,22,23,29
759  a,29,23,24,30
760  a,41,28,29,38
761  a,95,94,107,104
762  a,89,88,94,95
763  a,90,89,95,96
764  a,78,77,88,89
765  /com, area set 4, corner guides
766  a,219,220,221,162
767  a,159,219,162,160
768  a,160,162,163,161
769  a,107,106,42,109
770  a,106,39,40,42
771  a,42,40,41,43
772  csys,1
773  /com, area set 5, inner barrier
774  a,222,223,224,207
775  a,207,224,225,212
776  a,212,225,226,218
777  a,218,226,227,220
778  a,220,227,228,221
779  a,221,228,171,163
780  a,163,171,170,161
781  a,161,170,169,158
782  a,158,169,168,150
783  a,150,168,167,144
784  a,144,167,47,24
785  a,24,47,48,30
786  a,30,48,49,38
787  a,38,49,50,41
788  a,41,50,51,43
789  a,43,51,117,109
790  a,109,117,116,107
791  a,107,116,115,104
792  a,104,115,114,96
793  a,90,96,114,113
794  a,90,113,112,110
795  /com, area set 6, outer barrier
796  !a,223,229,230,224
797  !a,224,230,231,225
798  !a,225,231,232,226
799  !a,226,232,233,227
800  !a,227,233,234,228
801  !a,228,234,178,171
802  !a,171,178,177,170
803  !a,170,177,176,169
804  !a,169,176,175,168
805  !a,168,175,174,167
806  !a,167,174,54,47
807  !a,47,54,55,48
808  !a,48,55,56,49
809  !a,49,56,57,50
810  !a,50,57,58,51
811  !a,51,58,124,117
812  !a,117,124,123,116
813  !a,116,123,122,115
814  !a,115,122,121,114
815  !a,114,121,120,113
816  !a,113,120,119,112
817  !a,229,235,236,230
818  !a,236,237,231,230
819  !a,231,237,238,232
820  !a,238,239,233,232
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821  !a,239,240,234,233
822  !a,240,185,178,234
823  !a,185,184,177,178
824  !a,184,183,176,177
825  !a,176,183,182,175
826  !a,175,182,181,174
827  !a,174,181,61,54
828  !a,54,61,62,55
829  !a,55,62,63,56
830  !a,56,63,64,57
831  !a,57,64,65,58
832  !a,58,65,131,124
833  !a,124,131,130,123
834  !a,123,130,129,122
835  !a,122,129,128,121
836  !a,121,128,127,120
837  !a,120,127,126,119
838  csys,0
839  vdrag,all,,,,,,1          ! Drag Basket
840  asel,s,loc,z,bkht
841  csys,1
842  asel,u,loc,x,0,ibir-0.03
843  csys,0
844  vdrag,all,,,,,,2          ! Drag Basket to Lid Gap
845  /com, copy areas from top of basket to bottom of lid
846  asel,s,loc,z,bkht-0.01
847  csys,1
848  asel,r,loc,x,0,ibir-0.03
849  csys,0
850  agen,2,all,,,,,0.01
851  nummrg,kp
852  /com, generate lines to fill in lid at top of WP
853  /com, lines tube height
854  L,414,421  ! 1121
855  L,422,429  ! 1124
856  L,430,437  ! 1125
857  L,438,445  ! 1131
858  L,446,453  ! 1138
859  lesize,all,,,thd,1,0
860  /com, end lines
861  L,370,518  ! 1141
862  L,539,413  ! 1151
863  lesize,all,,,egfd,1,0
864  al,832,1116,1120,1141
865  al,936,937,941,1121
866  al,946,947,951,1124
867  al,956,959,961,1125
868  al,966,969,971,1131
869  al,976,979,981,1138
870  al,932,1143,1147,1151
871  al,842,1122,1123
872  al,985,989,990,993
873  al,997,1001,1002,1005
874  al,1010,1013,1015,1018
875  al,1021,1025,1028,1029
876  al,1033,1037,1040,1041
877  al,922,1144,1148
878  al,857,1153,1156
879  al,1046,1049,1051,1054
880  al,1058,1061,1063,1066
881  al,1070,1073,1075,1078
882  al,907,1159,1163
883  al,872,1126,1130
884  al,882,1132,1133,1137
885  al,892,1139,1140
886  asel,s,loc,z,ibht+0.01
887  vdrag,all,,,,,,3          ! Drag Inner Barrier Upper Lid
888  !asel,s,loc,z,elev1+0.015
889  !csys,1
890  !asel,r,loc,x,obir,obor
```

```
!csys,0
!vdrag,all,,,,,4          ! Drag Lid to Lid Gap
!asel,s,loc,z,elev1+0.015
!asel,r,loc,z,elev1-0.015
!csys,1
!asel,r,loc,x,0,obir
!csys,0
!agen,2,all,,,,,ltlgh
!nummrg,kp
!asel,s,loc,z,elev2+0.015
!vdrag,all,,,,,,5         ! Drag Outer Barrier Upper Lid
!asel,s,loc,z,elev3
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,6         ! Drag Upper Skirt
/com, lines at bottom lid used to be here
!al,10,115,277,384
!al,12,13,68,379
!al,16,17,75,380
!al,20,21,85,381
!al,24,25,96,382
!al,28,29,107,383
!al,31,122,309,385
!al,32,116,281
!al,34,35,71,72
!al,38,39,78,79
!al,42,43,88,89
!al,46,47,99,100
!al,50,51,110,111
!al,53,121,305
!al,54,74,285
!al,56,57,82,83
!al,60,61,92,93
!al,64,65,103,104
!al,67,113,301
!al,114,117,289
!al,95,118,119,293
!al,106,120,297
!asel,s,loc,z,0
!vdrag,all,,,,,,7         ! Drag Inner Barrier Lower Lid
!csys,0
!asel,s,loc,z,-iblt
!vdrag,all,,,,,,8         ! Drag Outer Barrier Lower Lid
!asel,s,loc,z,elev5
!csys,1
!asel,r,loc,x,obsr,obor
!csys,0
!vdrag,all,,,,,,9         ! Drag Lower Skirt
/com
/com, Mesh Volumes
/com
/com, Mesh the CS Tubes
/com
!vsel,s,volu,,1,47
!type,1
!mat,1
!vmesh,all
/com, Mesh SS-B Plates
vsel,s,volu,,48,71
type,2
mat,2
vmesh,all
/com, Mesh End Guides
vsel,s,volu,,72,86
type,3
mat,3
vmesh,all
/com, Mesh Corner Guides
vsel,s,volu,,87,92
```

```
type,4
mat,4
vmesh,all
/com, Mesh Inner Barrier
vsel,s,loc,z,0,elev1
csys,1
vsel,r,loc,x,0,obir
vsel,u,volu,,1,92
vsel,u,loc,x,ibir-0.02,obir
vsel,a,loc,y,-90,5
vsel,u,volu,,1,92
vsel,u,loc,x,obir,obor
vsel,r,loc,z,-iblt,elev1
csys,0
type,5
mat,5
vmesh,all
/com, Mesh Upper Inner Barrier Adding Backfill Mass
vsel,inve
csys,1
vsel,u,loc,x,obir,obor
vsel,r,loc,z,0,elev1
vsel,u,volu,,1,92
csys,0
type,6
mat,6
vmesh,all
/com, Mesh Lower Outer Barrier and Lids
!vsel,inve
!vsel,u,volu,,1,92
!csys,1
!vsel,u,loc,x,obir,obor
!vsel,a,loc,y,-90,5
!vsel,u,volu,,1,92
!vsel,u,type,,5
!type,6
!mat,6
!vmesh,all
/com, mesh upper outer barrier adding backfill mass
!vsel,inve
!vsel,u,type,,1,5
!type,7
!mat,7
!vmesh,all
/com
/com, Apply Symmetry Constraints
csys,0
nsel,s,loc,x,0
dsym,symm,x,0
nsel,s,loc,z,0
dsym,symm,z,0
/com, Apply Constraints at Support Locations
/com, Span approximately half of basket height, width = 0.305 m
csys,1
nsel,s,loc,z,(7*bkht/bd),(10*bkht/bd)+0.02
nsel,r,loc,x,obir-0.001,obir+0.001
nsel,r,loc,y,-70,-50
csys,0
d,all,uy,0
allsel
save
fini

/sol
antype,modal
modopt,subsp,8
outres,all,1
save
solve
fini
```

```
 1031
 1032  /sol
 1033  expass,on
 1034  mxpand,8,,,yes
 1035  solve
 1036  fini
 1037
 1038  /sol
 1039  antype,spectr
 1040  spopt,sprs,,on
 1041  sed,,1
 1042  svtyp,2
 1043  freq,0.1,100
 1044  sv,,16.285,16.285
 1045  mcomb,srss,1e-8
 1046  outres,all,1
 1047  save
 1048  solve
 1049  fini
 1050  /exit
 1051  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,
```

```
ABBREVIATION= RO        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= TO        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= CO        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,

ABBREVIATION= PRO       /psf,pres,norm,0,

ABBREVIATION= U1        /pbc,u,1,

ABBREVIATION= UO        /pbc,u,0,

ABBREVIATION= X3D       /show,3d,

ABBREVIATION= X11       /show,x11,

ABBREVIATION= X11C      /show,x11c,

ABBREVIATION= ON        /menu,on,
XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW  1   25.00
   ***********************************************************************
   END  start.ans
   ***********************************************************************

   To start ANSYS menu:

   type:   x3d  for console
           x11  for X-term color
           x11c for X-term color contour

   type:   on

   ***********************************************************************
**************************************************************************
**************************************************************************
*****  Seismic Analysis of 21 PWR Waste Package Under Degradation     *****
*****  Degree of Degradation in Outer Barrier: 100%                   *****
*****  Degree of Degradation in Inner Barrier:  90%                   *****
*****  Degree of Degradation in Basket Assembly:  Tubes 100%          *****
*****                                             Guides 50%          *****
*****                                             SS-B Plates 50%     *****
*****  Backfill Present, Backfill Porosity:  25%, Rock Porosity:  10% *****
*****  Quarter Symmetry Model                                         *****
**************************************************************************
**************************************************************************
**************************************************************************


NUMBER OF DATA BASE PAGES IN MEMORY     (NVPAGE)=       512

SI UNITS SPECIFIED FOR INTERNAL
 LENGTH         (l)  = METER(M)
 MASS           (M)  = KILOGRAM(KG)
 TIME           (t)  = SECOND(SEC)
 TEMPERATURE    (T)  = KELVIN(K)
 TOFFSET             = 0.0 KELVIN
 CHARGE         (Q)  = COULOMB
 CURRENT        (i)  = AMPERE (COULOMBS/SEC)
 FORCE          (f)  = NEWTON(N) (KG-M/SEC2)
 PRESSURE            = PASCAL (NEWTON/M**2)
 ENERGY         (W)  = JOULE (N-M)
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 POWER          (P)  = WATT (N-M/SEC)
 CAPACITANCE    (C)  = FARAD
 INDUCTANCE     (L)  = HENRY
 MAGNETIC FLUX       = WEBER
 RESISTANCE     (R)  = OHM
 ELECTRIC POTENTIAL = VOLT

 INPUT UNITS ARE ALSO SET TO SI
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   20:53:34  JUN 08, 1996 CP=      0.460
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844



         ***** ANSYS ANALYSIS DEFINITION (PREP7) *****

 TITLE=
  21 PWR Tube Seismic Analysis With Backfill


 VIEW CONE ANGLE FOR WINDOW  1    0.00
  Define Parameters

 PARAMETER IBIR     =    0.7109500

 PARAMETER OBIR     =    0.7129500

 PARAMETER OBSR     =    0.7709500

 PARAMETER OBOR     =    0.7809500

 PARAMETER TS1      =    0.3500000E-02

 PARAMETER TS2      =    0.5000000E-02

 PARAMETER TS3      =    0.5000000E-02

 PARAMETER TS4      =    0.5000000E-02

 PARAMETER EGIH     =    0.8550000E-01

 PARAMETER PIE      =     3.141593

 PARAMETER ANG1     =    0.5235988

 PARAMETER ANG2     =     1.396263

 PARAMETER ANG3     =     1.012291

 PARAMETER TW       =    0.2285000

 PARAMETER POS1     =    0.1142500

 PARAMETER POS2     =    0.1192500

 PARAMETER POS3     =    0.1227500

 PARAMETER POS4     =    0.1277500

 PARAMETER POS5     =    0.3562500

 PARAMETER POS6     =    0.3612500

 PARAMETER POS7     =    0.3647500

 PARAMETER POS8     =    0.3697500
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PARAMETER POS9 = 0.5982500

PARAMETER POS10 = 0.6032500

PARAMETER POS11 = 0.6082500

PARAMETER POSG = 0.3662500

PARAMETER POSEI = 0.6937500

PARAMETER POSEO = 0.6928684

PARAMETER POSEN = 0.1185000

PARAMETER POSEF = 0.1235000

PARAMETER POSEG = 0.3525897

PARAMETER POSCG = 0.6001257

PARAMETER BKHT = 2.287500

PARAMETER IBHT = 2.297500

PARAMETER IBLT = 0.1000000E-01

PARAMETER ELEV1 = 2.307500

PARAMETER LTLGH = 0.3000000E-01

PARAMETER ELEV2 = 2.337500

PARAMETER OBLT = 0.6000000E-01

PARAMETER ELEV3 = 2.397500

PARAMETER STHT = 0.2250000

PARAMETER ELEV4 = 2.622500

PARAMETER ELEV5 = -0.7000000E-01

PARAMETER ELEV6 = -0.2950000
Line Divisions

PARAMETER SHD = 1.000000

PARAMETER OBLD = 1.000000

PARAMETER GD = 2.000000

PARAMETER IBLD = 2.000000

PARAMETER BD = 15.00000

PARAMETER HTWD = 4.000000

PARAMETER TWD = 4.000000

PARAMETER THD = 4.000000

PARAMETER EGFD = 4.000000

PARAMETER PTD = 2.000000

PARAMETER TTD = 1.000000

PARAMETER A1D = 4.000000

PARAMETER A2D = 4.000000

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 PARAMETER A3D      =     4.000000

 PARAMETER A4D      =     4.000000

 PARAMETER A5D      =     4.000000

 PARAMETER A6D      =     4.000000

 PARAMETER A7D      =     4.000000

 PARAMETER A8D      =     4.000000

 PARAMETER A9D      =     4.000000

 PARAMETER IBTD     =     2.000000

 PARAMETER OBITD    =     2.000000

 PARAMETER STD      =     2.000000
  Define Element Properties

 ELEMENT TYPE    1 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    2 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    3 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    4 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    5 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL

 ELEMENT TYPE    6 IS SOLID45      3-D STRUCTURAL SOLID
  KEYOPT(1-12)=    0  0  0    0  0  0    0  0  0    0  0  0

 CURRENT NODAL DOF SET IS  UX    UY    UZ
  THREE-DIMENSIONAL MODEL
  ratio of static to dynamic coeff. of friction fact=1.298, Area Tol.=15%
  Room Temperature Properties of Materials

 MATERIAL    1          EX   =   0.2060000E+12

 MATERIAL    2          EX   =   0.1950000E+12

 MATERIAL    3          EX   =   0.2060000E+12

 MATERIAL    4          EX   =   0.2060000E+12

 MATERIAL    5          EX   =   0.2080000E+12
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MATERIAL    6       EX   =  0.2080000E+12
MATERIAL    1       NUXY =  0.3000000
MATERIAL    2       NUXY =  0.2980000
MATERIAL    3       NUXY =  0.3000000
MATERIAL    4       NUXY =  0.3000000
MATERIAL    5       NUXY =  0.2780000
MATERIAL    6       NUXY =  0.2780000
MATERIAL    1       DENS =   8131.000
MATERIAL    2       DENS =   100452.2
MATERIAL    3       DENS =   21221.91
MATERIAL    4       DENS =   21221.91
MATERIAL    5       DENS =   8442.000
MATERIAL    6       DENS =   1420770.
 Define keypoints in the basket assembly
ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
KEYPOINT      1  X,Y,Z=  0.000000E+00  0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      2  X,Y,Z=  0.114250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      3  X,Y,Z=  0.119250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      4  X,Y,Z=  0.122750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      5  X,Y,Z=  0.127750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      6  X,Y,Z=  0.356250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      7  X,Y,Z=  0.361250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      8  X,Y,Z=  0.364750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT      9  X,Y,Z=  0.369750      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     10  X,Y,Z=  0.598250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     11  X,Y,Z=  0.603250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     12  X,Y,Z=  0.608250      0.000000E+00  0.000000E+00  IN CSYS=  0
KEYPOINT     13  X,Y,Z=  0.114250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     14  X,Y,Z=  0.127750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     15  X,Y,Z=  0.356250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     16  X,Y,Z=  0.369750      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     17  X,Y,Z=  0.598250      0.114250      0.000000E+00  IN CSYS=  0
KEYPOINT     18  X,Y,Z=  0.119250      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     19  X,Y,Z=  0.122750      0.119250      0.000000E+00  IN CSYS=  0
KEYPOINT     20  X,Y,Z=  0.361250      0.119250      0.000000E+00  IN CSYS=  0
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```
 KEYPOINT     21   X,Y,Z=  0.364750      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     22   X,Y,Z=  0.603250      0.119250      0.000000E+00  IN CSYS=  0
 KEYPOINT     23   X,Y,Z=  0.608250      0.118500      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT     24   X,Y,Z=  0.710950       9.69319      0.000000E+00  IN CSYS=  1
                      0.700800      0.119704      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT     25   X,Y,Z=  0.122750      0.122750      0.000000E+00  IN CSYS=  0
 KEYPOINT     26   X,Y,Z=  0.361250      0.122750      0.000000E+00  IN CSYS=  0
 KEYPOINT     27   X,Y,Z=  0.364750      0.122750      0.000000E+00  IN CSYS=  0
 KEYPOINT     28   X,Y,Z=  0.603250      0.122750      0.000000E+00  IN CSYS=  0
 KEYPOINT     29   X,Y,Z=  0.608250      0.123500      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT     30   X,Y,Z=  0.710950       10.1065      0.000000E+00  IN CSYS=  1
                      0.699918      0.124757      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT     31   X,Y,Z=  0.127750      0.127750      0.000000E+00  IN CSYS=  0
 KEYPOINT     32   X,Y,Z=  0.356250      0.127750      0.000000E+00  IN CSYS=  0
 KEYPOINT     33   X,Y,Z=  0.369750      0.127750      0.000000E+00  IN CSYS=  0
 KEYPOINT     34   X,Y,Z=  0.598250      0.127750      0.000000E+00  IN CSYS=  0
 KEYPOINT     35   X,Y,Z=  0.356250      0.356250      0.000000E+00  IN CSYS=  0
 KEYPOINT     36   X,Y,Z=  0.369750      0.356250      0.000000E+00  IN CSYS=  0
 KEYPOINT     37   X,Y,Z=  0.598250      0.356250      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT     38   X,Y,Z=  0.710950       30.1000      0.000000E+00  IN CSYS=  1
                      0.615080      0.356549      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT     39   X,Y,Z=  0.361250      0.361250      0.000000E+00  IN CSYS=  0
 KEYPOINT     40   X,Y,Z=  0.364750      0.361250      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 KEYPOINT     41   X,Y,Z=  0.710950       30.9148      0.000000E+00  IN CSYS=  1
                      0.609947      0.365260      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 KEYPOINT     42   X,Y,Z=  0.366250      0.366250      0.000000E+00  IN CSYS=  0
 ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
```

KEYPOINT 43 X,Y,Z= 0.710950 31.3953 0.000000E+00 IN CSYS= 1
0.606863 0.370362 0.000000E+00 IN CSYS= 0

KEYPOINT 44 X,Y,Z= 0.710950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.710950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 45 X,Y,Z= 0.710950 45.0000 0.000000E+00 IN CSYS= 1
0.502718 0.502718 0.000000E+00 IN CSYS= 0

KEYPOINT 46 X,Y,Z= 0.712950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.712950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 47 X,Y,Z= 0.712950 9.69319 0.000000E+00 IN CSYS= 1
0.702772 0.120041 0.000000E+00 IN CSYS= 0

KEYPOINT 48 X,Y,Z= 0.712950 10.1065 0.000000E+00 IN CSYS= 1
0.701887 0.125108 0.000000E+00 IN CSYS= 0

KEYPOINT 49 X,Y,Z= 0.712950 30.1000 0.000000E+00 IN CSYS= 1
0.616810 0.357552 0.000000E+00 IN CSYS= 0

KEYPOINT 50 X,Y,Z= 0.712950 30.9148 0.000000E+00 IN CSYS= 1
0.611662 0.366288 0.000000E+00 IN CSYS= 0

KEYPOINT 51 X,Y,Z= 0.712950 31.3953 0.000000E+00 IN CSYS= 1
0.608570 0.371403 0.000000E+00 IN CSYS= 0

KEYPOINT 52 X,Y,Z= 0.712950 45.0000 0.000000E+00 IN CSYS= 1
0.504132 0.504132 0.000000E+00 IN CSYS= 0

KEYPOINT 53 X,Y,Z= 0.770950 0.000000E+00 0.000000E+00 IN CSYS= 1
0.770950 0.000000E+00 0.000000E+00 IN CSYS= 0

KEYPOINT 54 X,Y,Z= 0.770950 9.69319 0.000000E+00 IN CSYS= 1
0.759944 0.129807 0.000000E+00 IN CSYS= 0

KEYPOINT 55 X,Y,Z= 0.770950 10.1065 0.000000E+00 IN CSYS= 1
0.758987 0.135285 0.000000E+00 IN CSYS= 0

KEYPOINT 56 X,Y,Z= 0.770950 30.1000 0.000000E+00 IN CSYS= 1
0.666989 0.386639 0.000000E+00 IN CSYS= 0

KEYPOINT 57 X,Y,Z= 0.770950 30.9148 0.000000E+00 IN CSYS= 1
0.661423 0.396086 0.000000E+00 IN CSYS= 0

KEYPOINT 58 X,Y,Z= 0.770950 31.3953 0.000000E+00 IN CSYS= 1
0.658078 0.401618 0.000000E+00 IN CSYS= 0

KEYPOINT 59 X,Y,Z= 0.770950 45.0000 0.000000E+00 IN CSYS= 1
0.545144 0.545144 0.000000E+00 IN CSYS= 0

KEYPOINT 60 X,Y,Z= 0.780950 0.000000E+00 0.000000E+00 IN CSYS= 1

```
                    0.780950      0.000000E+00  0.000000E+00  IN CSYS=  0

KEYPOINT     61   X,Y,Z=  0.780950       9.69319       0.000000E+00  IN CSYS=  1

                    0.769801      0.131490      0.000000E+00  IN CSYS=  0

KEYPOINT     62   X,Y,Z=  0.780950       10.1065       0.000000E+00  IN CSYS=  1

                    0.768832      0.137040      0.000000E+00  IN CSYS=  0

KEYPOINT     63   X,Y,Z=  0.780950       30.1000       0.000000E+00  IN CSYS=  1

                    0.675640      0.391654      0.000000E+00  IN CSYS=  0

KEYPOINT     64   X,Y,Z=  0.780950       30.9148       0.000000E+00  IN CSYS=  1

                    0.670002      0.401224      0.000000E+00  IN CSYS=  0

KEYPOINT     65   X,Y,Z=  0.780950       31.3953       0.000000E+00  IN CSYS=  1

                    0.666614      0.406827      0.000000E+00  IN CSYS=  0

KEYPOINT     66   X,Y,Z=  0.780950       45.0000       0.000000E+00  IN CSYS=  1

                    0.552215      0.552215      0.000000E+00  IN CSYS=  0

COORDINATE SYSTEM     11 DEFINITION.  TYPE= 0  (CARTESIAN)
  XC,YC,ZC= 0.00000E+00 0.00000E+00 0.00000E+00
  ANGLES=   45.00    0.00    0.00   PARAMETERS=   1.000   1.000
  ORIENTATION=  0.71  0.71  0.00  -0.71  0.71  0.00   0.00  0.00  1.00

ACTIVE COORDINATE SYSTEM SET TO     11  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT     13 USED FOR KEYPOINT(S)      79
KEYPOINT     18 USED FOR KEYPOINT(S)      84
KEYPOINT     25 USED FOR KEYPOINT(S)      91
KEYPOINT     31 USED FOR KEYPOINT(S)      97
KEYPOINT     35 USED FOR KEYPOINT(S)     101
KEYPOINT     39 USED FOR KEYPOINT(S)     105
KEYPOINT     42 USED FOR KEYPOINT(S)     108
KEYPOINT     45 USED FOR KEYPOINT(S)     111
KEYPOINT     52 USED FOR KEYPOINT(S)     118
KEYPOINT     59 USED FOR KEYPOINT(S)     125
KEYPOINT     66 USED FOR KEYPOINT(S)     132

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SYMMETRY TRANSFORMATION OF KEYPOINTS     USING COMPONENT  Y
  SET IS ALL SELECTED KEYPOINTS

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT      1 USED FOR KEYPOINT(S)      67
KEYPOINT      2 USED FOR KEYPOINT(S)      79
KEYPOINT      3 USED FOR KEYPOINT(S)      84
KEYPOINT      4 USED FOR KEYPOINT(S)      91
KEYPOINT      5 USED FOR KEYPOINT(S)      97
KEYPOINT      6 USED FOR KEYPOINT(S)     101
KEYPOINT      7 USED FOR KEYPOINT(S)     105
KEYPOINT      8 USED FOR KEYPOINT(S)     108
KEYPOINT      9 USED FOR KEYPOINT(S)     111
KEYPOINT     10 USED FOR KEYPOINT(S)     118
KEYPOINT     11 USED FOR KEYPOINT(S)     125
KEYPOINT     12 USED FOR KEYPOINT(S)     132
KEYPOINT     44 USED FOR KEYPOINT(S)     164
KEYPOINT     46 USED FOR KEYPOINT(S)     166
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KEYPOINT     53 USED FOR KEYPOINT(S)     173
KEYPOINT     60 USED FOR KEYPOINT(S)     180

DELETE SELECTED KEYPOINTS FROM      2 TO     12 BY      1

KEYPOINT   1001   X,Y,Z=  0.000000E+00  0.000000E+00   2.28750      IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  1001
 LINE NO.=     1  KP1=      1  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   1001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =   15,  SPACING RATIO =   0.200

KEYPOINT   2001   X,Y,Z=  0.000000E+00  0.000000E+00   2.29750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   1001  2001
 LINE NO.=     2  KP1=   1001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   2001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   3001   X,Y,Z=  0.000000E+00  0.000000E+00   2.30750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   2001  3001
 LINE NO.=     3  KP1=   2001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   3001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   4001   X,Y,Z=  0.000000E+00  0.000000E+00   2.33750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   3001  4001
 LINE NO.=     4  KP1=   3001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   4001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   5001   X,Y,Z=  0.000000E+00  0.000000E+00   2.39750      IN CSYS=  0

LINE CONNECTS KEYPOINTS   4001  5001
 LINE NO.=     5  KP1=   4001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   5001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   6001   X,Y,Z=  0.000000E+00  0.000000E+00   2.62250      IN CSYS=  0

LINE CONNECTS KEYPOINTS   5001  6001
 LINE NO.=     6  KP1=   5001  TAN1=    0.0000   0.0000  -1.0000
                  KP2=   6001  TAN2=    0.0000   0.0000   1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   7001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.100000E-01  IN CSYS=  0

LINE CONNECTS KEYPOINTS      1  7001
 LINE NO.=     7  KP1=      1  TAN1=    0.0000   0.0000   1.0000
                  KP2=   7001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    2,  SPACING RATIO =   1.000

KEYPOINT   8001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.700000E-01  IN CSYS=  0
```

```
LINE CONNECTS KEYPOINTS   7001  8001
 LINE NO.=     8  KP1=   7001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   8001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000

KEYPOINT   9001   X,Y,Z=  0.000000E+00  0.000000E+00 -0.295000      IN CSYS=  0

LINE CONNECTS KEYPOINTS   8001  9001
 LINE NO.=     9  KP1=   8001  TAN1=    0.0000   0.0000   1.0000
                  KP2=   9001  TAN2=    0.0000   0.0000  -1.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    1,  SPACING RATIO =   1.000
 line set 1 Tube Width for Half Tubes on Symmetry Plane

LINE CONNECTS KEYPOINTS    197   206
 LINE NO.=    10  KP1=    197  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    206  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    196   205
 LINE NO.=    11  KP1=    196  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    205  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    195   201
 LINE NO.=    12  KP1=    195  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    201  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    194   200
 LINE NO.=    13  KP1=    194  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    200  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    193   204
 LINE NO.=    14  KP1=    193  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    204  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    192   203
 LINE NO.=    15  KP1=    192  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    203  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    191   199
 LINE NO.=    16  KP1=    191  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    199  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    190   198
 LINE NO.=    17  KP1=    190  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    198  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    189   202
 LINE NO.=    18  KP1=    189  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    202  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    188   138
 LINE NO.=    19  KP1=    188  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    138  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    187   133
 LINE NO.=    20  KP1=    187  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    133  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     68    13
 LINE NO.=    21  KP1=     68  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     13  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     69    18
 LINE NO.=    22  KP1=     69  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     18  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     70    85
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```
 LINE NO.=    23  KP1=     70  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     85  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     71    80
 LINE NO.=    24  KP1=     71  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     80  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     72    81
 LINE NO.=    25  KP1=     72  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     81  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     73    86
 LINE NO.=    26  KP1=     73  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     86  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     74    87
 LINE NO.=    27  KP1=     74  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     87  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     75    82
 LINE NO.=    28  KP1=     75  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     82  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     76    83
 LINE NO.=    29  KP1=     76  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     83  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     77    88
 LINE NO.=    30  KP1=     77  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     88  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     78    89
 LINE NO.=    31  KP1=     78  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     89  TAN2=    1.0000   0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 2 Tube Widths

LINE CONNECTS KEYPOINTS    211   218
 LINE NO.=    32  KP1=    211  TAN1=   -0.9996   0.0293   0.0000
                  KP2=    218  TAN2=    0.9996  -0.0293   0.0000

LINE CONNECTS KEYPOINTS    210   220
 LINE NO.=    33  KP1=    210  TAN1=   -0.9996   0.0276   0.0000
                  KP2=    220  TAN2=    0.9996  -0.0276   0.0000

LINE CONNECTS KEYPOINTS    215   217
 LINE NO.=    34  KP1=    215  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    217  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    214   216
 LINE NO.=    35  KP1=    214  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    216  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    209   219
 LINE NO.=    36  KP1=    209  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    219  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    208   159
 LINE NO.=    37  KP1=    208  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    159  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    213   155
 LINE NO.=    38  KP1=    213  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    155  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    151   152
 LINE NO.=    39  KP1=    151  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    152  TAN2=    1.0000   0.0000   0.0000
```

```
LINE CONNECTS KEYPOINTS    145   146
 LINE NO.=    40  KP1=     145  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     146  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    139   140
 LINE NO.=    41  KP1=     139  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     140  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    134   135
 LINE NO.=    42  KP1=     134  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     135  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     14    15
 LINE NO.=    43  KP1=      14  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      15  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     19    20
 LINE NO.=    44  KP1=      19  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      20  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     25    26
 LINE NO.=    45  KP1=      25  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      26  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     31    32
 LINE NO.=    46  KP1=      31  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      32  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     98    35
 LINE NO.=    47  KP1=      98  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      35  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     92    39
 LINE NO.=    48  KP1=      92  TAN1=   -1.0000    0.0000    0.0000
                  KP2=      39  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     93   106
 LINE NO.=    49  KP1=      93  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     106  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     99   102
 LINE NO.=    50  KP1=      99  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     102  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    100   103
 LINE NO.=    51  KP1=     100  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     103  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     94   107
 LINE NO.=    52  KP1=      94  TAN1=   -0.9996   -0.0276    0.0000
                  KP2=     107  TAN2=    0.9996    0.0276    0.0000

LINE CONNECTS KEYPOINTS     95   104
 LINE NO.=    53  KP1=      95  TAN1=   -0.9996   -0.0293    0.0000
                  KP2=     104  TAN2=    0.9996    0.0293    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 3 Tube Widths on End Column

LINE CONNECTS KEYPOINTS    162   163
 LINE NO.=    54  KP1=     162  TAN1=   -0.9999    0.0171    0.0000
                  KP2=     163  TAN2=    0.9999   -0.0171    0.0000

LINE CONNECTS KEYPOINTS    160   161
 LINE NO.=    55  KP1=     160  TAN1=   -0.9999    0.0164    0.0000
                  KP2=     161  TAN2=    0.9999   -0.0164    0.0000

LINE CONNECTS KEYPOINTS    156   157
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```
 LINE NO.=    56  KP1=    156  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    157  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    153   154
 LINE NO.=    57  KP1=    153  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    154  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    147   148
 LINE NO.=    58  KP1=    147  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    148  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    141   142
 LINE NO.=    59  KP1=    141  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    142  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    136   137
 LINE NO.=    60  KP1=    136  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    137  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     16    17
 LINE NO.=    61  KP1=     16  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     17  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     21    22
 LINE NO.=    62  KP1=     21  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     22  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     27    28
 LINE NO.=    63  KP1=     27  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     28  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     33    34
 LINE NO.=    64  KP1=     33  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     34  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     36    37
 LINE NO.=    65  KP1=     36  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     37  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS     40    41
 LINE NO.=    66  KP1=     40  TAN1=   -0.9999   -0.0164    0.0000
                  KP2=     41  TAN2=    0.9999    0.0164    0.0000

LINE CONNECTS KEYPOINTS     42    43
 LINE NO.=    67  KP1=     42  TAN1=   -0.9999   -0.0171    0.0000
                  KP2=     43  TAN2=    0.9999    0.0171    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
    TO  NDIV =     4,  SPACING RATIO =   1.000
 Line set 4 Tube Heights

LINE CONNECTS KEYPOINTS    201   200
 LINE NO.=    68  KP1=    201  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    200  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    205   204
 LINE NO.=    69  KP1=    205  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    204  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    210   209
 LINE NO.=    70  KP1=    210  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    209  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    215   214
 LINE NO.=    71  KP1=    215  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    214  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    217   216
 LINE NO.=    72  KP1=    217  TAN1=    0.0000   -1.0000    0.0000
                  KP2=    216  TAN2=    0.0000    1.0000    0.0000
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```
LINE CONNECTS KEYPOINTS    220   219
 LINE NO.=    73  KP1=     220  TAN1=    0.0164  -0.9999   0.0000
                  KP2=     219  TAN2=   -0.0164   0.9999   0.0000

LINE CONNECTS KEYPOINTS    221   162
 LINE NO.=    74  KP1=     221  TAN1=    0.0171  -0.9999   0.0000
                  KP2=     162  TAN2=   -0.0171   0.9999   0.0000

LINE CONNECTS KEYPOINTS    199   198
 LINE NO.=    75  KP1=     199  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     198  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   202
 LINE NO.=    76  KP1=     203  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     202  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   145
 LINE NO.=    77  KP1=     208  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     145  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    213   151
 LINE NO.=    78  KP1=     213  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     151  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    155   152
 LINE NO.=    79  KP1=     155  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     152  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    159   146
 LINE NO.=    80  KP1=     159  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     146  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    160   147
 LINE NO.=    81  KP1=     160  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     147  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    156   153
 LINE NO.=    82  KP1=     156  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     153  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    157   154
 LINE NO.=    83  KP1=     157  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     154  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    161   148
 LINE NO.=    84  KP1=     161  TAN1=    0.0276  -0.9996   0.0000
                  KP2=     148  TAN2=   -0.0276   0.9996   0.0000

LINE CONNECTS KEYPOINTS    133    13
 LINE NO.=    85  KP1=     133  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      13  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138    18
 LINE NO.=    86  KP1=     138  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      18  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    139    19
 LINE NO.=    87  KP1=     139  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      19  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    134    14
 LINE NO.=    88  KP1=     134  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      14  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    135    15
 LINE NO.=    89  KP1=     135  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      15  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    140    20
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 LINE NO.=    90  KP1=    140  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     20  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    141    21
 LINE NO.=    91  KP1=    141  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     21  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    136    16
 LINE NO.=    92  KP1=    136  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     16  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    137    17
 LINE NO.=    93  KP1=    137  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     17  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    142    22
 LINE NO.=    94  KP1=    142  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     22  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    143    23
 LINE NO.=    95  KP1=    143  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     23  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     80    81
 LINE NO.=    96  KP1=     80  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     81  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    86
 LINE NO.=    97  KP1=     85  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     86  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    92
 LINE NO.=    98  KP1=     25  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     92  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     31    98
 LINE NO.=    99  KP1=     31  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     98  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     32    35
 LINE NO.=   100  KP1=     32  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     35  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     26    39
 LINE NO.=   101  KP1=     26  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     39  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     27    40
 LINE NO.=   102  KP1=     27  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     40  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     33    36
 LINE NO.=   103  KP1=     33  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     36  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     34    37
 LINE NO.=   104  KP1=     34  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     37  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     28    41
 LINE NO.=   105  KP1=     28  TAN1=   -0.0276  -0.9996   0.0000
                  KP2=     41  TAN2=    0.0276   0.9996   0.0000

LINE CONNECTS KEYPOINTS     29    38
 LINE NO.=   106  KP1=     29  TAN1=   -0.0293  -0.9996   0.0000
                  KP2=     38  TAN2=    0.0293   0.9996   0.0000

LINE CONNECTS KEYPOINTS     82    83
 LINE NO.=   107  KP1=     82  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     83  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS     87    88
 LINE NO.=    108  KP1=     87  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     88  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     93    94
 LINE NO.=    109  KP1=     93  TAN1=    0.0000   -1.0000    0.0000
                   KP2=     94  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     99   100
 LINE NO.=    110  KP1=     99  TAN1=    0.0000   -1.0000    0.0000
                   KP2=    100  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    102   103
 LINE NO.=    111  KP1=    102  TAN1=    0.0000   -1.0000    0.0000
                   KP2=    103  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    106   107
 LINE NO.=    112  KP1=    106  TAN1=   -0.0164   -0.9999    0.0000
                   KP2=    107  TAN2=    0.0164    0.9999    0.0000

LINE CONNECTS KEYPOINTS     42   109
 LINE NO.=    113  KP1=     42  TAN1=   -0.0171   -0.9999    0.0000
                   KP2=    109  TAN2=    0.0171    0.9999    0.0000

LINE CONNECTS KEYPOINTS    158   149
 LINE NO.=    114  KP1=    158  TAN1=    0.0293   -0.9996    0.0000
                   KP2=    149  TAN2=   -0.0293    0.9996    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 5 End Guide Fins

LINE CONNECTS KEYPOINTS    207   206
 LINE NO.=    115  KP1=    207  TAN1=    0.0130   -0.9999    0.0000
                   KP2=    206  TAN2=   -0.0130    0.9999    0.0000

LINE CONNECTS KEYPOINTS    212   211
 LINE NO.=    116  KP1=    212  TAN1=    0.0137   -0.9999    0.0000
                   KP2=    211  TAN2=   -0.0137    0.9999    0.0000

LINE CONNECTS KEYPOINTS    150   149
 LINE NO.=    117  KP1=    150  TAN1=    0.9999   -0.0137    0.0000
                   KP2=    149  TAN2=   -0.9999    0.0137    0.0000

LINE CONNECTS KEYPOINTS    144   143
 LINE NO.=    118  KP1=    144  TAN1=    0.9999   -0.0130    0.0000
                   KP2=    143  TAN2=   -0.9999    0.0130    0.0000

LINE CONNECTS KEYPOINTS     24    23
 LINE NO.=    119  KP1=     24  TAN1=    0.9999    0.0130    0.0000
                   KP2=     23  TAN2=   -0.9999   -0.0130    0.0000

LINE CONNECTS KEYPOINTS     30    29
 LINE NO.=    120  KP1=     30  TAN1=    0.9999    0.0137    0.0000
                   KP2=     29  TAN2=   -0.9999   -0.0137    0.0000

LINE CONNECTS KEYPOINTS     96    95
 LINE NO.=    121  KP1=     96  TAN1=    0.0137    0.9999    0.0000
                   KP2=     95  TAN2=   -0.0137   -0.9999    0.0000

LINE CONNECTS KEYPOINTS     90    89
 LINE NO.=    122  KP1=     90  TAN1=    0.0130    0.9999    0.0000
                   KP2=     89  TAN2=   -0.0130   -0.9999    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 line set 6 SS-B Plate Thickness

LINE CONNECTS KEYPOINTS    197   196
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LINE NO.=	123	KP1=	197	TAN1=	0.0000	-1.0000	0.0000
		KP2=	196	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 206 205

LINE NO.=	124	KP1=	206	TAN1=	-0.1483	-0.9889	0.0000
		KP2=	205	TAN2=	0.1483	0.9889	0.0000

LINE CONNECTS KEYPOINTS 211 210

LINE NO.=	125	KP1=	211	TAN1=	0.1483	-0.9889	0.0000
		KP2=	210	TAN2=	-0.1483	0.9889	0.0000

LINE CONNECTS KEYPOINTS 207 212

LINE NO.=	126	KP1=	207	TAN1=	-0.9851	-0.1719	0.0000
		KP2=	212	TAN2=	0.9851	0.1719	0.0000

LINE CONNECTS KEYPOINTS 206 211

LINE NO.=	127	KP1=	206	TAN1=	-1.0000	0.0000	0.0000
		KP2=	211	TAN2=	1.0000	0.0000	0.0000

LINE CONNECTS KEYPOINTS 205 210

LINE NO.=	128	KP1=	205	TAN1=	-1.0000	0.0000	0.0000
		KP2=	210	TAN2=	1.0000	0.0000	0.0000

LINE CONNECTS KEYPOINTS 218 220

LINE NO.=	129	KP1=	218	TAN1=	-0.8616	-0.5076	0.0000
		KP2=	220	TAN2=	0.8616	0.5076	0.0000

LINE CONNECTS KEYPOINTS 220 221

LINE NO.=	130	KP1=	220	TAN1=	-0.8558	-0.5174	0.0000
		KP2=	221	TAN2=	0.8558	0.5174	0.0000

LINE CONNECTS KEYPOINTS 193 192

LINE NO.=	131	KP1=	193	TAN1=	0.0000	-1.0000	0.0000
		KP2=	192	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 204 203

LINE NO.=	132	KP1=	204	TAN1=	0.0000	-1.0000	0.0000
		KP2=	203	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 209 208

LINE NO.=	133	KP1=	209	TAN1=	0.0000	-1.0000	0.0000
		KP2=	208	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 204 209

LINE NO.=	134	KP1=	204	TAN1=	-1.0000	0.0000	0.0000
		KP2=	209	TAN2=	1.0000	0.0000	0.0000

LINE CONNECTS KEYPOINTS 203 208

LINE NO.=	135	KP1=	203	TAN1=	-1.0000	0.0000	0.0000
		KP2=	208	TAN2=	1.0000	0.0000	0.0000

LINE CONNECTS KEYPOINTS 219 159

LINE NO.=	136	KP1=	219	TAN1=	0.0000	-1.0000	0.0000
		KP2=	159	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 162 160

LINE NO.=	137	KP1=	162	TAN1=	0.2873	-0.9578	0.0000
		KP2=	160	TAN2=	-0.2873	0.9578	0.0000

LINE CONNECTS KEYPOINTS 163 161

LINE NO.=	138	KP1=	163	TAN1=	-0.5174	-0.8558	0.0000
		KP2=	161	TAN2=	0.5174	0.8558	0.0000

LINE CONNECTS KEYPOINTS 161 158

LINE NO.=	139	KP1=	161	TAN1=	-0.5076	-0.8616	0.0000
		KP2=	158	TAN2=	0.5076	0.8616	0.0000

LINE CONNECTS KEYPOINTS 219 162

LINE NO.=	140	KP1=	219	TAN1=	-0.9578	0.2873	0.0000
		KP2=	162	TAN2=	0.9578	-0.2873	0.0000

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LINE CONNECTS KEYPOINTS    159   160
 LINE NO.=   141  KP1=     159  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     160  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    189   188
 LINE NO.=   142  KP1=     189  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     188  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   138
 LINE NO.=   143  KP1=     202  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     138  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    145   139
 LINE NO.=   144  KP1=     145  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     139  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    202   145
 LINE NO.=   145  KP1=     202  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     145  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    138   139
 LINE NO.=   146  KP1=     138  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     139  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    146   140
 LINE NO.=   147  KP1=     146  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     140  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    147   141
 LINE NO.=   148  KP1=     147  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     141  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    146   147
 LINE NO.=   149  KP1=     146  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     147  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    140   141
 LINE NO.=   150  KP1=     140  TAN1=   -1.0000    0.0000    0.0000
                  KP2=     141  TAN2=    1.0000    0.0000    0.0000

LINE CONNECTS KEYPOINTS    148   142
 LINE NO.=   151  KP1=     148  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     142  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    149   143
 LINE NO.=   152  KP1=     149  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     143  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS    148   149
 LINE NO.=   153  KP1=     148  TAN1=   -0.9889    0.1483    0.0000
                  KP2=     149  TAN2=    0.9889   -0.1483    0.0000

LINE CONNECTS KEYPOINTS    142   143
 LINE NO.=   154  KP1=     142  TAN1=   -0.9889   -0.1483    0.0000
                  KP2=     143  TAN2=    0.9889    0.1483    0.0000

LINE CONNECTS KEYPOINTS    150   144
 LINE NO.=   155  KP1=     150  TAN1=   -0.1719   -0.9851    0.0000
                  KP2=     144  TAN2=    0.1719    0.9851    0.0000

LINE CONNECTS KEYPOINTS     69    70
 LINE NO.=   156  KP1=      69  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      70  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     18    85
 LINE NO.=   157  KP1=      18  TAN1=    0.0000   -1.0000    0.0000
                  KP2=      85  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     19    25
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 LINE NO.=   158  KP1=     19  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     25  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     18    19
 LINE NO.=   159  KP1=     18  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     19  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     85    25
 LINE NO.=   160  KP1=     85  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     25  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     20    26
 LINE NO.=   161  KP1=     20  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     26  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     21    27
 LINE NO.=   162  KP1=     21  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     27  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     20    21
 LINE NO.=   163  KP1=     20  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     21  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     26    27
 LINE NO.=   164  KP1=     26  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     27  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     22    28
 LINE NO.=   165  KP1=     22  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     28  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     22    23
 LINE NO.=   166  KP1=     22  TAN1=   -0.9889   0.1483   0.0000
                  KP2=     23  TAN2=    0.9889  -0.1483   0.0000

LINE CONNECTS KEYPOINTS     28    29
 LINE NO.=   167  KP1=     28  TAN1=   -0.9889  -0.1483   0.0000
                  KP2=     29  TAN2=    0.9889   0.1483   0.0000

LINE CONNECTS KEYPOINTS     23    29
 LINE NO.=   168  KP1=     23  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     29  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     24    30
 LINE NO.=   169  KP1=     24  TAN1=    0.1719  -0.9851   0.0000
                  KP2=     30  TAN2=   -0.1719   0.9851   0.0000

LINE CONNECTS KEYPOINTS     73    74
 LINE NO.=   170  KP1=     73  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     74  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     86    87
 LINE NO.=   171  KP1=     86  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     87  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     92    93
 LINE NO.=   172  KP1=     92  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     93  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     86    92
 LINE NO.=   173  KP1=     86  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     92  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     87    93
 LINE NO.=   174  KP1=     87  TAN1=   -1.0000   0.0000   0.0000
                  KP2=     93  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     39   106
 LINE NO.=   175  KP1=     39  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    106  TAN2=    0.0000   1.0000   0.0000
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LINE CONNECTS KEYPOINTS     40    42
 LINE NO.=    176  KP1=     40  TAN1=   -0.2873  -0.9578   0.0000
                   KP2=     42  TAN2=    0.2873   0.9578   0.0000

LINE CONNECTS KEYPOINTS     39    40
 LINE NO.=    177  KP1=     39  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     40  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS    106    42
 LINE NO.=    178  KP1=    106  TAN1=   -0.9578  -0.2873   0.0000
                   KP2=     42  TAN2=    0.9578   0.2873   0.0000

LINE CONNECTS KEYPOINTS     38    41
 LINE NO.=    179  KP1=     38  TAN1=    0.5076  -0.8616   0.0000
                   KP2=     41  TAN2=   -0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS     41    43
 LINE NO.=    180  KP1=     41  TAN1=    0.5174  -0.8558   0.0000
                   KP2=     43  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS     77    78
 LINE NO.=    181  KP1=     77  TAN1=    0.0000  -1.0000   0.0000
                   KP2=     78  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     88    89
 LINE NO.=    182  KP1=     88  TAN1=    0.1483  -0.9889   0.0000
                   KP2=     89  TAN2=   -0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     94    95
 LINE NO.=    183  KP1=     94  TAN1=   -0.1483  -0.9889   0.0000
                   KP2=     95  TAN2=    0.1483   0.9889   0.0000

LINE CONNECTS KEYPOINTS     88    94
 LINE NO.=    184  KP1=     88  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     94  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     89    95
 LINE NO.=    185  KP1=     89  TAN1=   -1.0000   0.0000   0.0000
                   KP2=     95  TAN2=    1.0000   0.0000   0.0000

LINE CONNECTS KEYPOINTS     90    96
 LINE NO.=    186  KP1=     90  TAN1=   -0.9851   0.1719   0.0000
                   KP2=     96  TAN2=    0.9851  -0.1719   0.0000

LINE CONNECTS KEYPOINTS    109   107
 LINE NO.=    187  KP1=    109  TAN1=    0.8558  -0.5174   0.0000
                   KP2=    107  TAN2=   -0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    107   104
 LINE NO.=    188  KP1=    107  TAN1=    0.8616  -0.5076   0.0000
                   KP2=    104  TAN2=   -0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    224   225
 LINE NO.=    189  KP1=    224  TAN1=   -0.9851  -0.1719   0.0000
                   KP2=    225  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    230   231
 LINE NO.=    190  KP1=    230  TAN1=   -0.9851  -0.1719   0.0000
                   KP2=    231  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    236   237
 LINE NO.=    191  KP1=    236  TAN1=   -0.9851  -0.1719   0.0000
                   KP2=    237  TAN2=    0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    226   227
 LINE NO.=    192  KP1=    226  TAN1=   -0.8616  -0.5076   0.0000
                   KP2=    227  TAN2=    0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    227   228
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LINE NO.= 193	KP1=	227	TAN1=	-0.8558	-0.5174	0.0000
	KP2=	228	TAN2=	0.8558	0.5174	0.0000
LINE CONNECTS KEYPOINTS		232	233			
LINE NO.= 194	KP1=	232	TAN1=	-0.8616	-0.5076	0.0000
	KP2=	233	TAN2=	0.8616	0.5076	0.0000
LINE CONNECTS KEYPOINTS		233	234			
LINE NO.= 195	KP1=	233	TAN1=	-0.8558	-0.5174	0.0000
	KP2=	234	TAN2=	0.8558	0.5174	0.0000
LINE CONNECTS KEYPOINTS		238	239			
LINE NO.= 196	KP1=	238	TAN1=	-0.8616	-0.5076	0.0000
	KP2=	239	TAN2=	0.8616	0.5076	0.0000
LINE CONNECTS KEYPOINTS		239	240			
LINE NO.= 197	KP1=	239	TAN1=	-0.8558	-0.5174	0.0000
	KP2=	240	TAN2=	0.8558	0.5174	0.0000
LINE CONNECTS KEYPOINTS		171	170			
LINE NO.= 198	KP1=	171	TAN1=	-0.5174	-0.8558	0.0000
	KP2=	170	TAN2=	0.5174	0.8558	0.0000
LINE CONNECTS KEYPOINTS		170	169			
LINE NO.= 199	KP1=	170	TAN1=	-0.5076	-0.8616	0.0000
	KP2=	169	TAN2=	0.5076	0.8616	0.0000
LINE CONNECTS KEYPOINTS		178	177			
LINE NO.= 200	KP1=	178	TAN1=	-0.5174	-0.8558	0.0000
	KP2=	177	TAN2=	0.5174	0.8558	0.0000
LINE CONNECTS KEYPOINTS		177	176			
LINE NO.= 201	KP1=	177	TAN1=	-0.5076	-0.8616	0.0000
	KP2=	176	TAN2=	0.5076	0.8616	0.0000
LINE CONNECTS KEYPOINTS		185	184			
LINE NO.= 202	KP1=	185	TAN1=	-0.5174	-0.8558	0.0000
	KP2=	184	TAN2=	0.5174	0.8558	0.0000
LINE CONNECTS KEYPOINTS		184	183			
LINE NO.= 203	KP1=	184	TAN1=	-0.5076	-0.8616	0.0000
	KP2=	183	TAN2=	0.5076	0.8616	0.0000
LINE CONNECTS KEYPOINTS		168	167			
LINE NO.= 204	KP1=	168	TAN1=	-0.1719	-0.9851	0.0000
	KP2=	167	TAN2=	0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		175	174			
LINE NO.= 205	KP1=	175	TAN1=	-0.1719	-0.9851	0.0000
	KP2=	174	TAN2=	0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		182	181			
LINE NO.= 206	KP1=	182	TAN1=	-0.1719	-0.9851	0.0000
	KP2=	181	TAN2=	0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		47	48			
LINE NO.= 207	KP1=	47	TAN1=	0.1719	-0.9851	0.0000
	KP2=	48	TAN2=	-0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		54	55			
LINE NO.= 208	KP1=	54	TAN1=	0.1719	-0.9851	0.0000
	KP2=	55	TAN2=	-0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		61	62			
LINE NO.= 209	KP1=	61	TAN1=	0.1719	-0.9851	0.0000
	KP2=	62	TAN2=	-0.1719	0.9851	0.0000
LINE CONNECTS KEYPOINTS		49	50			
LINE NO.= 210	KP1=	49	TAN1=	0.5076	-0.8616	0.0000
	KP2=	50	TAN2=	-0.5076	0.8616	0.0000

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LINE CONNECTS KEYPOINTS     50    51
 LINE NO.=    211  KP1=     50  TAN1=    0.5174  -0.8558   0.0000
                   KP2=     51  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS     56    57
 LINE NO.=    212  KP1=     56  TAN1=    0.5076  -0.8616   0.0000
                   KP2=     57  TAN2=   -0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS     57    58
 LINE NO.=    213  KP1=     57  TAN1=    0.5174  -0.8558   0.0000
                   KP2=     58  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS     63    64
 LINE NO.=    214  KP1=     63  TAN1=    0.5076  -0.8616   0.0000
                   KP2=     64  TAN2=   -0.5076   0.8616   0.0000

LINE CONNECTS KEYPOINTS     64    65
 LINE NO.=    215  KP1=     64  TAN1=    0.5174  -0.8558   0.0000
                   KP2=     65  TAN2=   -0.5174   0.8558   0.0000

LINE CONNECTS KEYPOINTS    117   116
 LINE NO.=    216  KP1=    117  TAN1=    0.8558  -0.5174   0.0000
                   KP2=    116  TAN2=   -0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    116   115
 LINE NO.=    217  KP1=    116  TAN1=    0.8616  -0.5076   0.0000
                   KP2=    115  TAN2=   -0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    124   123
 LINE NO.=    218  KP1=    124  TAN1=    0.8558  -0.5174   0.0000
                   KP2=    123  TAN2=   -0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    123   122
 LINE NO.=    219  KP1=    123  TAN1=    0.8616  -0.5076   0.0000
                   KP2=    122  TAN2=   -0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    131   130
 LINE NO.=    220  KP1=    131  TAN1=    0.8558  -0.5174   0.0000
                   KP2=    130  TAN2=   -0.8558   0.5174   0.0000

LINE CONNECTS KEYPOINTS    130   129
 LINE NO.=    221  KP1=    130  TAN1=    0.8616  -0.5076   0.0000
                   KP2=    129  TAN2=   -0.8616   0.5076   0.0000

LINE CONNECTS KEYPOINTS    114   113
 LINE NO.=    222  KP1=    114  TAN1=    0.9851  -0.1719   0.0000
                   KP2=    113  TAN2=   -0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    121   120
 LINE NO.=    223  KP1=    121  TAN1=    0.9851  -0.1719   0.0000
                   KP2=    120  TAN2=   -0.9851   0.1719   0.0000

LINE CONNECTS KEYPOINTS    128   127
 LINE NO.=    224  KP1=    128  TAN1=    0.9851  -0.1719   0.0000
                   KP2=    127  TAN2=   -0.9851   0.1719   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 line set 7 tube thickness

LINE CONNECTS KEYPOINTS    196   195
 LINE NO.=    225  KP1=    196  TAN1=    0.0000  -1.0000   0.0000
                   KP2=    195  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    205   201
 LINE NO.=    226  KP1=    205  TAN1=    0.7071  -0.7071   0.0000
                   KP2=    201  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    204   200
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 LINE NO.=   227  KP1=    204  TAN1=    0.7071   0.7071   0.0000
                  KP2=    200  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    193   194
 LINE NO.=   228  KP1=    193  TAN1=    0.0000   1.0000   0.0000
                  KP2=    194  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    210   215
 LINE NO.=   229  KP1=    210  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    215  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    220   217
 LINE NO.=   230  KP1=    220  TAN1=    0.6103  -0.7922   0.0000
                  KP2=    217  TAN2=   -0.6103   0.7922   0.0000

LINE CONNECTS KEYPOINTS    219   216
 LINE NO.=   231  KP1=    219  TAN1=    0.7071   0.7071   0.0000
                  KP2=    216  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    209   214
 LINE NO.=   232  KP1=    209  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    214  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    192   191
 LINE NO.=   233  KP1=    192  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    191  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    203   199
 LINE NO.=   234  KP1=    203  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    199  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    202   198
 LINE NO.=   235  KP1=    202  TAN1=    0.7071   0.7071   0.0000
                  KP2=    198  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    189   190
 LINE NO.=   236  KP1=    189  TAN1=    0.0000   1.0000   0.0000
                  KP2=    190  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    208   213
 LINE NO.=   237  KP1=    208  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    213  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    159   155
 LINE NO.=   238  KP1=    159  TAN1=    0.7071  -0.7071   0.0000
                  KP2=    155  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    146   152
 LINE NO.=   239  KP1=    146  TAN1=    0.7071   0.7071   0.0000
                  KP2=    152  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    145   151
 LINE NO.=   240  KP1=    145  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    151  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    160   156
 LINE NO.=   241  KP1=    160  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=    156  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    161   157
 LINE NO.=   242  KP1=    161  TAN1=    0.7922  -0.6103   0.0000
                  KP2=    157  TAN2=   -0.7922   0.6103   0.0000

LINE CONNECTS KEYPOINTS    148   154
 LINE NO.=   243  KP1=    148  TAN1=    0.7071   0.7071   0.0000
                  KP2=    154  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    147   153
 LINE NO.=   244  KP1=    147  TAN1=   -0.7071   0.7071   0.0000
                  KP2=    153  TAN2=    0.7071  -0.7071   0.0000
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LINE CONNECTS KEYPOINTS    188   187
 LINE NO.=   245  KP1=     188  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     187  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    138   133
 LINE NO.=   246  KP1=     138  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     133  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     18    13
 LINE NO.=   247  KP1=      18  TAN1=    0.7071   0.7071   0.0000
                  KP2=      13  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     69    68
 LINE NO.=   248  KP1=      69  TAN1=    0.0000   1.0000   0.0000
                  KP2=      68  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    139   134
 LINE NO.=   249  KP1=     139  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     134  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    140   135
 LINE NO.=   250  KP1=     140  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     135  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     20    15
 LINE NO.=   251  KP1=      20  TAN1=    0.7071   0.7071   0.0000
                  KP2=      15  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     19    14
 LINE NO.=   252  KP1=      19  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      14  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS    141   136
 LINE NO.=   253  KP1=     141  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=     136  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS    142   137
 LINE NO.=   254  KP1=     142  TAN1=    0.7071  -0.7071   0.0000
                  KP2=     137  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     22    17
 LINE NO.=   255  KP1=      22  TAN1=    0.7071   0.7071   0.0000
                  KP2=      17  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     21    16
 LINE NO.=   256  KP1=      21  TAN1=   -0.7071   0.7071   0.0000
                  KP2=      16  TAN2=    0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     70    71
 LINE NO.=   257  KP1=      70  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      71  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     85    80
 LINE NO.=   258  KP1=      85  TAN1=    0.7071  -0.7071   0.0000
                  KP2=      80  TAN2=   -0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     86    81
 LINE NO.=   259  KP1=      86  TAN1=    0.7071   0.7071   0.0000
                  KP2=      81  TAN2=   -0.7071  -0.7071   0.0000

LINE CONNECTS KEYPOINTS     73    72
 LINE NO.=   260  KP1=      73  TAN1=    0.0000   1.0000   0.0000
                  KP2=      72  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS     25    31
 LINE NO.=   261  KP1=      25  TAN1=   -0.7071  -0.7071   0.0000
                  KP2=      31  TAN2=    0.7071   0.7071   0.0000

LINE CONNECTS KEYPOINTS     26    32
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 LINE NO.=   262  KP1=     26  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     32  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     39    35
 LINE NO.=   263  KP1=     39  TAN1=    0.7071    0.7071    0.0000
                  KP2=     35  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     92    98
 LINE NO.=   264  KP1=     92  TAN1=   -0.7071    0.7071    0.0000
                  KP2=     98  TAN2=    0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     27    33
 LINE NO.=   265  KP1=     27  TAN1=   -0.7071   -0.7071    0.0000
                  KP2=     33  TAN2=    0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     28    34
 LINE NO.=   266  KP1=     28  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     34  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     41    37
 LINE NO.=   267  KP1=     41  TAN1=    0.7922    0.6103    0.0000
                  KP2=     37  TAN2=   -0.7922   -0.6103    0.0000

LINE CONNECTS KEYPOINTS     40    36
 LINE NO.=   268  KP1=     40  TAN1=   -0.7071    0.7071    0.0000
                  KP2=     36  TAN2=    0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     74    75
 LINE NO.=   269  KP1=     74  TAN1=    0.0000   -1.0000    0.0000
                  KP2=     75  TAN2=    0.0000    1.0000    0.0000

LINE CONNECTS KEYPOINTS     87    82
 LINE NO.=   270  KP1=     87  TAN1=    0.7071   -0.7071    0.0000
                  KP2=     82  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS     88    83
 LINE NO.=   271  KP1=     88  TAN1=    0.7071    0.7071    0.0000
                  KP2=     83  TAN2=   -0.7071   -0.7071    0.0000

LINE CONNECTS KEYPOINTS     77    76
 LINE NO.=   272  KP1=     77  TAN1=    0.0000    1.0000    0.0000
                  KP2=     76  TAN2=    0.0000   -1.0000    0.0000

LINE CONNECTS KEYPOINTS     93    99
 LINE NO.=   273  KP1=     93  TAN1=   -0.7071   -0.7071    0.0000
                  KP2=     99  TAN2=    0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS    106   102
 LINE NO.=   274  KP1=    106  TAN1=    0.7071   -0.7071    0.0000
                  KP2=    102  TAN2=   -0.7071    0.7071    0.0000

LINE CONNECTS KEYPOINTS    107   103
 LINE NO.=   275  KP1=    107  TAN1=    0.6103    0.7922    0.0000
                  KP2=    103  TAN2=   -0.6103   -0.7922    0.0000

LINE CONNECTS KEYPOINTS     94   100
 LINE NO.=   276  KP1=     94  TAN1=   -0.7071    0.7071    0.0000
                  KP2=    100  TAN2=    0.7071   -0.7071    0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     1,  SPACING RATIO =    1.000

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 line set 8, arc 1 bottom

LINE CONNECTS KEYPOINTS    222   207
 LINE NO.=   277  KP1=    222  TAN1=   -1.0000    0.0000    0.0000
                  KP2=    207  TAN2=    0.9857    0.1684    0.0000

LINE CONNECTS KEYPOINTS    223   224
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 LINE NO.=   278  KP1=    223  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    224  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS    229   230
 LINE NO.=   279  KP1=    229  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    230  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS    235   236
 LINE NO.=   280  KP1=    235  TAN1=   -1.0000   0.0000   0.0000
                  KP2=    236  TAN2=    0.9857   0.1684   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 9, arc 2 side arcs

LINE CONNECTS KEYPOINTS    212   218
 LINE NO.=   281  KP1=    212  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    218  TAN2=    0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS    225   226
 LINE NO.=   282  KP1=    225  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    226  TAN2=    0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS    231   232
 LINE NO.=   283  KP1=    231  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    232  TAN2=    0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS    237   238
 LINE NO.=   284  KP1=    237  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=    238  TAN2=    0.8652   0.5015   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 10, arc 3 side arcs

LINE CONNECTS KEYPOINTS    221   163
 LINE NO.=   285  KP1=    221  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    163  TAN2=    0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    228   171
 LINE NO.=   286  KP1=    228  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    171  TAN2=    0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    234   178
 LINE NO.=   287  KP1=    234  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    178  TAN2=    0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    240   185
 LINE NO.=   288  KP1=    240  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=    185  TAN2=    0.5209   0.8536   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 11, arc 4 side arcs

LINE CONNECTS KEYPOINTS    158   150
 LINE NO.=   289  KP1=    158  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    150  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    169   168
 LINE NO.=   290  KP1=    169  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    168  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    176   175
 LINE NO.=   291  KP1=    176  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    175  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    183   182
 LINE NO.=   292  KP1=    183  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=    182  TAN2=    0.1755   0.9845   0.0000
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SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 12, arc 5 side arcs

LINE CONNECTS KEYPOINTS    144    24
 LINE NO.=   293  KP1=    144  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     24  TAN2=   -0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    167    47
 LINE NO.=   294  KP1=    167  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     47  TAN2=   -0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    174    54
 LINE NO.=   295  KP1=    174  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     54  TAN2=   -0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    181    61
 LINE NO.=   296  KP1=    181  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     61  TAN2=   -0.1684   0.9857   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 13, arc 6 side arcs

LINE CONNECTS KEYPOINTS     30    38
 LINE NO.=   297  KP1=     30  TAN1=    0.1755  -0.9845   0.0000
                  KP2=     38  TAN2=   -0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS     48    49
 LINE NO.=   298  KP1=     48  TAN1=    0.1755  -0.9845   0.0000
                  KP2=     49  TAN2=   -0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS     55    56
 LINE NO.=   299  KP1=     55  TAN1=    0.1755  -0.9845   0.0000
                  KP2=     56  TAN2=   -0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS     62    63
 LINE NO.=   300  KP1=     62  TAN1=    0.1755  -0.9845   0.0000
                  KP2=     63  TAN2=   -0.5015   0.8652   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 14, arc 7 side arcs

LINE CONNECTS KEYPOINTS     43   109
 LINE NO.=   301  KP1=     43  TAN1=    0.5209  -0.8536   0.0000
                  KP2=    109  TAN2=   -0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS     51   117
 LINE NO.=   302  KP1=     51  TAN1=    0.5209  -0.8536   0.0000
                  KP2=    117  TAN2=   -0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS     58   124
 LINE NO.=   303  KP1=     58  TAN1=    0.5209  -0.8536   0.0000
                  KP2=    124  TAN2=   -0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS     65   131
 LINE NO.=   304  KP1=     65  TAN1=    0.5209  -0.8536   0.0000
                  KP2=    131  TAN2=   -0.8536   0.5209   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 15, arc 8 side arcs

LINE CONNECTS KEYPOINTS    104    96
 LINE NO.=   305  KP1=    104  TAN1=    0.8652  -0.5015   0.0000
                  KP2=     96  TAN2=   -0.9845   0.1755   0.0000

LINE CONNECTS KEYPOINTS    115   114
```

```
 LINE NO.=   306 KP1=    115 TAN1=    0.8652 -0.5015   0.0000
                 KP2=    114 TAN2=   -0.9845  0.1755   0.0000

LINE CONNECTS KEYPOINTS    122   121
 LINE NO.=   307 KP1=    122 TAN1=    0.8652 -0.5015   0.0000
                 KP2=    121 TAN2=   -0.9845  0.1755   0.0000

LINE CONNECTS KEYPOINTS    129   128
 LINE NO.=   308 KP1=    129 TAN1=    0.8652 -0.5015   0.0000
                 KP2=    128 TAN2=   -0.9845  0.1755   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 line set 16, arc 9 top arcs

LINE CONNECTS KEYPOINTS     90   110
 LINE NO.=   309 KP1=     90 TAN1=    0.9857 -0.1684   0.0000
                 KP2=    110 TAN2=   -1.0000  0.0000   0.0000

LINE CONNECTS KEYPOINTS    113   112
 LINE NO.=   310 KP1=    113 TAN1=    0.9857 -0.1684   0.0000
                 KP2=    112 TAN2=   -1.0000  0.0000   0.0000

LINE CONNECTS KEYPOINTS    120   119
 LINE NO.=   311 KP1=    120 TAN1=    0.9857 -0.1684   0.0000
                 KP2=    119 TAN2=   -1.0000  0.0000   0.0000

LINE CONNECTS KEYPOINTS    127   126
 LINE NO.=   312 KP1=    127 TAN1=    0.9857 -0.1684   0.0000
                 KP2=    126 TAN2=   -1.0000  0.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)
 line set 17 IB thickness

LINE CONNECTS KEYPOINTS    222   223
 LINE NO.=   313 KP1=    222 TAN1=    0.0000  1.0000   0.0000
                 KP2=    223 TAN2=    0.0000 -1.0000   0.0000

LINE CONNECTS KEYPOINTS    207   224
 LINE NO.=   314 KP1=    207 TAN1=   -0.1684  0.9857   0.0000
                 KP2=    224 TAN2=    0.1684 -0.9857   0.0000

LINE CONNECTS KEYPOINTS    212   225
 LINE NO.=   315 KP1=    212 TAN1=   -0.1755  0.9845   0.0000
                 KP2=    225 TAN2=    0.1755 -0.9845   0.0000

LINE CONNECTS KEYPOINTS    218   226
 LINE NO.=   316 KP1=    218 TAN1=   -0.5015  0.8652   0.0000
                 KP2=    226 TAN2=    0.5015 -0.8652   0.0000

LINE CONNECTS KEYPOINTS    220   227
 LINE NO.=   317 KP1=    220 TAN1=   -0.5138  0.8579   0.0000
                 KP2=    227 TAN2=    0.5138 -0.8579   0.0000

LINE CONNECTS KEYPOINTS    221   228
 LINE NO.=   318 KP1=    221 TAN1=   -0.5209  0.8536   0.0000
                 KP2=    228 TAN2=    0.5209 -0.8536   0.0000

LINE CONNECTS KEYPOINTS    163   171
 LINE NO.=   319 KP1=    163 TAN1=   -0.8536  0.5209   0.0000
                 KP2=    171 TAN2=    0.8536 -0.5209   0.0000

LINE CONNECTS KEYPOINTS    161   170
 LINE NO.=   320 KP1=    161 TAN1=   -0.8579  0.5138   0.0000
                 KP2=    170 TAN2=    0.8579 -0.5138   0.0000

LINE CONNECTS KEYPOINTS    158   169
```

```
 LINE NO.=   321  KP1=    158  TAN1=  -0.8652   0.5015   0.0000
                  KP2=    169  TAN2=   0.8652  -0.5015   0.0000

 LINE CONNECTS KEYPOINTS    150   168
  LINE NO.=   322  KP1=    150  TAN1=  -0.9845   0.1755   0.0000
                  KP2=    168  TAN2=   0.9845  -0.1755   0.0000

 LINE CONNECTS KEYPOINTS    144   167
  LINE NO.=   323  KP1=    144  TAN1=  -0.9857   0.1684   0.0000
                  KP2=    167  TAN2=   0.9857  -0.1684   0.0000

 LINE CONNECTS KEYPOINTS     24    47
  LINE NO.=   324  KP1=     24  TAN1=  -0.9857  -0.1684   0.0000
                  KP2=     47  TAN2=   0.9857   0.1684   0.0000

 LINE CONNECTS KEYPOINTS     30    48
  LINE NO.=   325  KP1=     30  TAN1=  -0.9845  -0.1755   0.0000
                  KP2=     48  TAN2=   0.9845   0.1755   0.0000

 LINE CONNECTS KEYPOINTS     38    49
  LINE NO.=   326  KP1=     38  TAN1=  -0.8652  -0.5015   0.0000
                  KP2=     49  TAN2=   0.8652   0.5015   0.0000

 LINE CONNECTS KEYPOINTS     41    50
  LINE NO.=   327  KP1=     41  TAN1=  -0.8579  -0.5138   0.0000
                  KP2=     50  TAN2=   0.8579   0.5138   0.0000

 LINE CONNECTS KEYPOINTS     43    51
  LINE NO.=   328  KP1=     43  TAN1=  -0.8536  -0.5209   0.0000
                  KP2=     51  TAN2=   0.8536   0.5209   0.0000

 LINE CONNECTS KEYPOINTS    109   117
  LINE NO.=   329  KP1=    109  TAN1=  -0.5209  -0.8536   0.0000
                  KP2=    117  TAN2=   0.5209   0.8536   0.0000

 LINE CONNECTS KEYPOINTS    107   116
  LINE NO.=   330  KP1=    107  TAN1=  -0.5138  -0.8579   0.0000
                  KP2=    116  TAN2=   0.5138   0.8579   0.0000

 LINE CONNECTS KEYPOINTS    104   115
  LINE NO.=   331  KP1=    104  TAN1=  -0.5015  -0.8652   0.0000
                  KP2=    115  TAN2=   0.5015   0.8652   0.0000

 LINE CONNECTS KEYPOINTS     96   114
  LINE NO.=   332  KP1=     96  TAN1=  -0.1755  -0.9845   0.0000
                  KP2=    114  TAN2=   0.1755   0.9845   0.0000

 LINE CONNECTS KEYPOINTS     90   113
  LINE NO.=   333  KP1=     90  TAN1=  -0.1684  -0.9857   0.0000
                  KP2=    113  TAN2=   0.1684   0.9857   0.0000

 LINE CONNECTS KEYPOINTS    110   112
  LINE NO.=   334  KP1=    110  TAN1=   0.0000  -1.0000   0.0000
                  KP2=    112  TAN2=   0.0000   1.0000   0.0000

 SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =   1.000
 line set 18 OB inner thickness

 LINE CONNECTS KEYPOINTS    223   229
  LINE NO.=   335  KP1=    223  TAN1=   0.0000   1.0000   0.0000
                  KP2=    229  TAN2=   0.0000  -1.0000   0.0000

 LINE CONNECTS KEYPOINTS    224   230
  LINE NO.=   336  KP1=    224  TAN1=  -0.1684   0.9857   0.0000
                  KP2=    230  TAN2=   0.1684  -0.9857   0.0000

 LINE CONNECTS KEYPOINTS    225   231
  LINE NO.=   337  KP1=    225  TAN1=  -0.1755   0.9845   0.0000
                  KP2=    231  TAN2=   0.1755  -0.9845   0.0000
```

```
LINE CONNECTS KEYPOINTS    226   232
 LINE NO.=   338  KP1=     226  TAN1=   -0.5015   0.8652   0.0000
                  KP2=     232  TAN2=    0.5015  -0.8652   0.0000

LINE CONNECTS KEYPOINTS    227   233
 LINE NO.=   339  KP1=     227  TAN1=   -0.5138   0.8579   0.0000
                  KP2=     233  TAN2=    0.5138  -0.8579   0.0000

LINE CONNECTS KEYPOINTS    228   234
 LINE NO.=   340  KP1=     228  TAN1=   -0.5209   0.8536   0.0000
                  KP2=     234  TAN2=    0.5209  -0.8536   0.0000

LINE CONNECTS KEYPOINTS    171   178
 LINE NO.=   341  KP1=     171  TAN1=   -0.8536   0.5209   0.0000
                  KP2=     178  TAN2=    0.8536  -0.5209   0.0000

LINE CONNECTS KEYPOINTS    170   177
 LINE NO.=   342  KP1=     170  TAN1=   -0.8579   0.5138   0.0000
                  KP2=     177  TAN2=    0.8579  -0.5138   0.0000

LINE CONNECTS KEYPOINTS    169   176
 LINE NO.=   343  KP1=     169  TAN1=   -0.8652   0.5015   0.0000
                  KP2=     176  TAN2=    0.8652  -0.5015   0.0000

LINE CONNECTS KEYPOINTS    168   175
 LINE NO.=   344  KP1=     168  TAN1=   -0.9845   0.1755   0.0000
                  KP2=     175  TAN2=    0.9845  -0.1755   0.0000

LINE CONNECTS KEYPOINTS    167   174
 LINE NO.=   345  KP1=     167  TAN1=   -0.9857   0.1684   0.0000
                  KP2=     174  TAN2=    0.9857  -0.1684   0.0000

LINE CONNECTS KEYPOINTS     47    54
 LINE NO.=   346  KP1=      47  TAN1=   -0.9857  -0.1684   0.0000
                  KP2=      54  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS     48    55
 LINE NO.=   347  KP1=      48  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=      55  TAN2=    0.9845   0.1755   0.0000

LINE CONNECTS KEYPOINTS     49    56
 LINE NO.=   348  KP1=      49  TAN1=   -0.8652  -0.5015   0.0000
                  KP2=      56  TAN2=    0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS     50    57
 LINE NO.=   349  KP1=      50  TAN1=   -0.8579  -0.5138   0.0000
                  KP2=      57  TAN2=    0.8579   0.5138   0.0000

LINE CONNECTS KEYPOINTS     51    58
 LINE NO.=   350  KP1=      51  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=      58  TAN2=    0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS    117   124
 LINE NO.=   351  KP1=     117  TAN1=   -0.5209  -0.8536   0.0000
                  KP2=     124  TAN2=    0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    116   123
 LINE NO.=   352  KP1=     116  TAN1=   -0.5138  -0.8579   0.0000
                  KP2=     123  TAN2=    0.5138   0.8579   0.0000

LINE CONNECTS KEYPOINTS    115   122
 LINE NO.=   353  KP1=     115  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=     122  TAN2=    0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS    114   121
 LINE NO.=   354  KP1=     114  TAN1=   -0.1755  -0.9845   0.0000
                  KP2=     121  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    113   120
```

```
 LINE NO.=   355  KP1=    113  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=    120  TAN2=    0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    112   119
 LINE NO.=   356  KP1=    112  TAN1=    0.0000  -1.0000   0.0000
                  KP2=    119  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =   1.000
 line set 19 skirt thickness

LINE CONNECTS KEYPOINTS    229   235
 LINE NO.=   357  KP1=    229  TAN1=    0.0000   1.0000   0.0000
                  KP2=    235  TAN2=    0.0000  -1.0000   0.0000

LINE CONNECTS KEYPOINTS    230   236
 LINE NO.=   358  KP1=    230  TAN1=   -0.1684   0.9857   0.0000
                  KP2=    236  TAN2=    0.1684  -0.9857   0.0000

LINE CONNECTS KEYPOINTS    231   237
 LINE NO.=   359  KP1=    231  TAN1=   -0.1755   0.9845   0.0000
                  KP2=    237  TAN2=    0.1755  -0.9845   0.0000

LINE CONNECTS KEYPOINTS    232   238
 LINE NO.=   360  KP1=    232  TAN1=   -0.5015   0.8652   0.0000
                  KP2=    238  TAN2=    0.5015  -0.8652   0.0000

LINE CONNECTS KEYPOINTS    233   239
 LINE NO.=   361  KP1=    233  TAN1=   -0.5138   0.8579   0.0000
                  KP2=    239  TAN2=    0.5138  -0.8579   0.0000

LINE CONNECTS KEYPOINTS    234   240
 LINE NO.=   362  KP1=    234  TAN1=   -0.5209   0.8536   0.0000
                  KP2=    240  TAN2=    0.5209  -0.8536   0.0000

LINE CONNECTS KEYPOINTS    178   185
 LINE NO.=   363  KP1=    178  TAN1=   -0.8536   0.5209   0.0000
                  KP2=    185  TAN2=    0.8536  -0.5209   0.0000

LINE CONNECTS KEYPOINTS    177   184
 LINE NO.=   364  KP1=    177  TAN1=   -0.8579   0.5138   0.0000
                  KP2=    184  TAN2=    0.8579  -0.5138   0.0000

LINE CONNECTS KEYPOINTS    176   183
 LINE NO.=   365  KP1=    176  TAN1=   -0.8652   0.5015   0.0000
                  KP2=    183  TAN2=    0.8652  -0.5015   0.0000

LINE CONNECTS KEYPOINTS    175   182
 LINE NO.=   366  KP1=    175  TAN1=   -0.9845   0.1755   0.0000
                  KP2=    182  TAN2=    0.9845  -0.1755   0.0000

LINE CONNECTS KEYPOINTS    174   181
 LINE NO.=   367  KP1=    174  TAN1=   -0.9857   0.1684   0.0000
                  KP2=    181  TAN2=    0.9857  -0.1684   0.0000

LINE CONNECTS KEYPOINTS     54    61
 LINE NO.=   368  KP1=     54  TAN1=   -0.9857  -0.1684   0.0000
                  KP2=     61  TAN2=    0.9857   0.1684   0.0000

LINE CONNECTS KEYPOINTS     55    62
 LINE NO.=   369  KP1=     55  TAN1=   -0.9845  -0.1755   0.0000
                  KP2=     62  TAN2=    0.9845   0.1755   0.0000

LINE CONNECTS KEYPOINTS     56    63
 LINE NO.=   370  KP1=     56  TAN1=   -0.8652  -0.5015   0.0000
                  KP2=     63  TAN2=    0.8652   0.5015   0.0000

LINE CONNECTS KEYPOINTS     57    64
 LINE NO.=   371  KP1=     57  TAN1=   -0.8579  -0.5138   0.0000
                  KP2=     64  TAN2=    0.8579   0.5138   0.0000
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```
LINE CONNECTS KEYPOINTS     58    65
 LINE NO.=   372  KP1=      58  TAN1=   -0.8536  -0.5209   0.0000
                  KP2=      65  TAN2=    0.8536   0.5209   0.0000

LINE CONNECTS KEYPOINTS    124   131
 LINE NO.=   373  KP1=     124  TAN1=   -0.5209  -0.8536   0.0000
                  KP2=     131  TAN2=    0.5209   0.8536   0.0000

LINE CONNECTS KEYPOINTS    123   130
 LINE NO.=   374  KP1=     123  TAN1=   -0.5138  -0.8579   0.0000
                  KP2=     130  TAN2=    0.5138   0.8579   0.0000

LINE CONNECTS KEYPOINTS    122   129
 LINE NO.=   375  KP1=     122  TAN1=   -0.5015  -0.8652   0.0000
                  KP2=     129  TAN2=    0.5015   0.8652   0.0000

LINE CONNECTS KEYPOINTS    121   128
 LINE NO.=   376  KP1=     121  TAN1=   -0.1755  -0.9845   0.0000
                  KP2=     128  TAN2=    0.1755   0.9845   0.0000

LINE CONNECTS KEYPOINTS    120   127
 LINE NO.=   377  KP1=     120  TAN1=   -0.1684  -0.9857   0.0000
                  KP2=     127  TAN2=    0.1684   0.9857   0.0000

LINE CONNECTS KEYPOINTS    119   126
 LINE NO.=   378  KP1=     119  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     126  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     2,  SPACING RATIO =    1.000
 lines to fill in lids
 lines tube height

LINE CONNECTS KEYPOINTS    195   194
 LINE NO.=   379  KP1=     195  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     194  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    191   190
 LINE NO.=   380  KP1=     191  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     190  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    187    68
 LINE NO.=   381  KP1=     187  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      68  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     71    72
 LINE NO.=   382  KP1=      71  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      72  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     75    76
 LINE NO.=   383  KP1=      75  TAN1=    0.0000  -1.0000   0.0000
                  KP2=      76  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 end lines

LINE CONNECTS KEYPOINTS    222   197
 LINE NO.=   384  KP1=     222  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     197  TAN2=    0.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS     78   110
 LINE NO.=   385  KP1=      78  TAN1=    0.0000  -1.0000   0.0000
                  KP2=     110  TAN2=    0.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =     4,  SPACING RATIO =    1.000
 area set 1, tubes
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    195   196   205   201

    AREA NUMBER =      1

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    200   201   205   204

    AREA NUMBER =      2

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    193   194   200   204

    AREA NUMBER =      3

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    191   192   203   199

    AREA NUMBER =      4

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    198   199   203   202

    AREA NUMBER =      5

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    189   190   198   202

    AREA NUMBER =      6

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    187   188   138   133

    AREA NUMBER =      7

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    133   138    18    13

    AREA NUMBER =      8

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     69    68    13    18

    AREA NUMBER =      9

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     71    70    85    80

    AREA NUMBER =      10

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     80    85    86    81

    AREA NUMBER =      11

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     73    72    81    86

    AREA NUMBER =      12

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     75    74    87    82

    AREA NUMBER =      13

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     82    87    88    83

    AREA NUMBER =      14
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     77    76    83    88

    AREA NUMBER =     15

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   210   215   214

    AREA NUMBER =     16

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    215   210   220   217

    AREA NUMBER =     17

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    216   217   220   219

    AREA NUMBER =     18

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    209   214   216   219

    AREA NUMBER =     19

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   208   213   151

    AREA NUMBER =     20

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    213   208   159   155

    AREA NUMBER =     21

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    152   155   159   146

    AREA NUMBER =     22

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    145   151   152   146

    AREA NUMBER =     23

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    134   139   140   135

    AREA NUMBER =     24

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    135   140    20    15

    AREA NUMBER =     25

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19    14    15    20

    AREA NUMBER =     26

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     19   139   134    14

    AREA NUMBER =     27

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    25    31    98

    AREA NUMBER =     28
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DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     31    25    26    32

    AREA NUMBER =     29

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     32    26    39    35

    AREA NUMBER =     30

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     92    98    35    39

    AREA NUMBER =     31

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94    93    99   100

    AREA NUMBER =     32

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     99    93   106   102

    AREA NUMBER =     33

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    102   106   107   103

    AREA NUMBER =     34

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     94   100   103   107

    AREA NUMBER =     35

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    156   160   161   157

    AREA NUMBER =     36

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    157   161   148   154

    AREA NUMBER =     37

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   153   154   148

    AREA NUMBER =     38

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    147   160   156   153

    AREA NUMBER =     39

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    136   141   142   137

    AREA NUMBER =     40

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    137   142    22    17

    AREA NUMBER =     41

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21    16    17    22

    AREA NUMBER =     42
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     21   141   136    16

    AREA NUMBER =     43

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     33    27    28    34

    AREA NUMBER =     44

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     34    28    41    37

    AREA NUMBER =     45

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    36    37    41

    AREA NUMBER =     46

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     40    27    33    36

    AREA NUMBER =     47
 area set 2, plates

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    204   205   210   209

    AREA NUMBER =     48

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    192   193   204   203

    AREA NUMBER =     49

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    203   204   209   208

    AREA NUMBER =     50

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    208   209   219   159

    AREA NUMBER =     51

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    202   203   208   145

    AREA NUMBER =     52

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    146   159   160   147

    AREA NUMBER =     53

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    188   189   202   138

    AREA NUMBER =     54

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    138   202   145   139

    AREA NUMBER =     55

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    139   145   146   140

    AREA NUMBER =     56
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    140   146   147   141

    AREA NUMBER =     57

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    141   147   148   142

    AREA NUMBER =     58

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     18   138   139    19

    AREA NUMBER =     59

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     20   140   141    21

    AREA NUMBER =     60

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     70    69    18    85

    AREA NUMBER =     61

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     85    18    19    25

    AREA NUMBER =     62

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     25    19    20    26

    AREA NUMBER =     63

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     26    20    21    27

    AREA NUMBER =     64

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     27    21    22    28

    AREA NUMBER =     65

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     86    85    25    92

    AREA NUMBER =     66

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     39    26    27    40

    AREA NUMBER =     67

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     74    73    86    87

    AREA NUMBER =     68

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     87    86    92    93

    AREA NUMBER =     69

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     93    92    39   106

    AREA NUMBER =     70
```

```
 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     88     87     93     94

     AREA NUMBER =      71
  area set 3, end guides

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    196    197    206    205

     AREA NUMBER =      72

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    205    206    211    210

     AREA NUMBER =      73

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    206    207    212    211

     AREA NUMBER =      74

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    210    211    218    220

     AREA NUMBER =      75

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    148    161    158    149

     AREA NUMBER =      76

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    142    148    149    143

     AREA NUMBER =      77

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =    143    149    150    144

     AREA NUMBER =      78

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     22    142    143     23

     AREA NUMBER =      79

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     28     22     23     29

     AREA NUMBER =      80

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     29     23     24     30

     AREA NUMBER =      81

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     41     28     29     38

     AREA NUMBER =      82

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     95     94    107    104

     AREA NUMBER =      83

 DEFINE AREA BY LIST OF KEYPOINTS
   KEYPOINT LIST =     89     88     94     95
```

```
    AREA NUMBER =     84

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    89    95    96

    AREA NUMBER =     85

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     78    77    88    89

    AREA NUMBER =     86
 area set 4, corner guides

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    219   220   221   152

    AREA NUMBER =     87

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    159   219   162   150

    AREA NUMBER =     88

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    160   162   163   151

    AREA NUMBER =     89

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   106    42   109

    AREA NUMBER =     90

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    106    39    40    42

    AREA NUMBER =     91

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     42    40    41    43

    AREA NUMBER =     92

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)
 area set 5, inner barrier

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    222   223   224   207

    AREA NUMBER =     93

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    207   224   225   212

    AREA NUMBER =     94

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    212   225   226   218

    AREA NUMBER =     95

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    218   226   227   220

    AREA NUMBER =     96

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    220   227   228   221

    AREA NUMBER =     97
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    221   228   171   163

    AREA NUMBER =     98

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    163   171   170   161

    AREA NUMBER =     99

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    161   170   169   158

    AREA NUMBER =    100

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    158   169   168   150

    AREA NUMBER =    101

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    150   168   167   144

    AREA NUMBER =    102

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    144   167    47    24

    AREA NUMBER =    103

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     24    47    48    30

    AREA NUMBER =    104

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     30    48    49    38

    AREA NUMBER =    105

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     38    49    50    41

    AREA NUMBER =    106

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     41    50    51    43

    AREA NUMBER =    107

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     43    51   117   109

    AREA NUMBER =    108

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    109   117   116   107

    AREA NUMBER =    109

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    107   116   115   104

    AREA NUMBER =    110

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =    104   115   114    96

    AREA NUMBER =    111
```

```
DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90    96   114   113

    AREA NUMBER =    112

DEFINE AREA BY LIST OF KEYPOINTS
  KEYPOINT LIST =     90   113   112   110

    AREA NUMBER =    113
 area set 6, outer barrier

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         1,

*** WARNING ***                         CP=      4.990   TIME= 20:53:46
Area 1 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.990   TIME= 20:53:46
Area 2 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      4.990   TIME= 20:53:46
Area 3 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 4 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 5 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 6 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 7 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 8 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 9 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 10 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 11 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 12 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 13 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 14 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.000   TIME= 20:53:46
Area 15 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 16 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 17 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
```

```
Area 18 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 19 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 20 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 21 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 22 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 23 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 24 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 25 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 26 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.010   TIME= 20:53:46
Area 27 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 28 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 29 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 30 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 31 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 32 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 33 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 34 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 35 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 36 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 37 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.020   TIME= 20:53:46
Area 38 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 39 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 40 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 41 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 42 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 43 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 44 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 45 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 46 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 47 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 48 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 49 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.030   TIME= 20:53:46
Area 50 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 51 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 52 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 53 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 54 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 55 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 56 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 57 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 58 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 59 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 60 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 61 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.040   TIME= 20:53:46
Area 62 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.050   TIME= 20:53:46
Area 63 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.050   TIME= 20:53:46
Area 64 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 65 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 66 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 67 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 68 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 69 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 70 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 71 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 72 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 73 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.050   TIME= 20:53:46
Area 74 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 75 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 76 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 77 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 78 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 79 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 80 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 81 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 82 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 83 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 84 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 85 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.060   TIME= 20:53:46
Area 86 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.070   TIME= 20:53:46
Area 87 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=      5.070   TIME= 20:53:46
```

```
Area 88 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 89 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 90 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 91 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 92 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 93 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 94 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 95 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 96 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.070   TIME= 20:53:46
Area 97 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 98 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 99 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 100 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 101 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 102 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 103 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 104 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 105 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 106 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 107 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.080   TIME= 20:53:46
Area 108 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 20:53:46
Area 109 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 20:53:46
Area 110 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 20:53:46
Area 111 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=      5.090   TIME= 20:53:46
Area 112 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      5.090   TIME= 20:53:46
Area 113 is not meshed.  Volume will be generated without elements.

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2875     AND   2.2875
  KABS=  0.  TOLERANCE= 0.114375E-01

  113  AREAS (OF   509  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

    21  AREAS (OF    509  DEFINED) SELECTED BY ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

DRAG ALL SELECTED AREAS
     ALONG LINES
         2,

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 441 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 444 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 448 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 451 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 454 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 458 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 461 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 464 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.380   TIME= 20:54:01
Area 468 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 471 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 475 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 478 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 482 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 485 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 488 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 492 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 495 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 498 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 502 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 505 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     11.390   TIME= 20:54:01
Area 509 is not meshed.  Volume will be generated without elements.
 copy areas from top of basket to bottom of lid

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.2775     AND   2.2775
  KABS=  0.  TOLERANCE= 0.113875E-01

  113  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.68095
  KABS=  0.  TOLERANCE= 0.000000E+00

   92  AREAS (OF   594  DEFINED) SELECTED BY  ASEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

GENERATE    2 TOTAL SETS OF AREAS
  SET IS ALL SELECTED AREAS
  DX,DY,DZ=   0.000E+00   0.000E+00   0.100E-01       CSYS=  0

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF  0.10000E-03
KEYPOINT    373 USED FOR KEYPOINT(S)     521
KEYPOINT    375 USED FOR KEYPOINT(S)     522
KEYPOINT    377 USED FOR KEYPOINT(S)     523
KEYPOINT    379 USED FOR KEYPOINT(S)     458
KEYPOINT    381 USED FOR KEYPOINT(S)     540
KEYPOINT    383 USED FOR KEYPOINT(S)     542
KEYPOINT    385 USED FOR KEYPOINT(S)     496
KEYPOINT    387 USED FOR KEYPOINT(S)     524
KEYPOINT    389 USED FOR KEYPOINT(S)     527
KEYPOINT    391 USED FOR KEYPOINT(S)     528
KEYPOINT    393 USED FOR KEYPOINT(S)     531
KEYPOINT    395 USED FOR KEYPOINT(S)     532
KEYPOINT    397 USED FOR KEYPOINT(S)     533
KEYPOINT    399 USED FOR KEYPOINT(S)     514
KEYPOINT    401 USED FOR KEYPOINT(S)     545
KEYPOINT    403 USED FOR KEYPOINT(S)     544
KEYPOINT    405 USED FOR KEYPOINT(S)     492
KEYPOINT    407 USED FOR KEYPOINT(S)     535
KEYPOINT    409 USED FOR KEYPOINT(S)     538
KEYPOINT    410 USED FOR KEYPOINT(S)     537
LINE     837 USED FOR LINE(S)   1121
LINE     847 USED FOR LINE(S)   1124
LINE     852 USED FOR LINE(S)   1152
LINE     862 USED FOR LINE(S)   1157
LINE     867 USED FOR LINE(S)   1125
LINE     877 USED FOR LINE(S)   1131
LINE     887 USED FOR LINE(S)   1138
LINE     897 USED FOR LINE(S)   1141
LINE     902 USED FOR LINE(S)   1162
LINE     912 USED FOR LINE(S)   1160
LINE     917 USED FOR LINE(S)   1143
LINE     923 USED FOR LINE(S)   1149
```

```
 generate lines to fill in lid at top of WP
 lines tube height

LINE CONNECTS KEYPOINTS    414   421
 LINE NO.=  1121  KP1=    414  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    421  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    422   429
 LINE NO.=  1124  KP1=    422  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    429  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    430   437
 LINE NO.=  1125  KP1=    430  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    437  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    438   445
 LINE NO.=  1131  KP1=    438  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    445  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    446   453
 LINE NO.=  1138  KP1=    446  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    453  TAN2=    C.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000
 end lines

LINE CONNECTS KEYPOINTS    370   518
 LINE NO.=  1141  KP1=    370  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    518  TAN2=    C.0000   1.0000   0.0000

LINE CONNECTS KEYPOINTS    539   413
 LINE NO.=  1143  KP1=    539  TAN1=    C.0000  -1.0000   0.0000
                  KP2=    413  TAN2=    C.0000   1.0000   0.0000

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
     TO  NDIV =    4,  SPACING RATIO =   1.000

DEFINE AREA BY LIST OF LINES
     LINE LIST =   832 1116 1120 1141
     (TRAVERSED IN SAME DIRECTION AS LINE   832)

    AREA NUMBER =    687

DEFINE AREA BY LIST OF LINES
     LINE LIST =   936  937  941 1121
     (TRAVERSED IN SAME DIRECTION AS LINE   936)

    AREA NUMBER =    688

DEFINE AREA BY LIST OF LINES
     LINE LIST =   946  947  951 1124
     (TRAVERSED IN SAME DIRECTION AS LINE   946)

    AREA NUMBER =    689

DEFINE AREA BY LIST OF LINES
     LINE LIST =   956  959  961 1125
     (TRAVERSED IN SAME DIRECTION AS LINE   956)

    AREA NUMBER =    690

DEFINE AREA BY LIST OF LINES
     LINE LIST =   966  969  971 1131
     (TRAVERSED IN SAME DIRECTION AS LINE   966)

    AREA NUMBER =    691

DEFINE AREA BY LIST OF LINES
     LINE LIST =   976  979  981 1138
```

```
     (TRAVERSED IN SAME DIRECTION AS LINE   976)

    AREA NUMBER =    692

DEFINE AREA BY LIST OF LINES
     LINE LIST =   932 1143 1147 1151
     (TRAVERSED IN SAME DIRECTION AS LINE   932)

    AREA NUMBER =    693

DEFINE AREA BY LIST OF LINES
     LINE LIST =   842 1122 1123
     (TRAVERSED IN SAME DIRECTION AS LINE   842)

    AREA NUMBER =    694

DEFINE AREA BY LIST OF LINES
     LINE LIST =   985  989  990  993
     (TRAVERSED IN SAME DIRECTION AS LINE   985)

    AREA NUMBER =    695

DEFINE AREA BY LIST OF LINES
     LINE LIST =   997 1001 1002 1005
     (TRAVERSED IN SAME DIRECTION AS LINE   997)

    AREA NUMBER =    696

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1010 1013 1015 1018
     (TRAVERSED IN SAME DIRECTION AS LINE  1010)

    AREA NUMBER =    697

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1021 1025 1028 1029
     (TRAVERSED IN SAME DIRECTION AS LINE  1021)

    AREA NUMBER =    698

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1033 1037 1040 1041
     (TRAVERSED IN SAME DIRECTION AS LINE  1033)

    AREA NUMBER =    699

DEFINE AREA BY LIST OF LINES
     LINE LIST =   922 1144 1148
     (TRAVERSED IN SAME DIRECTION AS LINE   922)

    AREA NUMBER =    700

DEFINE AREA BY LIST OF LINES
     LINE LIST =   857 1153 1156
     (TRAVERSED IN SAME DIRECTION AS LINE   857)

    AREA NUMBER =    701

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1046 1049 1051 1054
     (TRAVERSED IN SAME DIRECTION AS LINE  1046)

    AREA NUMBER =    702

DEFINE AREA BY LIST OF LINES
     LINE LIST =  1058 1061 1063 1066
     (TRAVERSED IN SAME DIRECTION AS LINE  1058)

    AREA NUMBER =    703
```

```
DEFINE AREA BY LIST OF LINES
     LINE LIST =  1070 1073 1075 1078
     (TRAVERSED IN SAME DIRECTION AS LINE  1070)

    AREA NUMBER =    704

DEFINE AREA BY LIST OF LINES
     LINE LIST =   907 1159 1163
     (TRAVERSED IN SAME DIRECTION AS LINE   907)

    AREA NUMBER =    705

DEFINE AREA BY LIST OF LINES
     LINE LIST =   872 1126 1130
     (TRAVERSED IN SAME DIRECTION AS LINE   872)

    AREA NUMBER =    706

DEFINE AREA BY LIST OF LINES
     LINE LIST =   882 1132 1133 1137
     (TRAVERSED IN SAME DIRECTION AS LINE   882)

    AREA NUMBER =    707

DEFINE AREA BY LIST OF LINES
     LINE LIST =   892 1139 1140
     (TRAVERSED IN SAME DIRECTION AS LINE   892)

    AREA NUMBER =    708

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  2.3075     AND   2.3075
  KABS=  0.  TOLERANCE= 0.115375E-01

  135  AREAS (OF   708  DEFINED) SELECTED BY  ASEL  COMMAND.

DRAG ALL SELECTED AREAS
     ALONG LINES
         3,

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 514 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 518 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 522 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 526 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 530 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.230   TIME= 20:54:10
Area 534 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.240   TIME= 20:54:11
Area 538 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.240   TIME= 20:54:11
Area 542 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.240   TIME= 20:54:11
Area 546 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.240   TIME= 20:54:11
Area 550 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.240   TIME= 20:54:11
```

```
Area 554 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 558 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 562 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 566 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 570 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 574 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 578 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.240   TIME= 20:54:11
Area 582 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 586 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 590 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 594 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 595 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 596 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 597 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 598 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 599 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 600 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.250   TIME= 20:54:11
Area 601 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 602 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 603 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 604 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 605 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 606 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 607 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 608 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 609 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 610 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 611 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 612 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.260   TIME= 20:54:11
Area 613 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 614 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 615 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 616 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 617 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 618 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 619 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 620 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 621 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 622 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 623 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.270   TIME= 20:54:11
Area 624 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 625 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 626 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 627 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 628 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 629 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=     15.280   TIME= 20:54:11
Area 630 is not meshed.  Volume will be generated without elements.
```

```
*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 631 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 632 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 633 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 634 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 635 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.280   TIME= 20:54:11
Area 636 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 637 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 638 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 639 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 640 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 641 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 642 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 643 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 644 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 645 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 646 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.290   TIME= 20:54:11
Area 647 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 648 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 649 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 650 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 651 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 652 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
Area 653 is not meshed.  Volume will be generated without elements.

*** WARNING ***                          CP=     15.300   TIME= 20:54:11
```

```
Area 654 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.300   TIME= 20:54:11
Area 655 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.300   TIME= 20:54:11
Area 656 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.300   TIME= 20:54:11
Area 657 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.300   TIME= 20:54:11
Area 658 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.300   TIME= 20:54:11
Area 659 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 660 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 661 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 662 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 663 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 664 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 665 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 666 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 667 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 668 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 669 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.310   TIME= 20:54:11
Area 670 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 671 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 672 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 673 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 674 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 675 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 676 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.320   TIME= 20:54:11
Area 677 is not meshed.  Volume will be generated without elements.
```

*** WARNING *** CP= 15.320 TIME= 20:54:11
Area 678 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.320 TIME= 20:54:11
Area 679 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.320 TIME= 20:54:11
Area 680 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.320 TIME= 20:54:11
Area 681 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.320 TIME= 20:54:11
Area 682 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 683 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 684 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 685 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 686 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 687 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 688 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 689 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 690 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 691 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 692 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.330 TIME= 20:54:11
Area 693 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 694 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 695 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 696 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 697 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 698 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 699 is not meshed. Volume will be generated without elements.

*** WARNING *** CP= 15.340 TIME= 20:54:11
Area 700 is not meshed. Volume will be generated without elements.

```
*** WARNING ***                         CP=      15.340   TIME= 20:54:11
Area 701 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.340   TIME= 20:54:11
Area 702 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.340   TIME= 20:54:11
Area 703 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.340   TIME= 20:54:11
Area 704 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.340   TIME= 20:54:11
Area 705 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.350   TIME= 20:54:11
Area 706 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.350   TIME= 20:54:11
Area 707 is not meshed.  Volume will be generated without elements.

*** WARNING ***                         CP=      15.350   TIME= 20:54:11
Area 708 is not meshed.  Volume will be generated without elements.
 lines at bottom lid used to be here

 Mesh Volumes

 Mesh the CS Tubes

 Mesh SS-B Plates

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      48 TO       71 STEP        1

   24  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      2

MATERIAL NUMBER SET TO     2

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=      23.740   TIME= 20:54:32
Meshing of volume 49 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    49 WITH EXCESSIVE ASPECT RATIO ***
          121     122     123     136     137     138     151     152
          153     166     167     168     181     182     183     196
          197     198     211     212     213     226     227     228


*** WARNING ***                         CP=      23.960   TIME= 20:54:32
Meshing of volume 50 produced 60 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    50 WITH EXCESSIVE ASPECT RATIO ***
          241     242     243     244     245     246     247     248
          249     250     251     252     253     254     255     256
          257     258     259     260     261     262     263     264
          265     266     267     268     269     270     271     272
          273     274     275     276     277     278     279     280
          281     282     283     284     285     286     287     288
          289     290     291     292     293     294     295     296
          297     298     299     300


*** WARNING ***                         CP=      25.290   TIME= 20:54:35
Meshing of volume 54 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.
```

*** LIST OF ELEMENTS IN VOLUME 54 WITH EXCESSIVE ASPECT RATIO ***

661	662	663	676	677	678	691	692
693	706	707	708	721	722	723	736
737	738	751	752	753	766	767	768

*** WARNING *** CP= 25.510 TIME= 20:54:36
Meshing of volume 55 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 55 WITH EXCESSIVE ASPECT RATIO ***

781	782	783	784	785	786	787	788
789	790	791	792	793	794	795	796
797	798	799	800	801	802	803	804
805	806	807	808	809	810	811	812
813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828
829	830	831	832	833	834	835	836
837	838	839	840				

*** WARNING *** CP= 26.050 TIME= 20:54:37
Meshing of volume 57 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 57 WITH EXCESSIVE ASPECT RATIO ***

961	962	963	964	965	966	967	968
969	970	971	972	973	974	975	976
977	978	979	980	981	982	983	984
985	986	987	988	989	990	991	992
993	994	995	996	997	998	999	1000
1001	1002	1003	1004	1005	1006	1007	1008
1009	1010	1011	1012	1013	1014	1015	1016
1017	1018	1019	1020				

*** WARNING *** CP= 27.380 TIME= 20:54:40
Meshing of volume 61 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 61 WITH EXCESSIVE ASPECT RATIO ***

1381	1382	1383	1396	1397	1398	1411	1412
1413	1426	1427	1428	1441	1442	1443	1456
1457	1458	1471	1472	1473	1486	1487	1488

*** WARNING *** CP= 27.600 TIME= 20:54:41
Meshing of volume 62 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 62 WITH EXCESSIVE ASPECT RATIO ***

1501	1502	1503	1504	1505	1506	1507	1508
1509	1510	1511	1512	1513	1514	1515	1516
1517	1518	1519	1520	1521	1522	1523	1524
1525	1526	1527	1528	1529	1530	1531	1532
1533	1534	1535	1536	1537	1538	1539	1540
1541	1542	1543	1544	1545	1546	1547	1548
1549	1550	1551	1552	1553	1554	1555	1556
1557	1558	1559	1560				

*** WARNING *** CP= 28.130 TIME= 20:54:43
Meshing of volume 64 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 64 WITH EXCESSIVE ASPECT RATIO ***

1681	1682	1683	1684	1685	1686	1687	1688
1689	1690	1691	1692	1693	1694	1695	1696
1697	1698	1699	1700	1701	1702	1703	1704

```
      1705    1706    1707    1708    1709    1710    1711    1712
      1713    1714    1715    1716    1717    1718    1719    1720
      1721    1722    1723    1724    1725    1726    1727    1728
      1729    1730    1731    1732    1733    1734    1735    1736
      1737    1738    1739    1740


*** WARNING ***                         CP=     29.530   TIME= 20:54:45
Meshing of volume 68 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    68 WITH EXCESSIVE ASPECT RATIO ***
      2101    2102    2103    2116    2117    2118    2131    2132
      2133    2146    2147    2148    2161    2162    2163    2176
      2177    2178    2191    2192    2193    2206    2207    2208


*** WARNING ***                         CP=     29.770   TIME= 20:54:46
Meshing of volume 69 produced 60 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    69 WITH EXCESSIVE ASPECT RATIO ***
      2221    2222    2223    2224    2225    2226    2227    2228
      2229    2230    2231    2232    2233    2234    2235    2236
      2237    2238    2239    2240    2241    2242    2243    2244
      2245    2246    2247    2248    2249    2250    2251    2252
      2253    2254    2255    2256    2257    2258    2259    2260
      2261    2262    2263    2264    2265    2266    2267    2268
      2269    2270    2271    2272    2273    2274    2275    2276
      2277    2278    2279    2280


NUMBER OF VOLUMES MESHED   =     24
MAXIMUM NODE NUMBER        =   4000
MAXIMUM ELEMENT NUMBER     =   2520
 Mesh End Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      72 TO       86 STEP        1

   15  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      3

MATERIAL NUMBER SET TO     3

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     31.120   TIME= 20:54:51
Meshing of volume 72 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    72 WITH EXCESSIVE ASPECT RATIO ***
      2521    2536    2551    2566    2581    2596    2611    2626


*** WARNING ***                         CP=     31.330   TIME= 20:54:51
Meshing of volume 73 produced 52 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    73 WITH EXCESSIVE ASPECT RATIO ***
      2641    2642    2643    2644    2645    2646    2647    2648
      2649    2650    2651    2652    2653    2654    2655    2656
      2657    2658    2659    2660    2661    2662    2663    2664
      2665    2666    2671    2672    2673    2674    2675    2676
      2677    2678    2679    2680    2681    2682    2683    2684
      2685    2686    2687    2688    2689    2690    2691    2692
      2693    2694    2695    2696
```

```
*** WARNING ***                         CP=     31.670   TIME= 20:54:52
Meshing of volume 74 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    74 WITH EXCESSIVE ASPECT RATIO ***
         2701    2702    2703    2716    2717    2718    2731    2732
         2733    2746    2747    2748    2761    2762    2763    2776
         2777    2778    2791    2792    2793    2806    2807    2808


*** WARNING ***                         CP=     31.770   TIME= 20:54:52
Volume 75 area 75 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     31.780   TIME= 20:54:52
Volume 75 area 380 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     32.020   TIME= 20:54:53
Meshing of volume 75 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    75 WITH EXCESSIVE DISTORTION ***
         2881    2882    2883    2884    2885    2886    2887    2888
         2889    2890    2891    2892    2893    2894    2895    2896
         2897    2898    2899    2900    2901    2902    2903    2904
         2905    2906    2907    2908    2909    2910    2911    2912
         2913    2914    2915    2916    2917    2918    2919    2920
         2921    2922    2923    2924    2925    2926    2927    2928
         2929    2930    2931    2932    2933    2934    2935    2936
         2937    2938    2939    2940


*** WARNING ***                         CP=     32.140   TIME= 20:54:53
Volume 76 area 76 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     32.150   TIME= 20:54:53
Volume 76 area 384 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     32.390   TIME= 20:54:53
Meshing of volume 76 produced 60 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME    76 WITH EXCESSIVE DISTORTION ***
         2941    2942    2945    2946    2949    2950    2953    2954
         2957    2958    2961    2962    2965    2966    2969    2970
         2973    2974    2977    2978    2981    2982    2985    2986
         2989    2990    2993    2994    2997    2998    3001    3002
         3005    3006    3009    3010    3013    3014    3017    3018
         3021    3022    3025    3026    3029    3030    3033    3034
         3037    3038    3041    3042    3045    3046    3049    3050
         3053    3054    3057    3058


*** WARNING ***                         CP=     32.630   TIME= 20:54:54
Meshing of volume 77 produced 52 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    77 WITH EXCESSIVE ASPECT RATIO ***
         3061    3062    3063    3064    3065    3066    3067    3068
         3069    3070    3071    3072    3073    3074    3075    3076
         3077    3078    3079    3080    3081    3082    3083    3084
         3085    3086    3091    3092    3093    3094    3095    3096
         3097    3098    3099    3100    3101    3102    3103    3104
         3105    3106    3107    3108    3109    3110    3111    3112
         3113    3114    3115    3116


*** WARNING ***                         CP=     32.990   TIME= 20:54:55
Meshing of volume 78 produced 24 elements with excessive aspect ratio.
```

Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 73 WITH EXCESSIVE ASPECT RATIO ***

3121	3122	3123	3124	3125	3126	3151	3152
3153	3154	3155	3156	3181	3182	3183	3184
3185	3186	3211	3212	3213	3214	3215	3216

*** WARNING *** CP= 33.620 TIME= 20:54:57
Meshing of volume 80 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 80 WITH EXCESSIVE ASPECT RATIO ***

3361	3362	3363	3364	3365	3366	3367	3368
3369	3370	3371	3372	3373	3374	3375	3376
3377	3378	3379	3380	3381	3382	3383	3384
3385	3386	3391	3392	3393	3394	3395	3396
3397	3398	3399	3400	3401	3402	3403	3404
3405	3406	3407	3408	3409	3410	3411	3412
3413	3414	3415	3416				

*** WARNING *** CP= 33.960 TIME= 20:54:57
Meshing of volume 81 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 81 WITH EXCESSIVE ASPECT RATIO ***

3421	3422	3423	3424	3425	3426	3451	3452
3453	3454	3455	3456	3481	3482	3483	3484
3485	3486	3511	3512	3513	3514	3515	3516

*** WARNING *** CP= 34.080 TIME= 20:54:57
Volume 82 area 82 has a corner angle of 32 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.090 TIME= 20:54:57
Volume 82 area 404 has a corner angle of 32 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.320 TIME= 20:54:58
Meshing of volume 82 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 82 WITH EXCESSIVE DISTORTION ***

3543	3544	3547	3548	3551	3552	3555	3556
3559	3560	3563	3564	3567	3568	3571	3572
3575	3576	3579	3580	3583	3584	3587	3588
3591	3592	3595	3596	3599	3600	3603	3604
3607	3608	3611	3612	3615	3616	3619	3620
3623	3624	3627	3628	3631	3632	3635	3636
3639	3640	3643	3644	3647	3648	3651	3652
3655	3656	3659	3660				

*** WARNING *** CP= 34.450 TIME= 20:54:58
Volume 83 area 83 has a corner angle of 32 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.470 TIME= 20:54:58
Volume 83 area 408 has a corner angle of 32 degrees. This is not
recommended for hexahedral elements.

*** WARNING *** CP= 34.710 TIME= 20:54:58
Meshing of volume 83 produced 60 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 83 WITH EXCESSIVE DISTORTION ***

3721	3722	3723	3724	3725	3726	3727	3728
3729	3730	3731	3732	3733	3734	3735	3736
3737	3738	3739	3740	3741	3742	3743	3744
3745	3746	3747	3748	3749	3750	3751	3752

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      3753    3754    3755    3756    3757    3758    3759    3760
      3761    3762    3763    3764    3765    3766    3767    3768
      3769    3770    3771    3772    3773    3774    3775    3776
      3777    3778    3779    3780

*** WARNING ***                         CP=     34.930   TIME= 20:54:59
Meshing of volume 84 produced 52 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    84 WITH EXCESSIVE ASPECT RATIO ***
      3781    3782    3783    3784    3785    3786    3787    3788
      3789    3790    3791    3792    3793    3796    3797    3798
      3799    3800    3801    3802    3803    3804    3805    3806
      3807    3808    3811    3812    3813    3814    3815    3816
      3817    3818    3819    3820    3821    3822    3823    3826
      3827    3828    3829    3830    3831    3832    3833    3834
      3835    3836    3837    3838

*** WARNING ***                         CP=     35.260   TIME= 20:54:59
Meshing of volume 85 produced 24 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    85 WITH EXCESSIVE ASPECT RATIO ***
      3841    3842    3843    3856    3857    3858    3871    3872
      3873    3886    3887    3888    3901    3902    3903    3916
      3917    3918    3931    3932    3933    3946    3947    3948

*** WARNING ***                         CP=     35.600   TIME= 20:55:00
Meshing of volume 86 produced 8 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    86 WITH EXCESSIVE ASPECT RATIO ***
      3961    3976    3991    4006    4021    4036    4051    4066


NUMBER OF VOLUMES MESHED   =     15
MAXIMUM NODE NUMBER        =   6448
MAXIMUM ELEMENT NUMBER     =   4080
 Mesh Corner Guides

SELECT       FOR ITEM=VOLU COMPONENT=
 IN RANGE      87 TO       92 STEP        1

   6  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ELEMENT TYPE SET TO      4

MATERIAL NUMBER SET TO     4

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                         CP=     36.360   TIME= 20:55:01
Meshing of volume 88 produced 55 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.

    *** LIST OF ELEMENTS IN VOLUME    88 WITH EXCESSIVE ASPECT RATIO ***
      4201    4202    4203    4204    4205    4206    4207    4208
      4209    4210    4211    4212    4213    4214    4215    4216
      4217    4218    4219    4220    4221    4222    4223    4224
      4225    4226    4227    4228    4231    4232    4233    4234
      4235    4236    4237    4238    4239    4240    4241    4242
      4243    4244    4245    4246    4247    4248    4249    4250
      4251    4252    4253    4254    4255    4256    4258

*** WARNING ***                         CP=     37.330   TIME= 20:55:02
Meshing of volume 91 produced 55 elements with excessive aspect ratio.
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```
 Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME    91 WITH EXCESSIVE ASPECT RATIO ***
         4501    4502    4503    4504    4505    4506    4507    4508
         4509    4510    4511    4512    4513    4514    4515    4516
         4517    4518    4519    4520    4521    4522    4523    4524
         4525    4526    4527    4528    4531    4532    4533    4534
         4535    4536    4537    4538    4539    4540    4541    4542
         4543    4544    4545    4546    4547    4548    4549    4550
         4551    4552    4553    4554    4555    4556    4557

NUMBER OF VOLUMES MESHED   =      6
MAXIMUM NODE NUMBER        =   7280
MAXIMUM ELEMENT NUMBER     =   4680
 Mesh Inner Barrier

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.71295
  KABS=  0.  TOLERANCE= 0.000000E+00

  269  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   177  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.69095     AND  0.71295
  KABS=  0.  TOLERANCE= 0.000000E+00

   114  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT  FOR ITEM=LOC  COMPONENT=Y     BETWEEN -90.000     AND   5.0000
  KABS=  0.  TOLERANCE= 0.000000E+00

  197  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
  KABS=  0.  TOLERANCE= 0.000000E+00

   147  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN-0.10000E-01 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  147  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      5

MATERIAL NUMBER SET TO     5

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     41.570   TIME= 20:55:12
Meshing of volume 93 produced 48 elements with excessive aspect ratio.
 Changing the element divisions on this volume may help.
```

*** LIST OF ELEMENTS IN VOLUME 93 WITH EXCESSIVE ASPECT RATIO ***

4681	4682	4683	4684	4685	4686	4696	4697
4698	4699	4700	4701	4711	4712	4713	4714
4715	4716	4726	4727	4728	4729	4730	4731
4741	4742	4743	4744	4745	4746	4756	4757
4758	4759	4760	4761	4771	4772	4773	4774
4775	4776	4786	4787	4788	4789	4790	4791

*** WARNING *** CP= 41.800 TIME= 20:55:12
Meshing of volume 94 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 94 WITH EXCESSIVE ASPECT RATIO ***

4801	4802	4803	4804	4805	4806	4807	4808
4809	4810	4811	4812	4813	4814	4815	4816
4817	4818	4819	4820	4821	4822	4823	4824
4825	4826	4827	4828	4829	4830	4831	4832
4833	4834	4835	4836	4837	4838	4839	4840
4841	4842	4843	4844	4845	4846	4847	4848
4849	4850	4851	4852	4853	4854	4855	4856
4857	4858	4859	4860				

*** WARNING *** CP= 42.230 TIME= 20:55:13
Meshing of volume 95 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 95 WITH EXCESSIVE ASPECT RATIO ***

4861	4862	4863	4864	4865	4866	4891	4892
4893	4894	4895	4896	4921	4922	4923	4924
4925	4926	4951	4952	4953	4954	4955	4956

*** WARNING *** CP= 42.440 TIME= 20:55:14
Meshing of volume 96 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 96 WITH EXCESSIVE ASPECT RATIO ***

4981	4982	4983	4984	4985	4986	4987	4988
4989	4990	4991	4992	4993	4994	4995	4996
4997	4998	4999	5000	5001	5002	5003	5004
5005	5006	5011	5012	5013	5014	5015	5016
5017	5018	5019	5020	5021	5022	5023	5024
5025	5026	5027	5028	5029	5030	5031	5032
5033	5034	5035	5036				

*** WARNING *** CP= 42.660 TIME= 20:55:14
Meshing of volume 97 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 97 WITH EXCESSIVE ASPECT RATIO ***

5041	5042	5043	5044	5045	5046	5047	5048
5049	5050	5051	5052	5053	5054	5055	5056
5057	5058	5059	5060	5061	5062	5063	5064
5065	5066	5067	5068	5069	5070	5071	5072
5073	5074	5075	5076	5077	5078	5079	5080
5081	5082	5083	5084	5085	5086	5087	5088
5089	5090	5091	5092	5093	5094	5095	5096
5097	5098	5099	5100				

*** WARNING *** CP= 43.100 TIME= 20:55:15
Meshing of volume 98 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 98 WITH EXCESSIVE ASPECT RATIO ***

5101	5102	5131	5132	5161	5162	5191	5192

*** WARNING *** CP= 43.310 TIME= 20:55:16
Meshing of volume 99 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 99 WITH EXCESSIVE ASPECT RATIO ***

5221	5222	5223	5224	5225	5226	5227	5228
5229	5230	5231	5232	5233	5234	5235	5236
5237	5238	5239	5240	5241	5242	5243	5244
5245	5246	5247	5248	5249	5250	5251	5252
5253	5254	5255	5256	5257	5258	5259	5260
5261	5262	5263	5264	5265	5266	5267	5268
5269	5270	5271	5272	5273	5274	5275	5276
5277	5278	5279	5280				

*** WARNING *** CP= 43.520 TIME= 20:55:16
Meshing of volume 100 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 100 WITH EXCESSIVE ASPECT RATIO ***

5281	5282	5283	5284	5285	5286	5287	5288
5289	5290	5291	5292	5293	5294	5295	5296
5297	5298	5299	5300	5301	5302	5303	5304
5305	5306	5311	5312	5313	5314	5315	5316
5317	5318	5319	5320	5321	5322	5323	5324
5325	5326	5327	5328	5329	5330	5331	5332
5333	5334	5335	5336				

*** WARNING *** CP= 43.960 TIME= 20:55:17
Meshing of volume 101 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 101 WITH EXCESSIVE ASPECT RATIO ***

5341	5342	5343	5344	5345	5346	5371	5372
5373	5374	5375	5376	5401	5402	5403	5404
5405	5406	5431	5432	5433	5434	5435	5436

*** WARNING *** CP= 44.170 TIME= 20:55:18
Meshing of volume 102 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 102 WITH EXCESSIVE ASPECT RATIO ***

5461	5462	5463	5464	5465	5466	5467	5468
5469	5470	5471	5472	5473	5474	5475	5476
5477	5478	5479	5480	5481	5482	5483	5484
5485	5486	5487	5488	5489	5490	5491	5492
5493	5494	5495	5496	5497	5498	5499	5500
5501	5502	5503	5504	5505	5506	5507	5508
5509	5510	5511	5512	5513	5514	5515	5516
5517	5518	5519	5520				

*** WARNING *** CP= 44.620 TIME= 20:55:19
Meshing of volume 103 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 103 WITH EXCESSIVE ASPECT RATIO ***

5521	5522	5523	5524	5525	5526	5551	5552
5553	5554	5555	5556	5581	5582	5583	5584
5585	5586	5611	5612	5613	5614	5615	5616

*** WARNING *** CP= 45.260 TIME= 20:55:22
Meshing of volume 119 produced 16 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

```
     *** LIST OF ELEMENTS IN VOLUME   119 WITH EXCESSIVE ASPECT RATIO ***
         5697    5698    5699    5700    5701    5702    5703    5704
         5705    5706    5707    5708    5709    5710    5711    5712


*** WARNING ***                         CP=     46.390   TIME= 20:55:24
Meshing of volume 140 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   140 WITH EXCESSIVE ASPECT RATIO ***
         5825    5826    5827    5828    5829    5830    5831    5832
         5833    5834    5835    5836    5837    5838    5839    5840


*** WARNING ***                         CP=     48.280   TIME= 20:55:29
Volume 173 area 612 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     48.280   TIME= 20:55:29
Volume 173 area 871 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     48.310   TIME= 20:55:29
Meshing of volume 173 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   173 WITH EXCESSIVE DISTORTION ***
         6039    6040


*** WARNING ***                         CP=     49.520   TIME= 20:55:32
Volume 189 area 628 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.530   TIME= 20:55:32
Volume 189 area 935 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.560   TIME= 20:55:32
Meshing of volume 189 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   189 WITH EXCESSIVE DISTORTION ***
         6167    6168


*** WARNING ***                         CP=     49.690   TIME= 20:55:33
Volume 191 area 630 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.690   TIME= 20:55:33
Volume 191 area 943 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     49.720   TIME= 20:55:33
Meshing of volume 191 produced 2 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   191 WITH EXCESSIVE DISTORTION ***
         6183    6184


*** WARNING ***                         CP=     50.470   TIME= 20:55:35
Volume 201 area 640 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     50.480   TIME= 20:55:35
Volume 201 area 983 has a corner angle of 37 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                         CP=     50.500   TIME= 20:55:35
Meshing of volume 201 produced 2 elements with excessive distortion.
```

```
     *** LIST OF ELEMENTS IN VOLUME   201 WITH EXCESSIVE DISTORTION ***
         6263    6264


*** WARNING ***                          CP=     52.900   TIME= 20:55:40
Volume 230 area 669 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     52.910   TIME= 20:55:40
Volume 230 area 1058 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     52.960   TIME= 20:55:40
Meshing of volume 230 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   230 WITH EXCESSIVE DISTORTION ***
         6657    6658    6659    6660    6661    6662    6663    6664


*** WARNING ***                          CP=     53.000   TIME= 20:55:40
Volume 231 area 670 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.010   TIME= 20:55:40
Volume 231 area 1061 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.050   TIME= 20:55:40
Meshing of volume 231 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   231 WITH EXCESSIVE DISTORTION ***
         6665    6666    6669    6670    6673    6674    6677    6678


*** WARNING ***                          CP=     53.550   TIME= 20:55:41
Volume 237 area 676 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.560   TIME= 20:55:41
Volume 237 area 1078 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.620   TIME= 20:55:41
Meshing of volume 237 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   237 WITH EXCESSIVE DISTORTION ***
         6747    6748    6751    6752    6755    6756    6759    6760


*** WARNING ***                          CP=     53.670   TIME= 20:55:41
Volume 238 area 677 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.690   TIME= 20:55:41
Volume 238 area 1081 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     53.740   TIME= 20:55:41
Meshing of volume 238 produced 8 elements with excessive distortion.

     *** LIST OF ELEMENTS IN VOLUME   238 WITH EXCESSIVE DISTORTION ***
         6769    6770    6771    6772    6773    6774    6775    6776


*** WARNING ***                          CP=     55.650   TIME= 20:55:47
Volume 255 area 694 has a corner angle of 32 degrees.  This is not
 recommended for hexahedral elements.

*** WARNING ***                          CP=     55.670   TIME= 20:55:47
Volume 255 area 1119 has a corner angle of 32 degrees.  This is not
```

recommended for hexahedral elements.

*** WARNING *** CP= 55.730 TIME= 20:55:47
Meshing of volume 255 produced 14 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 255 WITH EXCESSIVE DISTORTION ***
7121 7122 7123 7124 7125 7126 7127 7128
7130 7132 7134 7136 7138 7142

*** WARNING *** CP= 56.440 TIME= 20:55:49
Volume 261 area 700 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 56.450 TIME= 20:55:49
Volume 261 area 1125 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 56.520 TIME= 20:55:49
Meshing of volume 261 produced 14 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 261 WITH EXCESSIVE DISTORTION ***
7306 7310 7313 7314 7317 7318 7321 7322
7323 7324 7325 7326 7327 7328

*** WARNING *** CP= 56.610 TIME= 20:55:49
Meshing of volume 262 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 262 WITH EXCESSIVE DISTORTION ***
7338 7342

*** WARNING *** CP= 57.210 TIME= 20:55:50
Meshing of volume 266 produced 2 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 266 WITH EXCESSIVE DISTORTION ***
7458 7462

*** WARNING *** CP= 57.240 TIME= 20:55:50
Volume 267 area 706 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.270 TIME= 20:55:50
Volume 267 area 1131 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.330 TIME= 20:55:50
Meshing of volume 267 produced 14 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 267 WITH EXCESSIVE DISTORTION ***
7474 7478 7481 7482 7485 7486 7489 7490
7491 7492 7493 7494 7495 7496

*** WARNING *** CP= 57.520 TIME= 20:55:53
Volume 269 area 708 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.540 TIME= 20:55:53
Volume 269 area 1133 has a corner angle of 32 degrees. This is not recommended for hexahedral elements.

*** WARNING *** CP= 57.600 TIME= 20:55:53
Meshing of volume 269 produced 14 elements with excessive distortion.

*** LIST OF ELEMENTS IN VOLUME 269 WITH EXCESSIVE DISTORTION ***
7529 7530 7531 7532 7533 7534 7535 7536
7538 7540 7542 7544 7546 7550

```
NUMBER OF VOLUMES MESHED   =    147
MAXIMUM NODE NUMBER        =  11541
MAXIMUM ELEMENT NUMBER     =   7552
 Mesh Upper Inner Barrier Adding Backfill Mass

INVERT       FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP        1

  122  VOLUMES (OF   269  DEFINED) SELECTED BY VSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

UNSELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71295     AND  0.78095
  KABS=  0.  TOLERANCE= 0.000000E+00

   122  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND   2.3075
  KABS=  0.  TOLERANCE= 0.000000E+00

  122  VOLUMES (OF   269  DEFINED) SELECTED BY  VSEL  COMMAND.

UNSELECT     FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO       92 STEP        1

    30  VOLUMES (OF    269  DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

ELEMENT TYPE SET TO      6

MATERIAL NUMBER SET TO     6

GENERATE NODES AND ELEMENTS   IN  ALL  SELECTED VOLUMES

*** WARNING ***                          CP=     58.440   TIME= 20:55:55
Meshing of volume 104 produced 60 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   104 WITH EXCESSIVE ASPECT RATIO ***
         7553    7554    7555    7556    7557    7558    7559    7560
         7561    7562    7563    7564    7565    7566    7567    7568
         7569    7570    7571    7572    7573    7574    7575    7576
         7577    7578    7579    7580    7581    7582    7583    7584
         7585    7586    7587    7588    7589    7590    7591    7592
         7593    7594    7595    7596    7597    7598    7599    7600
         7601    7602    7603    7604    7605    7606    7607    7608
         7609    7610    7611    7612


*** WARNING ***                          CP=     58.880   TIME= 20:55:56
Meshing of volume 105 produced 24 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   105 WITH EXCESSIVE ASPECT RATIO ***
         7613    7614    7615    7616    7617    7618    7643    7644
         7645    7646    7647    7648    7673    7674    7675    7676
         7677    7678    7703    7704    7705    7706    7707    7708


*** WARNING ***                          CP=     59.110   TIME= 20:55:56
Meshing of volume 106 produced 52 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   106 WITH EXCESSIVE ASPECT RATIO ***
         7733    7734    7735    7736    7737    7738    7739    7740
         7741    7742    7743    7744    7745    7746    7747    7748
         7749    7750    7751    7752    7753    7754    7755    7756
```

7757	7758	7763	7764	7765	7766	7767	7768
7769	7770	7771	7772	7773	7774	7775	7776
7777	7778	7779	7780	7781	7782	7783	7784
7785	7786	7787	7788				

*** WARNING *** CP= 59.320 TIME= 20:55:57
Meshing of volume 107 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 107 WITH EXCESSIVE ASPECT RATIO ***

7793	7794	7795	7796	7797	7798	7799	7800
7801	7802	7803	7804	7805	7806	7807	7808
7809	7810	7811	7812	7813	7814	7815	7816
7817	7818	7819	7820	7821	7822	7823	7824
7825	7826	7827	7828	7829	7830	7831	7832
7833	7834	7835	7836	7837	7838	7839	7840
7841	7842	7843	7844	7845	7846	7847	7848
7849	7850	7851	7852				

*** WARNING *** CP= 59.760 TIME= 20:55:58
Meshing of volume 108 produced 8 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 108 WITH EXCESSIVE ASPECT RATIO ***

7853	7854	7883	7884	7913	7914	7943	7944

*** WARNING *** CP= 59.990 TIME= 20:55:58
Meshing of volume 109 produced 60 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 109 WITH EXCESSIVE ASPECT RATIO ***

7973	7974	7975	7976	7977	7978	7979	7980
7981	7982	7983	7984	7985	7986	7987	7988
7989	7990	7991	7992	7993	7994	7995	7996
7997	7998	7999	8000	8001	8002	8003	8004
8005	8006	8007	8008	8009	8010	8011	8012
8013	8014	8015	8016	8017	8018	8019	8020
8021	8022	8023	8024	8025	8026	8027	8028
8029	8030	8031	8032				

*** WARNING *** CP= 60.200 TIME= 20:55:59
Meshing of volume 110 produced 52 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 110 WITH EXCESSIVE ASPECT RATIO ***

8033	8034	8035	8036	8037	8038	8039	8040
8041	8042	8043	8044	8045	8046	8047	8048
8049	8050	8051	8052	8053	8054	8055	8056
8057	8058	8063	8064	8065	8066	8067	8068
8069	8070	8071	8072	8073	8074	8075	8076
8077	8078	8079	8080	8081	8082	8083	8084
8085	8086	8087	8088				

*** WARNING *** CP= 60.630 TIME= 20:56:00
Meshing of volume 111 produced 24 elements with excessive aspect ratio.
Changing the element divisions on this volume may help.

*** LIST OF ELEMENTS IN VOLUME 111 WITH EXCESSIVE ASPECT RATIO ***

8093	8094	8095	8096	8097	8098	8123	8124
8125	8126	8127	8128	8153	8154	8155	8156
8157	8158	8183	8184	8185	8186	8187	8188

*** WARNING *** CP= 60.850 TIME= 20:56:01
Meshing of volume 112 produced 60 elements with excessive aspect ratio.

```
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   112 WITH EXCESSIVE ASPECT RATIO ***
         8213    8214    8215    8216    8217    8218    8219    8220
         8221    8222    8223    8224    8225    8226    8227    8228
         8229    8230    8231    8232    8233    8234    8235    8236
         8237    8238    8239    8240    8241    8242    8243    8244
         8245    8246    8247    8248    8249    8250    8251    8252
         8253    8254    8255    8256    8257    8258    8259    8260
         8261    8262    8263    8264    8265    8266    8267    8268
         8269    8270    8271    8272


*** WARNING ***                          CP=     61.230   TIME= 20:56:02
Meshing of volume 113 produced 48 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   113 WITH EXCESSIVE ASPECT RATIO ***
         8273    8274    8275    8276    8277    8278    8279    8280
         8281    8282    8283    8284    8303    8304    8305    8306
         8307    8308    8309    8310    8311    8312    8313    8314
         8333    8334    8335    8336    8337    8338    8339    8340
         8341    8342    8343    8344    8363    8364    8365    8366
         8367    8368    8369    8370    8371    8372    8373    8374


*** WARNING ***                          CP=     61.730   TIME= 20:56:03
Meshing of volume 129 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   129 WITH EXCESSIVE ASPECT RATIO ***
         8433    8434    8435    8436    8437    8438    8439    8440
         8441    8442    8443    8444    8445    8446    8447    8448


*** WARNING ***                          CP=     62.630   TIME= 20:56:06
Meshing of volume 150 produced 16 elements with excessive aspect ratio.
  Changing the element divisions on this volume may help.

     *** LIST OF ELEMENTS IN VOLUME   150 WITH EXCESSIVE ASPECT RATIO ***
         8545    8546    8547    8548    8549    8550    8551    8552
         8553    8554    8555    8556    8557    8558    8559    8560


NUMBER OF VOLUMES MESHED   =     30
MAXIMUM NODE NUMBER        =  12897
MAXIMUM ELEMENT NUMBER     =   8616
 Mesh Lower Outer Barrier and Lids
 mesh upper outer barrier adding backfill mass

 Apply Symmetry Constraints

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SELECT       FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05

   555  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   X
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                             CP=     63.420   TIME= 20:56:08
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=   555

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN 0.00000E+00 AND  0.00000E+00
  KABS=  0.  TOLERANCE= 0.100000E-05
```

```
   606  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SYMMETRY CONSTRAINTS FOR COORDINATE SYSTEM  0 IN DIRECTION   Z
ON SURFACE DEFINED BY ALL SELECTED NODES

*** NOTE ***                            CP=     63.830   TIME= 20:56:09
Nodes on symmetry surfaces are rotated into coordinate system 0.

TOTAL SPECIFIED CONSTRAINTS=  1161
 Apply Constraints at Support Locations
 Span approximately half of basket height, width = 0.305 m

ACTIVE COORDINATE SYSTEM SET TO      1  (CYLINDRICAL)

SELECT       FOR ITEM=LOC  COMPONENT=Z     BETWEEN  1.0675     AND   1.5450
  KABS=  0.  TOLERANCE= 0.000000E+00

  1818  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=X     BETWEEN 0.71195     AND  0.71395
  KABS=  0.  TOLERANCE= 0.000000E+00

   246  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

RESELECT     FOR ITEM=LOC  COMPONENT=Y     BETWEEN -70.000     AND  -50.000
  KABS=  0.  TOLERANCE= 0.000000E+00

    30  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ACTIVE COORDINATE SYSTEM SET TO      0  (CARTESIAN)

SPECIFIED CONSTRAINT UY   FOR SELECTED NODES        1 TO   12897 BY       1
REAL= 0.000000000E+00   IMAG= 0.000000000E+00

SELECT ALL ENTITIES OF TYPE= ALL  AND BELOW

ALL SELECT   FOR ITEM=VOLU COMPONENT=
 IN RANGE       1 TO      269 STEP        1

   269  VOLUMES (OF    269  DEFINED) SELECTED BY  VSEL  COMMAND.

ALL SELECT   FOR ITEM=AREA COMPONENT=
 IN RANGE       1 TO     1133 STEP        1

 1133  AREAS (OF  1133  DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT   FOR ITEM=LINE COMPONENT=
 IN RANGE       1 TO     1604 STEP        1

 1604  LINES (OF  1604  DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT   FOR ITEM=KP   COMPONENT=
 IN RANGE       1 TO     9001 STEP        1

   690  KEYPOINTS (OF    690  DEFINED) SELECTED BY  KSEL  COMMAND.

ALL SELECT   FOR ITEM=ELEM COMPONENT=
 IN RANGE       1 TO     8616 STEP        1

  8616  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALL SELECT   FOR ITEM=NODE COMPONENT=
 IN RANGE       1 TO    12897 STEP        1

 12897  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
 FOR POSSIBLE RESUME FROM THIS POINT
```

***** ROUTINE COMPLETED ***** CP = 72.550

***** ANSYS SOLUTION ROUTINE *****

PERFORM A MODAL ANALYSIS
THIS WILL BE A NEW ANALYSIS

USE SUBSPACE ITERATION METHOD
EXTRACT 8 MODES
NORMALIZE THE MODE SHAPES TO THE MASS MATRIX

WRITE ALL ITEMS TO THE DATABASE WITH A FREQUENCY OF 1
FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
FOR POSSIBLE RESUME FROM THIS POINT

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 83.760 TIME= 20:56:57
Element 2881 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2881 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2882 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2882 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2883 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2883 has an angle between adjacent edges of 139.536079 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.770 TIME= 20:56:57
Element 2884 has an angle between adjacent edges of 40.3670746 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.780 TIME= 20:56:57
Element 2884 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.780 TIME= 20:56:57
Element 2885 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.780 TIME= 20:56:57
Element 2885 has an angle between adjacent edges of 139.536079 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.780 TIME= 20:56:57
Element 2886 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.780 TIME= 20:56:57
Element 2886 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.790 TIME= 20:56:57
Element 2887 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.790 TIME= 20:56:57
Element 2887 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.790 TIME= 20:56:57
Element 2888 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.790 TIME= 20:56:57
Element 2888 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.790 TIME= 20:56:57
Element 2889 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.800 TIME= 20:56:57
Element 2889 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.800 TIME= 20:56:57
Element 2890 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.800 TIME= 20:56:57
Element 2890 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.800 TIME= 20:56:57
Element 2891 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.800 TIME= 20:56:57
Element 2891 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.810 TIME= 20:56:57
Element 2892 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.810 TIME= 20:56:57
Element 2892 has an angle between adjacent edges of 139.585464 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.810 TIME= 20:56:57
Element 2893 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.810 TIME= 20:56:57
Element 2893 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.810 TIME= 20:56:57
Element 2894 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.820 TIME= 20:56:57
Element 2894 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.820 TIME= 20:56:57
Element 2895 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.820 TIME= 20:56:57
Element 2895 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.820 TIME= 20:56:57
Element 2896 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.820 TIME= 20:56:57
Element 2896 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2897 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2897 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2898 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2898 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2899 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.830 TIME= 20:56:57
Element 2899 has an angle between adjacent edges of 139.536079 on face

```
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.830   TIME= 20:56:57
Element 2900 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.830   TIME= 20:56:57
Element 2900 has an angle between adjacent edges of 139.585464 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.830   TIME= 20:56:57
Element 2901 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.830   TIME= 20:56:57
Element 2901 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2902 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2902 has an angle between adjacent edges of 139.585464 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2903 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2903 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2904 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2904 has an angle between adjacent edges of 139.585464 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2905 has an angle between adjacent edges of 40.4145358 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2905 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.840   TIME= 20:56:57
Element 2906 has an angle between adjacent edges of 40.3670746 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.850   TIME= 20:56:57
Element 2906 has an angle between adjacent edges of 139.585464 on face
```

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.850 TIME= 20:56:57
Element 2907 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.850 TIME= 20:56:57
Element 2907 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.850 TIME= 20:56:57
Element 2908 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2908 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2909 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2909 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2910 has an angle between adjacent edges of 40.3670746 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2910 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.860 TIME= 20:56:57
Element 2911 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.870 TIME= 20:56:57
Element 2911 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.870 TIME= 20:56:57
Element 2912 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.870 TIME= 20:56:57
Element 2912 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.870 TIME= 20:56:57
Element 2913 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.870 TIME= 20:56:57
Element 2913 has an angle between adjacent edges of 147.813995 on face

```
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.880   TIME= 20:56:57
Element 2914 has an angle between adjacent edges of 32.0891582 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.880   TIME= 20:56:57
Element 2914 has an angle between adjacent edges of 147.863381 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.880   TIME= 20:56:57
Element 2915 has an angle between adjacent edges of 32.1366194 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.880   TIME= 20:56:57
Element 2915 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.880   TIME= 20:56:57
Element 2916 has an angle between adjacent edges of 32.0891582 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.890   TIME= 20:56:57
Element 2916 has an angle between adjacent edges of 147.863381 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.890   TIME= 20:56:57
Element 2917 has an angle between adjacent edges of 32.1366194 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.890   TIME= 20:56:57
Element 2917 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.890   TIME= 20:56:57
Element 2918 has an angle between adjacent edges of 32.0891582 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.890   TIME= 20:56:57
Element 2918 has an angle between adjacent edges of 147.863381 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.900   TIME= 20:56:57
Element 2919 has an angle between adjacent edges of 32.1366194 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.900   TIME= 20:56:57
Element 2919 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.900   TIME= 20:56:57
Element 2920 has an angle between adjacent edges of 32.0891582 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                          CP=     83.900   TIME= 20:56:57
Element 2920 has an angle between adjacent edges of 147.863381 on face
```

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.900 TIME= 20:56:57
Element 2921 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.900 TIME= 20:56:57
Element 2921 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.910 TIME= 20:56:57
Element 2922 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.910 TIME= 20:56:57
Element 2922 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.910 TIME= 20:56:57
Element 2923 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.910 TIME= 20:56:57
Element 2923 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.910 TIME= 20:56:57
Element 2924 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.920 TIME= 20:56:57
Element 2924 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.920 TIME= 20:56:57
Element 2925 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.920 TIME= 20:56:57
Element 2925 has an angle between adjacent edges of 147.813995 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.920 TIME= 20:56:57
Element 2926 has an angle between adjacent edges of 32.0891582 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.920 TIME= 20:56:57
Element 2926 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2927 has an angle between adjacent edges of 32.1366194 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2927 has an angle between adjacent edges of 147.813995 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2928 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2928 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2929 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.930 TIME= 20:56:57
Element 2929 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2930 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2930 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2931 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2931 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2932 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.940 TIME= 20:56:57
Element 2932 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.950 TIME= 20:56:57
Element 2933 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.950 TIME= 20:56:57
Element 2933 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.950 TIME= 20:56:57
Element 2934 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.950 TIME= 20:56:57
Element 2934 has an angle between adjacent edges of 147.863381 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.950 TIME= 20:56:57
Element 2935 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.960 TIME= 20:56:57
Element 2935 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.960 TIME= 20:56:57
Element 2936 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.960 TIME= 20:56:57
Element 2936 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.960 TIME= 20:56:57
Element 2937 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.960 TIME= 20:56:57
Element 2937 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2938 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2938 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2939 has an angle between adjacent edges of 32.1366194 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2939 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2940 has an angle between adjacent edges of 32.0891582 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.970 TIME= 20:56:57
Element 2940 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.980 TIME= 20:56:57
Element 2941 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.980 TIME= 20:56:57
Element 2941 has an angle between adjacent edges of 147.863381 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.980 TIME= 20:56:57
Element 2942 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.980 TIME= 20:56:57
Element 2942 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.980 TIME= 20:56:57
Element 2945 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.990 TIME= 20:56:57
Element 2945 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.990 TIME= 20:56:57
Element 2946 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.990 TIME= 20:56:57
Element 2946 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.990 TIME= 20:56:57
Element 2949 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 83.990 TIME= 20:56:57
Element 2949 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2950 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2950 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2953 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2953 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2954 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.000 TIME= 20:56:57
Element 2954 has an angle between adjacent edges of 139.585464 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.010 TIME= 20:56:57
Element 2957 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.010 TIME= 20:56:57
Element 2957 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.010 TIME= 20:56:57
Element 2958 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.010 TIME= 20:56:57
Element 2958 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.020 TIME= 20:56:57
Element 2961 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.020 TIME= 20:56:57
Element 2961 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.020 TIME= 20:56:57
Element 2962 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.020 TIME= 20:56:57
Element 2962 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.020 TIME= 20:56:57
Element 2965 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2965 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2966 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2966 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2969 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2969 has an angle between adjacent edges of 147.863381 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.030 TIME= 20:56:57
Element 2970 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.040 TIME= 20:56:57
Element 2970 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.040 TIME= 20:56:57
Element 2973 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.040 TIME= 20:56:57
Element 2973 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.040 TIME= 20:56:57
Element 2974 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.040 TIME= 20:56:57
Element 2974 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.050 TIME= 20:56:57
Element 2977 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.050 TIME= 20:56:57
Element 2977 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.050 TIME= 20:56:57
Element 2978 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.060 TIME= 20:56:57
Element 2978 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.060 TIME= 20:56:57
Element 2981 has an angle between adjacent edges of 40.4145358 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.060 TIME= 20:56:57
Element 2981 has an angle between adjacent edges of 147.863381 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.060 TIME= 20:56:57
Element 2982 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.060 TIME= 20:56:57
Element 2982 has an angle between adjacent edges of 139.585464 on face

4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.070 TIME= 20:56:57
Element 2985 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.070 TIME= 20:56:57
Element 2985 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.070 TIME= 20:56:57
Element 2986 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.070 TIME= 20:56:57
Element 2986 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2989 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2989 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2990 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2990 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2993 has an angle between adjacent edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2993 has an angle between adjacent edges of 147.863381 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2994 has an angle between adjacent edges of 139.585464 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2994 has an angle between adjacent edges of 139.585464 on face
4 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2997 has an angle between adjacert edges of 40.4145358 on face
2 which is outside the recommended range of 90 plus or minus 45
degrees.

*** WARNING *** CP= 84.080 TIME= 20:56:57
Element 2997 has an angle between adjacert edges of 147.863381 on face

4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.090 TIME= 20:56:57
Element 2998 has an angle between adjacent edges of 139.585464 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.090 TIME= 20:56:57
Element 2998 has an angle between adjacent edges of 139.585464 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.090 TIME= 20:56:57
Element 3001 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.090 TIME= 20:56:57
Element 3001 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.090 TIME= 20:56:57
Element 3002 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.100 TIME= 20:56:57
Element 3002 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.100 TIME= 20:56:57
Element 3005 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.100 TIME= 20:56:57
Element 3005 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.100 TIME= 20:56:57
Element 3006 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.100 TIME= 20:56:57
Element 3006 has an angle between adjacent edges of 139.536079 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.110 TIME= 20:56:57
Element 3009 has an angle between adjacent edges of 40.4639215 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.110 TIME= 20:56:57
Element 3009 has an angle between adjacent edges of 147.813995 on face 4 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.110 TIME= 20:56:57
Element 3010 has an angle between adjacent edges of 139.536079 on face 2 which is outside the recommended range of 90 plus or minus 45 degrees.

*** WARNING *** CP= 84.110 TIME= 20:56:57
Element 3010 has an angle between adjacent edges of 139.536079 on face

```
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.120   TIME= 20:56:57
Element 3013 has an angle between adjacent edges of 40.4639215 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.120   TIME= 20:56:57
Element 3013 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.120   TIME= 20:56:57
Element 3014 has an angle between adjacent edges of 139.536079 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.120   TIME= 20:56:57
Element 3014 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.120   TIME= 20:56:57
Element 3017 has an angle between adjacent edges of 40.4639215 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.130   TIME= 20:56:57
Element 3017 has an angle between adjacent edges of 147.813995 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.130   TIME= 20:56:57
Element 3018 has an angle between adjacent edges of 139.536079 on face
 2 which is outside the recommended range of 90 plus or minus 45
 degrees.

*** WARNING ***                         CP=      84.130   TIME= 20:56:57
Element 3018 has an angle between adjacent edges of 139.536079 on face
 4 which is outside the recommended range of 90 plus or minus 45
 degrees.

*****************************************************************************
Error messages discontinued after 200 messages were displayed.
 More may exist.  See ( seism4.err ) for suppressed messages.
*****************************************************************************

*** NOTE ***                           CP=      88.280   TIME= 20:57:01
The model data was checked and warning messages were found.
 Please review output or errors file ( seism4.err ) for these warning
 messages.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   20:57:01  JUN 08, 1996 CP=     88.280
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

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                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
  NUMBER OF MODES TO EXTRACT. . . . . .     8

                  L O A D   S T E P   O P T I O N S
```

LOAD STEP NUMBER. 1

***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

TOTAL MASS = 10424.

CENTROID		MOM. OF INERTIA ABOUT ORIGIN		MOM. OF INERTIA ABOUT CENTROID	
XC =	0.36477	IXX =	0.2083E+05	IXX =	5846.
YC =	0.31176	IYY =	0.2044E+05	IYY =	5082.
ZC =	1.1575	IZZ =	4089.	IZZ =	1689.
		IXY =	-1140.	IXY =	45.56
		IYZ =	-3749.	IYZ =	12.20
		IZX =	-4400.	IZX =	1.117

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
2	3085.89
3	448.703
4	240.549
5	115.124
6	6533.39

Range of element maximum matrix coefficients in global coordinates
Maximum= 5.450155848E+11 at element 5101.
Minimum= 180090805 at element 6499.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	2520	SOLID45	15.020	0.006
3	1560	SOLID45	9.370	0.006
4	600	SOLID45	3.620	0.006
5	2872	SOLID45	17.210	0.006
6	1064	SOLID45	6.470	0.006

Time at end of element matrix formulation CP= 149.9.

Estimated number of active DOF= 37500.
Maximum wavefront= 1397.

Time at end of matrix triangularization CP= 233.84.

SUBSPACE SIZE OF 12 VECTORS USED FOR CALCULATION OF FIRST 8 EIGENVECTORS.
MAXIMUM ITERATIONS = 100
NUMBER OF EQUATIONS = 37500
MAXIMUM WAVEFRONT = 1397
ITERATIONS PER SHIFT = 5
MAXIMUM MODES STORED = 12
MAXIMUM EIGENVALUE = 0.10000E+07
WORK SPACE (MBYTE) = 8.0875

Equation solver maximum pivot= 1.429251269E+12 at node 8454 UX.

Equation solver minimum pivot= 1534600.89 at node 462 UY.

***** ITERATION 1 COMPLETE ***** CP= 2989.770 WALL= 22.9325

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO

1	24.072895	0.00000000E+00	0.10000E+01
2	30.534219	0.00000000E+00	0.10000E+01
3	32.760549	0.00000000E+00	0.10000E+01
4	40.345539	0.00000000E+00	0.10000E+01
5	47.959622	0.00000000E+00	0.10000E+01
6	51.498381	0.00000000E+00	0.10000E+01
7	53.895946	0.00000000E+00	0.10000E+01
8	63.760140	0.00000000E+00	0.10000E+01
9	67.432934	0.00000000E+00	0.10000E+01
10	71.863444	0.00000000E+00	0.10000E+01
11	82.152024	0.00000000E+00	0.10000E+01
12	86.795120	0.00000000E+00	0.10000E+01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 1
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2582.260
CP TIME SINCE LAST SHIFT= 169.580

***** ITERATION 2 COMPLETE ***** CP= 3156.170 WALL= 23.0781

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	19.041244	24.072895	0.59833E+00
2	25.509375	30.534219	0.43276E+00
3	28.831393	32.760549	0.29113E+00
4	31.418651	40.345539	0.64898E+00
5	35.106770	47.959622	0.86625E+00
6	37.983349	51.498381	0.83823E+00
7	38.983652	53.895946	0.91138E+00
8	43.896969	63.760140	0.11097E+01
9	45.305866	67.432934	0.12153E+01
10	50.226301	71.863444	0.10472E+01
11	52.179581	82.152024	0.14788E+01
12	61.620075	86.795120	0.98402E+00

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 2
NUMBER OF MODES CONVERGED= 0
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= -1.0000
CP TIME FOR TRIANGULARIZATION= 2582.260
CP TIME SINCE LAST SHIFT= 335.980

***** ITERATION 3 COMPLETE ***** CP= 3324.220 WALL= 23.2233

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
1	19.016423	19.041244	0.26122E-02
2	25.251633	25.509375	0.20518E-01
3	28.590891	28.831393	0.16894E-01
4	30.655267	31.418651	0.50425E-01
5	31.217594	35.106770	0.26469E+00
6	34.043363	37.983349	0.24486E+00
7	36.188598	38.983652	0.16044E+00
8	42.657493	43.896969	0.58957E-01
9	43.755305	45.305866	0.72130E-01
10	47.882079	50.226301	0.10031E+00
11	50.068697	52.179581	0.86097E-01
12	57.518681	61.620075	0.14770E+00

ITERATIONS SINCE LAST SHIFT= 3
TOTAL NUMBER OF ITERATIONS= 3
NUMBER OF MODES CONVERGED= 0

```
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  2582.260
CP TIME SINCE LAST SHIFT=        504.030


    *****  ITERATION    4  COMPLETE *****  CP=    3491.720  WALL=     23.3686

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   1      19.016201          19.016423          0.23333E-04
   2      25.240709          25.251633          0.86575E-03
   3      28.568283          28.590891          0.15833E-02
   4      30.025355          30.655267          0.42399E-01
   5      31.193599          31.217594          0.15391E-02
   6      33.860679          34.043363          0.10819E-01
   7      35.930079          36.188598          0.14442E-01
   8      42.357246          42.657493          0.14227E-01
   9      43.508304          43.755305          0.11386E-01
  10      47.436191          47.882079          0.18888E-01
  11      49.467876          50.068697          0.24439E-01
  12      55.471950          57.518681          0.75155E-01

ITERATIONS SINCE LAST SHIFT=     4
TOTAL NUMBER OF ITERATIONS=      4
NUMBER OF MODES CONVERGED=       0
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  2582.260
CP TIME SINCE LAST SHIFT=        671.530


    *****  ITERATION    5  COMPLETE *****  CP=    3659.050  WALL=     23.5147

     *****  CURRENT EIGENVALUE CALCULATIONS  *****
 MODE   CURRENT VALUE     PREVIOUS VALUE     CONVERGENCE RATIO
   1      19.016199          19.016201          0.25232E-06
   2      25.240208          25.240709          0.39695E-04
   3      28.566446          28.568283          0.12867E-03
   4      29.973321          30.025355          0.34750E-02
   5      31.192263          31.193599          0.85672E-04
   6      33.831481          33.860679          0.17268E-02
   7      35.886019          35.930079          0.24571E-02
   8      42.259295          42.357246          0.46410E-02
   9      43.453812          43.508304          0.25096E-02
  10      47.286594          47.436191          0.63373E-02
  11      49.207133          49.467876          0.10626E-01
  12      53.868806          55.471950          0.60406E-01

ITERATIONS SINCE LAST SHIFT=     5
TOTAL NUMBER OF ITERATIONS=      5
NUMBER OF MODES CONVERGED=       1
NUMBER OF WORKING VECTORS=      12
CURRENT SHIFT POINT=           -1.0000
CP TIME FOR TRIANGULARIZATION=  2582.260
CP TIME SINCE LAST SHIFT=        838.870

*** NOTE ***                          CP=   3659.060   TIME= 23:30:53
NEW SHIFT= 24.9658865.

*** NOTE ***                          CP=   6238.620   TIME= 01:19:35
STURM number= 1 should be 1.


    *****  ITERATION    6  COMPLETE *****  CP=    6392.400  WALL=     25.4578

    ******  PREVIOUS CONVERGED EIGENVALUES  *****
```

1 19.0161986

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
2	25.240183	25.240208	0.20265E-05
3	28.566299	28.566446	0.10237E-04
4	29.968136	29.973321	0.34608E-03
5	31.192135	31.192263	0.82310E-05
6	33.826207	33.831481	0.31183E-03
7	35.876875	35.886019	0.50983E-03
8	42.218784	42.259295	0.19200E-02
9	43.435659	43.453812	0.83606E-03
10	47.213617	47.286594	0.30938E-02
11	49.028357	49.207133	0.73061E-02
12	52.024483	53.868806	0.72159E-01

ITERATIONS SINCE LAST SHIFT= 1
TOTAL NUMBER OF ITERATIONS= 6
NUMBER OF MODES CONVERGED= 2
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 24.966
CP TIME FOR TRIANGULARIZATION= 2579.920
CP TIME SINCE LAST SHIFT= 153.420

***** ITERATION 7 COMPLETE ***** CP= 6540.210 WALL= 25.5847

****** PREVIOUS CONVERGED EIGENVALUES *****
1 19.0161986 2 25.2401825

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
3	28.566298	28.566299	0.66749E-07
4	29.968059	29.968136	0.51720E-05
5	31.192132	31.192135	0.16674E-06
6	33.825918	33.826207	0.17082E-04
7	35.876156	35.876875	0.40084E-04
8	42.209078	42.218784	0.45995E-03
9	43.431271	43.435659	0.20206E-03
10	47.185751	47.213617	0.11815E-02
11	48.916173	49.028357	0.45921E-02
12	50.545233	52.024483	0.59388E-01

ITERATIONS SINCE LAST SHIFT= 2
TOTAL NUMBER OF ITERATIONS= 7
NUMBER OF MODES CONVERGED= 5
NUMBER OF WORKING VECTORS= 12
CURRENT SHIFT POINT= 24.966
CP TIME FOR TRIANGULARIZATION= 2579.920
CP TIME SINCE LAST SHIFT= 301.230

***** ITERATION 8 COMPLETE ***** CP= 6665.060 WALL= 25.7050

****** PREVIOUS CONVERGED EIGENVALUES *****
1 19.0161986 2 25.2401825 3 28.5662985
4 29.9680587 5 31.1921319

***** CURRENT EIGENVALUE CALCULATIONS *****

MODE	CURRENT VALUE	PREVIOUS VALUE	CONVERGENCE RATIO
6	33.825903	33.825918	0.90184E-06
7	35.876100	35.876156	0.31182E-05
8	42.206747	42.209078	0.11045E-03
9	43.430102	43.431271	0.53846E-04
10	47.173637	47.185751	0.51364E-03
11	48.809217	48.916173	0.43874E-02
12	49.600584	50.545233	0.38453E-01

```
 ITERATIONS SINCE LAST SHIFT=     3
 TOTAL NUMBER OF ITERATIONS=      8
 NUMBER OF MODES CONVERGED=       7
 NUMBER OF WORKING VECTORS=      12
 CURRENT SHIFT POINT=            24.966
 CP TIME FOR TRIANGULARIZATION=  2579.920
 CP TIME SINCE LAST SHIFT=        426.080


     *****  ITERATION    9  COMPLETE *****  CP=    6780.120  WALL=     25.8161

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1  19.0161986           2  25.2401825           3  28.5662985
        4  29.9680587           5  31.1921319           6  33.8259027
        7  35.8761000

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
  MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
    8     42.206188         42.206747         0.26481E-04
    9     43.429785         43.430102         0.14590E-04
   10     47.167800         47.173637         0.24752E-03
   11     48.646995         48.809217         0.66805E-02
   12     49.163104         49.600584         0.17876E-01

 ITERATIONS SINCE LAST SHIFT=     4
 TOTAL NUMBER OF ITERATIONS=      9
 NUMBER OF MODES CONVERGED=       7
 NUMBER OF WORKING VECTORS=      12
 CURRENT SHIFT POINT=            24.966
 CP TIME FOR TRIANGULARIZATION=  2579.920
 CP TIME SINCE LAST SHIFT=        541.140


     *****  ITERATION   10  COMPLETE *****  CP=    6895.790  WALL=     25.9253

     ******  PREVIOUS CONVERGED EIGENVALUES  *****
        1  19.0161986           2  25.2401825           3  28.5662985
        4  29.9680587           5  31.1921319           6  33.8259027
        7  35.8761000

      *****  CURRENT EIGENVALUE CALCULATIONS  *****
  MODE  CURRENT VALUE    PREVIOUS VALUE    CONVERGENCE RATIO
    8     42.206055         42.206188         0.63024E-05

 *** NOTE ***                            CP=   6895.790   TIME= 01:55:31
 NEW SHIFT= 42.3300117.

 *** NOTE ***                            CP=   9476.990   TIME= 03:44:32
 STURM number= 8 should be 8.
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   03:44:35  JUN 09, 1996 CP=   9477.430
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

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  ***** FREQUENCIES FROM SUBSPACE ITERATION *****

  MODE    FREQUENCY (HERTZ)


    1       19.016199
    2       25.240183
    3       28.566298
    4       29.968059
    5       31.192132
```

```
   6       33.825903
   7       35.876100
   8       42.206055


  *** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37500
 R.M.S. WAVEFRONT SIZE =   902.2


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
      44.625 MB WRITTEN ON ELEMENT MATRIX FILE: seism4.emat
      29.703 MB WRITTEN ON ELEMENT SAVED DATA FILE: seism4.esav
      21.094 MB WRITTEN ON ASSEMBLED MATRIX FILE: seism4.full
       2.719 MB WRITTEN ON MODAL MATRIX FILE: seism4.mode

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      9485.070



*****  ANSYS SOLUTION ROUTINE  *****


PERFORM AN EXPANSION PASS


NUMBER OF MODES TO EXPAND=     8
 CALCULATE ELEMENT RESULTS AND NODAL DOF SOLUTION

*****  ANSYS SOLVE    COMMAND  *****
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   03:45:14  JUN 09, 1996 CP=   9485.080
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


                    S O L U T I O N   O P T I O N S

  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .MODAL
     EXTRACTION METHOD. . . . . .SUBSPACE
     EXPANSION PASS . . . . . .ON
  NUMBER OF MODES TO EXPAND . . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON

                  L O A D   S T E P   O P T I O N S

  LOAD STEP NUMBER. . . . . .     1
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY   COMPONENT
      ALL         ALL


*** NOTE ***                            CP=   9513.530   TIME= 03:46:42
Page file used.

  *** ELEMENT RESULT CALCULATION TIMES
 TYPE  NUMBER   ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       8.940    0.004
    3    1560  SOLID45       5.760    0.004
```

```
    4     600  SOLID45       2.110    0.004
    5    2872  SOLID45      10.770    0.004
    6    1064  SOLID45       4.150    0.004

  *** NODAL LOAD CALCULATION TIMES
 TYPE  NUMBER    ENAME      TOTAL CP  AVE CP

    2    2520  SOLID45       0.920    0.000
    3    1560  SOLID45       0.500    0.000
    4     600  SOLID45       0.250    0.000
    5    2872  SOLID45       0.920    0.000
    6    1064  SOLID45       0.350    0.000


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096
     106.109 MB WRITTEN ON RESULTS FILE: seism4.rst

FINISH SOLUTION PROCESSING


***** ROUTINE COMPLETED *****  CP =      9777.150



*****  ANSYS SOLUTION ROUTINE  *****


PERFORM A SPECTRUM ANALYSIS
 THIS WILL BE A NEW ANALYSIS

*** NOTE ***                                CP=   9777.160   TIME= 04:00:18
Some analysis options have been reset to their defaults.  Please verify
 current settings or respecify as required.


USE SINGLE POINT EXCITATION RESPONSE SPECTRUM
 USE ALL MODES FROM THE MODAL ANALYSIS
 INCLUDE STRESS RESPONSES IN THE CALCULATIONS

SEISMIC EXCITATION DIRECTION = 0.00000E+00  1.0000     0.00000E+00

SPECTRUM TYPE KEY=  2  FACTOR=  1.00000

FREQ= 0.100      100.     0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
NUMBER OF FREQUENCIES IN TABLE =  2

DAMPING= 0.00000E+00  SV=     16.285         16.285         0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00
                          0.00000E+00    0.00000E+00    0.00000E+00


COMBINE MODES USING THE SRSS METHOD
 WHOSE SIGNIFICANCE LEVEL EXCEEDS THE THRESHOLD OF  0.10000E-07

WRITE ALL  ITEMS TO THE DATABASE WITH A FREQUENCY OF      1
  FOR ALL APPLICABLE ENTITIES

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
 FOR POSSIBLE RESUME FROM THIS POINT

*****  ANSYS SOLVE    COMMAND  *****
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   04:01:03  JUN 09, 1996 CP=   9790.870
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill
```

S O L U T I O N O P T I O N S

```
  PROBLEM DIMENSIONALITY. . . . . .3-D
  DEGREES OF FREEDOM. . . . . UX   UY   UZ
  ANALYSIS TYPE . . . . . .SPECTRUM
     SPECTRUM TYPE. . . . . .SINGLE POINT
  NUMBER OF MODES TO BE USED. . . . . .     8
  ELEMENT RESULTS CALCULATION . . . . . .ON
```

L O A D S T E P O P T I O N S

```
  LOAD STEP NUMBER. . . . . .     1
  SPECTRUM LOADING TYPE . . . . . .ACCELERATION
  EXCITATION DIRECTION. . . . . 0.00000E+00  1.0000     0.00000E+00
  MODE COMBINATION TYPE . . . . . .SRSS
     SIGNIFICANCE LEVEL FOR COMBINATIONS. . . . . 0.10000E-07
  PRINT OUTPUT CONTROLS . . . . . .NO PRINTOUT
  DATABASE OUTPUT CONTROLS
     ITEM      FREQUENCY   COMPONENT
      ALL         ALL
```

1

```
***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303             VERSION=HP 9000/7XX   04:01:20  JUN 09, 1996 CP=   9795.190
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


  SIGNIFICANCE FACTOR FOR COMBINING MODES = 0.10000E-07
```

SIGNIFICANT MODE COEFFICIENTS (INCLUDING DAMPING)

MODE	FREQUENCY	DAMPING	SV	MODE COEF.
1	19.02	0.0000	16.285	0.1346E-02
2	25.24	0.0000	16.285	0.2067E-02
3	28.57	0.0000	16.285	0.3172E-01
4	29.97	0.0000	16.285	0.8336E-03
5	31.19	0.0000	16.285	0.1284E-02
6	33.83	0.0000	16.285	-0.1408E-02
7	35.88	0.0000	16.285	-0.1330E-01
8	42.21	0.0000	16.285	-0.4546E-03

MODAL COMBINATION COEFFICIENTS

MODE=	1	FREQUENCY=	19.016	COUPLING COEF.=	1.000
MODE=	2	FREQUENCY=	25.240	COUPLING COEF.=	1.000
MODE=	3	FREQUENCY=	28.566	COUPLING COEF.=	1.000
MODE=	4	FREQUENCY=	29.968	COUPLING COEF.=	1.000
MODE=	5	FREQUENCY=	31.192	COUPLING COEF.=	1.000
MODE=	6	FREQUENCY=	33.826	COUPLING COEF.=	1.000
MODE=	7	FREQUENCY=	35.876	COUPLING COEF.=	1.000
MODE=	8	FREQUENCY=	42.206	COUPLING COEF.=	1.000

```
SRSS COMBINATION INSTRUCTIONS WRITTEN ON FILE seism4.mcom


  *** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM =  37500
 R.M.S. WAVEFRONT SIZE =   902.2


*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED=  4096

FINISH SOLUTION PROCESSING
```

***** ROUTINE COMPLETED ***** CP = 9795.190

PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= seism4.db
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 1042
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

*** PAGE FILE USED ***
NUMBER OF R/W OPERATIONS= 790
MAXIMUM RECORD NUMBER = 599
RECORD SIZE (I*4 WORDS) = 16384
PAGE FILE SIZE (MB) = 37.438

ANSYS RUN COMPLETED

REV. 5.1 24 HP 9000/7XX

CP TIME (sec) = 9804.310 TIME = 04:01:47
ELAPSED TIME (sec) = 25694.000 DATE = 06/09/96

```
*------------------------------------------------------------------*
|                                                                  |
|        W E L C O M E   T O   T H E   A N S Y S   P R O G R A M    |
|                                                                  |
*------------------------------------------------------------------*
```

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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postf4
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.180   TIME= 13:11:55
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postf4    13:11:55  JUN 09, 1996 CP=      0.180

    1  resume,seism4,db
    2  /filnam,seism4
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /out,seism4,res
    7  /com, 100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
    8  /com,  90% Degradation of Inner Barrier
    9  /com,
   10  /com,
   11  /com, MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER
   12  /com,
   13  /com, No Outer Barrier
   14  !esel,s,type,,6,7
   15  !nsle
   16  !esln
   17  !set,1,5
   18  !nsort,s,int,0,0,1
   19  !prns,s,prin
   20
   21  /com,
   22  /com,
   23  /com, MAXIMUM STRESS INTENSITY IN THE INNER BARRIER
   24  /com,
   25  /com,
   26  esel,s,type,,5,6
   27  nsle
   28  esln
   29  nsort,s,int,0,0,1
   30  prns,s,prin
   31
   32  /com,
   33  /com,
   34  /com, MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES
   35  /com,
   36  /com,
   37  esel,s,type,,1
   38  esel,a,type,,3,4
   39  nsle
   40  esln
   41  nsort,s,int,0,0,1
   42  prns,s,prin
   43
   44  /com,
   45  /com,
   46  /com, MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES
   47  /com,
   48  /com,
   49  esel,s,type,,2
   50  nsle
```

```
   51  esln
   52  nsort,s,int,0,0,1
   53  prns,s,prin
   54
   55  /out
   56  fini
   57  /exit,nosave
   58  /eof

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI        =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,

ABBREVIATION= PR1       /psf,pres,norm,1,
```

```
 ABBREVIATION= PRO       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism4.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =      6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER        =       6
 ACTIVE COORDINATE SYSTEM              =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS       =    1191

 INITIAL JOBNAME = postf4
 CURRENT JOBNAME = postf4

 CURRENT JOBNAME REDEFINED AS seism4
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   13:12:08  JUN 09, 1996 CP=      5.870
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


          ***** ANSYS RESULTS INTERPRETATION (POST1) *****


 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 *** NOTE ***                            CP=      7.530   TIME= 13:12:12
 Page file used.

 SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
   TIME/FREQUENCY=  31.192
```

```
 TITLE=  21 PWR Tube Seismic Analysis With Backfill

 /INPUT FILE= seism4.mcom  LINE=       0
 ANSYS REVISION  5.1              24    04:01:20    06/09/1996
  seism4.mcom

 CURRENT LOAD SET IN DATABASE IS ERASED

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.13463E-02

 COPY LOAD CASE   1 FROM FILE TO DATABASE

 SQUARE THE CURRENT LOAD SET IN DATABASE

 *** NOTE ***                            CP=     33.910   TIME= 13:13:40
 Load case combination data may not be correct unless viewed in the
  solution phase coordinate system (RSYS=SOLU).

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.20674E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.20674E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.20674E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.31717E-01

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.31717E-01 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.31717E-01 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.83357E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.83357E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.83357E-03 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO 0.12844E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.12844E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.12844E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.14084E-02
```

```
LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.14084E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.14084E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.13298E-01

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.13298E-01 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.13298E-01 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO-0.45459E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.45459E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.45459E-03 ABS=   0

TAKE SQRT OF CURRENT LOAD SET IN DATABASE

/OUTPUT FILE= seism4.res

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       120.490


EXIT ANSYS WITHOUT SAVING DATABASE


NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        15583
MAXIMUM RECORD NUMBER   =          554
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       34.625

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =        120.520      TIME  =  13:19:51       |
|       ELAPSED TIME (sec) =        478.000      DATE  =  06/09/96       |
|                                                                        |
*------------------------------------------------------------------------*
```

```
*------------------------------------------------------------------*
|                                                                  |
|          W E L C O M E   T O   T H E   A N S Y S   P R O G R A M  |
|                                                                  |
*------------------------------------------------------------------*
```

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PRESS <CR> OR <ENTER> TO CONTINUE


        ***** ANSYS COMMAND LINE ARGUMENTS *****
 INITIAL JOBNAME            = postlin4
 MEMORY REQUESTED (MB)      =     64.0
 BATCH MODE REQUESTED       = LIST
 START-UP FILE MODE         = READ

*** NOTE ***                            CP=      0.210   TIME= 13:23:36
There are no parameters and no abbreviations defined.

38303            VERSION=HP 9000/7XX    REVISION= 5.1  24
FOR SUPPORT CALL ROBERT BAHNEY     PHONE (702) 794-5337    FAX (702) 794-1844
CURRENT JOBNAME=postlin4  13:23:36  JUN 09, 1996 CP=      0.220

    1  resume,seism4,db
    2  /filnam,seism4
    3  /post1
    4  set,1,5
    5  /input,,mcom
    6  /com, Outer Barrier Stress Distribution
    7  !nsel,s,node,,13294
    8  !nsel,a,node,,13367
    9  !nsel,a,node,,12430
   10  !nsel,a,node,,12503
   11  !nsel,a,node,,7840
   12  !esln
   13  !lpath,7840,13294
   14  !/out,obstress
   15  /com, Outer Barrier Linearized Stresses at Location of Peak Stress
   16  !prsect
   17  !/out
   18  !/show,obdist,grph
   19  !plsect,s,int
   20  !/show,term
   21  /com, Inner Barrier Stress Distribution
   22  nsel,s,node,,8632
   23  nsel,a,node,,8634
   24  nsel,a,node,,8626
   25  esln
   26  lpath,8632,8626
   27  /out,ibstress
   28  /com, Inner Barrier Linearized Stresses at Location of Peak Stress
   29  prsect
   30  /out
   31  /show,ibdist,grph
   32  plsect,s,int
   33  /show,term
   34  /com, Basket Stress Distribution
   35  nsel,s,node,,4355
   36  nsel,a,node,,4370
   37  nsel,a,node,,4293
   38  esln
   39  lpath,4355,4293
   40  /out,bktstress
   41  /com, Basket Tubes and Guides Linearized Stresses at Location of Peak Stress
   42  prsect
   43  /out
   44  /show,bktdist,grph
   45  plsect,s,int
   46  /show,term
   47  /com, Criticality Control Plate Stress Distribution
   48  nsel,s,node,,3878
   49  nsel,a,node,,3956
   50  nsel,a,node,,3830
```

```
   51  esln
   52  lpath,3878,3830
   53  /out,pltstress
   54  /com, Criticality Control Plates .inearized Stresses at Location of Peak Stress
   55  prsect
   56  /out
   57  /show,pltdist,grph
   58  plsect,s,int
   59  /show,term
   60  fini
   61  /exit,nosave

RUN SETUP PROCEDURE FROM FILE= /ansys51/docu/start.ans

/INPUT FILE= /ansys51/docu/start.ans  LINE=       0

ABBREVIATION= REPLOT    /REPLOT

PARAMETER PI       =     3.141593
   ***************************************************************
   ANSYS STARTUP FILE  start.ans
   ***************************************************************

ABBREVIATION= VEC       /show,,,1,

ABBREVIATION= RAS       /show,,,0,

ABBREVIATION= INP       /input,,inp,

ABBREVIATION= ESC       /exit,nosav,

ABBREVIATION= K1        /pnum,kp  ,1,

ABBREVIATION= K0        /pnum,kp  ,0,

ABBREVIATION= L1        /pnum,line,1,

ABBREVIATION= L0        /pnum,line,0,

ABBREVIATION= A1        /pnum,area,1,

ABBREVIATION= A0        /pnum,area,0,

ABBREVIATION= V1        /pnum,volu,1,

ABBREVIATION= V0        /pnum,volu,0,

ABBREVIATION= N1        /pnum,node,1,

ABBREVIATION= N0        /pnum,node,0,

ABBREVIATION= E1        /pnum,elem,1,

ABBREVIATION= E0        /pnum,elem,0,

ABBREVIATION= M1        /pnum,mat ,1,

ABBREVIATION= M0        /pnum,mat ,0,

ABBREVIATION= R1        /pnum,real,1,

ABBREVIATION= R0        /pnum,real,0,

ABBREVIATION= T1        /pnum,type,1,

ABBREVIATION= T0        /pnum,type,0,

ABBREVIATION= C1        /number,1,

ABBREVIATION= C0        /number,0,
```

```
 ABBREVIATION= PR1       /psf,pres,norm,1,

 ABBREVIATION= PR0       /psf,pres,norm,0,

 ABBREVIATION= U1        /pbc,u,1,

 ABBREVIATION= U0        /pbc,u,0,

 ABBREVIATION= X3D       /show,3d,

 ABBREVIATION= X11       /show,x11,

 ABBREVIATION= X11C      /show,x11c,

 ABBREVIATION= ON        /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

 VIEW CONE ANGLE FOR WINDOW  1   25.00
    ********************************************************************
    END  start.ans
    ********************************************************************

    To start ANSYS menu:

    type:   x3d  for console
            x11  for X-term color
            x11c for X-term color contour

    type:   on

    ********************************************************************

 RESUME ANSYS DATA FROM FILE NAME=seism4.db

 *** ANSYS GLOBAL STATUS ***

 TITLE =  21 PWR Tube Seismic Analysis With Backfill
 ANALYSIS TYPE =  SPECTRUM
 NUMBER OF ELEMENT TYPES =     6
   8616 ELEMENTS CURRENTLY SELECTED.  MAX ELEMENT NUMBER  =   8616
  12897 NODES CURRENTLY SELECTED.     MAX NODE NUMBER     =  12897
    690 KEYPOINTS CURRENTLY SELECTED. MAX KEYPOINT NUMBER =   9001
   1604 LINES CURRENTLY SELECTED.     MAX LINE NUMBER     =   1604
   1133 AREAS CURRENTLY SELECTED.     MAX AREA NUMBER     =   1133
    269 VOLUMES CURRENTLY SELECTED.   MAX VOL. NUMBER     =    269
 MAXIMUM LINEAR PROPERTY NUMBER       =       6
 ACTIVE COORDINATE SYSTEM             =       0  (CARTESIAN)
 NUMBER OF SPECIFIED CONSTRAINTS      =    1191

 INITIAL JOBNAME = postlin4
 CURRENT JOBNAME = postlin4

 CURRENT JOBNAME REDEFINED AS seism4
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303            VERSION=HP 9000/7XX   13:23:50  JUN 09, 1996 CP=      5.960
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


         ***** ANSYS RESULTS INTERPRETATION (POST1) *****


 USE LOAD STEP     1  SUBSTEP     5  FOR LOAD CASE 0

 *** NOTE ***                            CP=       7.700   TIME= 13:23:53
 Page file used.
```

```
SET COMMAND GOT LOAD STEP=     1  SUBSTEP=     5  CUMULATIVE ITERATION=     5
  TIME/FREQUENCY=  31.192
TITLE=  21 PWR Tube Seismic Analysis With Backfill

/INPUT FILE= seism4.mcom  LINE=       0
ANSYS REVISION  5.1              24    04:01:20    06/09/1996
 seism4.mcom

CURRENT LOAD SET IN DATABASE IS ERASED

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     1  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.13463E-02

COPY LOAD CASE   1 FROM FILE TO DATABASE

SQUARE THE CURRENT LOAD SET IN DATABASE

*** NOTE ***                            CP=     34.890   TIME= 13:25:26
Load case combination data may not be correct unless viewed in the
 solution phase coordinate system (RSYS=SOLU).

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     2  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.20674E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.20674E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.20674E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     3  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.31717E-01

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.31717E-01 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.31717E-01 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     4  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.83357E-03

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.83357E-03 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.83357E-03 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     5  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill


LOAD CASE   1 FACTOR SET TO 0.12844E-02

LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR= 0.12844E-02 ABS=   0
MULTIPLIED BY LOAD CASE=   1 FACTOR= 0.12844E-02 ABS=   0

LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     6  COMPLEX=  0
FILE= seism4.rst
 21 PWR Tube Seismic Analysis With Backfill
```

```
 LOAD CASE   1 FACTOR SET TO-0.14084E-02

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.14084E-02 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.14084E-02 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     7  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.13298E-01

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.13298E-01 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.13298E-01 ABS=   0

 LOAD CASE   1 IS LOAD STEP     1  SUBSTEP     8  COMPLEX=  0
 FILE= seism4.rst
  21 PWR Tube Seismic Analysis With Backfill


 LOAD CASE   1 FACTOR SET TO-0.45459E-03

 LCOPER OPERATION ADD  USING LOAD CASE=   1 FACTOR=-0.45459E-03 ABS=   0
 MULTIPLIED BY LOAD CASE=   1 FACTOR=-0.45459E-03 ABS=   0

 TAKE SQRT OF CURRENT LOAD SET IN DATABASE
  Outer Barrier Stress Distribution
  Outer Barrier Linearized Stresses at Location of Peak Stress
  Inner Barrier Stress Distribution

 SELECT       FOR ITEM=NODE COMPONENT=
  IN RANGE    8632 TO     8632 STEP       1

      1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    8634 TO     8634 STEP       1

      2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 ALSO SELECT  FOR ITEM=NODE COMPONENT=
  IN RANGE    8626 TO     8626 STEP       1

      3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

      8 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
      3 SELECTED NODES BY  ESLN COMMAND.

 DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
       8632  8626

 /OUTPUT FILE= ibstress

 /SHOW SWITCH PLOTS TO FILE ibdist.grph       - RASTER MODE.

 DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
  ITEM=S    COMP=INT RHO= 0.00000E+00

 CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE ibdist.grph       - RASTER MODE.
 DISPLAY TITLE=
  21 PWR Tube Seismic Analysis With Backfill
  Basket Stress Distribution

 SELECT       FOR ITEM=NODE COMPONENT=
  IN RANGE    4355 TO     4355 STEP       1

      1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.
```

```
ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    4370 TO     4370 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    4293 TO     4293 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT       ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

    10 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      4355  4293

/OUTPUT FILE= bktstres

/SHOW SWITCH PLOTS TO FILE bktdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE bktdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill
 Criticality Control Plate Stress Distribution

SELECT       FOR ITEM=NODE COMPONENT=
 IN RANGE    3878 TO     3878 STEP        1

     1  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    3956 TO     3956 STEP        1

     2  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

ALSO SELECT  FOR ITEM=NODE COMPONENT=
 IN RANGE    3830 TO     3830 STEP        1

     3  NODES (OF  12897  DEFINED) SELECTED BY  NSEL  COMMAND.

SELECT       ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

     4 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
     3 SELECTED NODES BY  ESLN COMMAND.

DEFINE A PATH FOR SUBSEQUENT CALCULATIONS THROUGH NODES:
      3878  3830

/OUTPUT FILE= pltstres

/SHOW SWITCH PLOTS TO FILE pltdist.grph      - RASTER MODE.

DISPLAY LINEARIZED STRESS USING NODES DEFINED BY LPATH COMMAND.
 ITEM=S    COMP=INT RHO= 0.00000E+00

CUMULATIVE DISPLAY NUMBER   1 WRITTEN TO FILE pltdist.grph      - RASTER MODE.
DISPLAY TITLE=
 21 PWR Tube Seismic Analysis With Backfill

EXIT THE ANSYS POST1 DATABASE PROCESSOR


***** ROUTINE COMPLETED *****  CP =       114.920
```

```
EXIT ANSYS WITHOUT SAVING DATABASE

NUMBER OF WARNING MESSAGES ENCOUNTERED=          0
NUMBER OF ERROR   MESSAGES ENCOUNTERED=          0

***  PAGE FILE USED  ***
NUMBER OF R/W OPERATIONS=        14517
MAXIMUM RECORD NUMBER   =          529
RECORD SIZE (I*4 WORDS) =        16384
PAGE FILE SIZE (MB)     =       33.063

*------------------------------------------------------------------------*
|                                                                        |
|                          ANSYS RUN COMPLETED                           |
|                                                                        |
|------------------------------------------------------------------------|
|                                                                        |
|              REV. 5.1   24                    HP 9000/7XX              |
|                                                                        |
|       CP TIME      (sec) =        114.950     TIME  =  13:30:55        |
|       ELAPSED TIME (sec) =        440.000     DATE  =  06/09/96        |
|                                                                        |
*------------------------------------------------------------------------*
```

```
/COM,ANSYS REVISION  5.1              24    04:01:20    06/09/1996
/COM, seism4.mcom
LCOPER,ZERO
LCDEFI,1,     1,     1
LCFACT,1,  0.134627E-02
LCASE,1
LCOPER,SQUARE
LCDEFI,1,     1,     2
LCFACT,1,  0.206741E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     3
LCFACT,1,  0.317170E-01
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     4
LCFACT,1,  0.833568E-03
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     5
LCFACT,1,  0.128438E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     6
LCFACT,1, -0.140839E-02
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     7
LCFACT,1, -0.132977E-01
LCOPER,ADD,1,MULT,1
LCDEFI,1,     1,     8
LCFACT,1, -0.454585E-03
LCOPER,ADD,1,MULT,1
LCOPER,SQRT
```

100% Degradation of Outer Barrier, Backfill Present, Supports in From Ends
90% Degradation of Inner Barrier

MAXIMUM STRESS INTENSITY IN THE OUTER BARRIER

No Outer Barrier

MAXIMUM STRESS INTENSITY IN THE INNER BARRIER

```
SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       5 TO        6 STEP        1

  3936  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

  6129 NODES (OF  12897  DEFINED) SELECTED FROM
  3936 SELECTED ELEMENTS BY NSLE COMMAND.

SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

  4296 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
  6129 SELECTED NODES BY  ESLN COMMAND.

SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

SORT COMPLETED FOR     1 VALUES.

PRINT S    NODAL SOLUTION PER NODE
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
38303            VERSION=HP 9000/7XX   13:19:26  JUN 09, 1996 CP=    113.940
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

 21 PWR Tube Seismic Analysis With Backfill


 ***** POST1 NODAL STRESS LISTING *****

 CALCULATED LOAD CASE=     0

  NODE    S1          S2          S3          SINT        SEQV
  8632  0.53173E+09 0.16963E+09 0.99791E+08 0.43194E+09 0.40160E+09

MINIMUM VALUES
NODE      8632        8632        8632        8632        8632
VALUE   0.53173E+09 0.16963E+09 0.99791E+08 0.43194E+09 0.40160E+09

MAXIMUM VALUES
NODE      8632        8632        8632        8632        8632
VALUE   0.53173E+09 0.16963E+09 0.99791E+08 0.43194E+09 0.40160E+09


 MAXIMUM STRESS INTENSITY IN BASKET TUBES, CORNER GUIDES, AND END GUIDES


SELECT       FOR ITEM=TYPE COMPONENT=
 IN RANGE       1 TO        1 STEP        1

     0  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

ALSO SELECT  FOR ITEM=TYPE COMPONENT=
 IN RANGE       3 TO        4 STEP        1
```

```
  2160  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

   3632 NODES (OF  12897  DEFINED) SELECTED FROM
   2160 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

   3040 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
   3632 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   13:19:41  JUN 09, 1996 CP=    117.420
 FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337   FAX (702) 794-1844

  21 PWR Tube Seismic Analysis With Backfill


  ***** POST1 NODAL STRESS LISTING *****

  CALCULATED LOAD CASE=     0

   NODE    S1          S2          S3          SINT        SEQV
   4355  0.25244E+09 0.71271E+08 0.32077E+08 0.22036E+09 0.20361E+09

 MINIMUM VALUES
 NODE      4355        4355        4355        4355        4355
 VALUE   0.25244E+09 0.71271E+08 0.32077E+08 0.22036E+09 0.20361E+09

 MAXIMUM VALUES
 NODE      4355        4355        4355        4355        4355
 VALUE   0.25244E+09 0.71271E+08 0.32077E+08 0.22036E+09 0.20361E+09


  MAXIMUM STRESS INTENSITY IN CRITICALITY CONTROL PLATES


 SELECT       FOR ITEM=TYPE COMPONENT=
  IN RANGE       2 TO        2 STEP       1

   2520  ELEMENTS (OF   8616  DEFINED) SELECTED BY  ESEL  COMMAND.

 SELECT      ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

   4000 NODES (OF  12897  DEFINED) SELECTED FROM
   2520 SELECTED ELEMENTS BY NSLE COMMAND.

 SELECT      ALL ELEMENTS HAVING ANY NODE IN NODAL SET.

   2910 ELEMENTS (OF   8616  DEFINED) SELECTED FROM
   4000 SELECTED NODES BY  ESLN COMMAND.

 SORT ON ITEM=S     COMPONENT=INT   ORDER= 0  KABS= 0  NMAX=     1

 SORT COMPLETED FOR     1 VALUES.

 PRINT S    NODAL SOLUTION PER NODE
1

 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM  REVISION 5.1  24 *****
 38303             VERSION=HP 9000/7XX   13:19:50  JUN 09, 1996 CP=    120.450
```

FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

21 PWR Tube Seismic Analysis With Backfill

***** POST1 NODAL STRESS LISTING *****

CALCULATED LOAD CASE= 0

NODE	S1	S2	S3	SINT	SEQV
3878	0.25681E+08	0.22518E+07	0.13202E-07	0.24361E+08	0.23909E+08

MINIMUM VALUES					
NODE	3878	3878	3878	3878	3878
VALUE	0.25681E+08	0.22518E+07	0.13202E-07	0.24361E+08	0.23909E+08
MAXIMUM VALUES					
NODE	3878	3878	3878	3878	3878
VALUE	0.25681E+08	0.22518E+07	0.13202E-07	0.24361E+08	0.23909E+08