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Design Analysis Cover Sheet

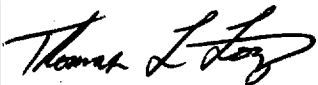
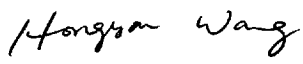
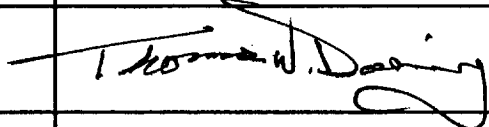
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2. DESIGN ANALYSIS TITLE			
Thermal Evaluation of the Conceptual DHLW Disposal Container Loaded with Pu/Cs Greenfield Glass			(SCPB: N/A)
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14. REMARKS

This is an approved SCOPING Design Analysis. The QAP 2-0 Activity Evaluation, "Studies Not Supported by the Office of Civilian Radioactive Waste Management", DI#: BB0000000-01717-2200-00035 REV 01, lists the procedural controls which are required. Therefore, this design analysis is NOT subject to the QAP 3-series procedures and does not require QAP 3-9 signatures. All information contained in this analysis is TBV and has received a technical review only.

Design Analysis Revision Record

Complete only applicable items.

1.

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DESIGN ANALYSIS

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Title: Thermal Evaluation of the Conceptual DHLW Disposal Container
Loaded with Pu/Cs Greenfield Glass (SCPB: N/A)

Document Identifier: BBAC00000-01717-0200-00003 REV 00

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Date: November 13, 1995

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1. Purpose

This analysis is prepared by the Mined Geologic Disposal System (MGDS) Waste Package Development Department (WPDD) as specified in the Waste Package Implementation Plan (pp. 4-8, 4-11, 4-24, 5-1, and 5-13; Ref. 5.10) and Waste Package Plan (pp. 3-15, 3-17, and 3-24; Ref. 5.9). The design data request addressed herein is:

- 1) Characterize the conceptual Defense High Level Waste (DHLW) Disposal Container design to show that the design is feasible for use in the MGDS environment when loaded with a plutonium/cesium greenfield glass waste form.

The purpose of this analysis is to respond to a concern that the long-term disposal thermal issues for the conceptual DHLW disposal container design do not preclude compatibility with the MGDS if it is loaded with alternate waste forms. The objective of this analysis is to provide thermal parameter information for the conceptual DHLW disposal container design loaded with an alternative waste form containing a plutonium/cesium mixture under nominal MGDS repository conditions. The results are intended to show that the design loaded with this alternative waste form has a reasonable chance to meet the MGDS design requirements for normal MGDS operation and to provide the required guidance to determining the major design issues for future design efforts. Future design efforts will focus on specific DHLW vendor designs and improved waste form data when they become available.

2. Quality Assurance

The QA program does not apply to this analysis. The information in this analysis concerning disposal long-term thermal parameters for the conceptual DHLW disposal container will be used as a guide as to the possible requirements which might be used in the DHLW disposal container design. The performance of the DHLW disposal container internals will affect the proper function of the waste package and the waste package has been identified as an MGDS Q-List item important to safety (Ref. 5.4, p. 5). The work performed for this analysis is covered by reference 5.2, "Studies Not Supported By the Office of Civilian Radioactive Waste Management", which is part the WPDD QAP-2-0 Work Control evaluation documents. This QAP-2-0 evaluation determined such activities are not subject to Quality Assurance Requirements and Description (QARD) (Ref. 5.3) requirements and applicable procedural controls are listed in the QAP-2-0 evaluation (Ref. 5.2).

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3. Method

The analytical method to be employed is Finite Element Analysis (FEA). The analysis will build upon the Emplacement Scale Thermal Evaluations (Ref. 5.13) by using the results for the drift wall surface temperatures from the three-dimensional emplacement scale model. The DHLW pour canister is modeled in three dimensions as the SRP design presented in references 5.12 (pp. 3.3-4 and 3.3-5) and 5.33. The SRP pour canister is inside the disposal container which is placed between two SNF waste packages in the MGDS drift. The drift wall is modeled as a shell which holds the boundary condition. Radiation is modeled between the pour canisters and the inside of the disposal container as well as between the outside of the disposal container and the drift wall. The calculation shall be performed in order to evaluate the first 1000 years of proposed repository operation.

4. Design Inputs

4.1 Design Parameters

Tables 4.1-1 and 4.1-2 list the material and thermal properties of density, emissivity, thermal conductivity, and specific heat of stainless steel 316 (see assumption 4.3.28). The density of 316 stainless steel provided in Table 4.1-1 was taken from Table 17 of the Metals Handbook (p. 423, Ref. 5.18). The emissivity provided in Table 4.1-1 was taken from Table 4.3.2 of Marks' Handbook (p. 4-68, Ref. 5.17) and is about average for heated stainless steel 316.

Table 4.1-1. Material Properties of Stainless Steel 316 (Refs. 5.17 and 5.18)

	Density	Emissivity
Stainless Steel 316	8000.0 kg/m ³	0.60

Table 4.1-2 lists the thermal properties of stainless steel 316. Values for thermal conductivity and thermal diffusivity of stainless steel 316 (Cr-Ni-Mo) were taken from Table I-4.0, Appendix I of the 1986 ASME Boiler and Pressure Vessel Code (p. 97, Ref. 5.15) and are converted here to conductivity and specific heat in SI units. The conversion of thermal diffusivity (defined in equation 4.1-1 below) to specific heat requires the density listed in Table 4.1-1.

Table 4.1-2. Thermal Properties of Stainless Steel 316 (Ref. 5.15)

Temperature		Thermal Conductivity (Btu/hr-ft-°F)	Thermal Diffusivity (ft²/hr)	Thermal Conductivity (W/m-K)	Specific Heat (J/kg-K)
°F	°C				
70	21.11	7.7	0.134	13.33	481.68
100	37.78	7.9	0.136	13.67	486.92
150	65.56	8.2	0.138	14.19	498.09
200	93.33	8.4	0.141	14.54	499.38
250	121.11	8.7	0.143	15.06	509.98
300	148.89	9.0	0.145	15.58	520.29
350	176.67	9.2	0.148	15.92	521.07
400	204.44	9.5	0.151	16.44	527.38
450	232.22	9.8	0.153	16.96	536.92
500	260.00	10.0	0.156	17.31	537.34
550	287.78	10.3	0.159	17.83	543.02
600	315.56	10.5	0.162	18.17	543.31
650	343.33	10.7	0.164	18.52	546.91
700	371.11	11.0	0.167	19.04	552.14
750	398.89	11.2	0.170	19.38	552.26
800	426.67	11.5	0.173	19.90	557.22
850	454.44	11.7	0.176	20.25	557.25
900	482.22	12.0	0.178	20.77	565.11
950	510.00	12.2	0.181	21.11	565.01
1000	537.78	12.4	0.184	21.46	564.91
1050	565.56	12.7	0.186	21.98	572.35
1100	593.33	12.9	0.189	22.33	572.14
1150	621.11	13.1	0.191	22.67	574.92
1200	648.89	13.3	0.194	23.02	574.68
1250	676.67	13.6	0.196	23.54	581.64
1300	704.44	13.8	0.199	23.88	581.30
1350	732.22	14.0	0.201	24.23	583.86
1400	760.00	14.2	0.203	24.58	586.36
1450	787.78	14.4	0.206	24.92	585.96
1500	815.56	14.6	0.208	25.27	588.39

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Table 4.1-3. Thermal Properties of Alloy 825 (Ref. 5.15)

Temperature		Thermal Conductivity (Btu/hr-ft-°F)	Thermal Diffusivity (ft²/hr)	Thermal Conductivity (W/m-K)	Specific Heat (J/kg-K)
°F	°C				
200	93.33	7.1	0.127	12.29	460.69
250	121.11	7.3	0.126	12.63	477.42
300	148.89	7.6	0.125	13.15	501.02
350	176.67	7.9	0.129	13.67	504.65
400	204.44	8.1	0.134	14.02	498.12
450	232.22	8.4	0.133	14.54	520.45
500	260.00	8.6	0.132	14.88	536.88
550	287.78	8.9	0.131	15.40	559.85
600	315.56	9.1	0.130	15.75	576.83
650	343.33	9.3	0.133	16.10	576.21
700	371.11	9.6	0.136	16.61	581.68
750	398.89	9.8	0.135	16.96	598.20
800	426.67	10.0	0.133	17.31	619.58
850	454.44	10.2	0.132	17.65	636.76
900	482.22	10.4	0.131	18.00	654.20
950	510.00	10.7	0.130	18.52	678.25
1000	537.78	10.9	0.129	18.86	696.29
1050	565.56	11.1		19.21	
1100	593.33	11.4		19.73	
1150	621.11	11.6		20.08	
1200	648.89	11.8		20.42	
1250	676.67	12.1		20.94	
1300	704.44	12.4		21.46	
1350	732.22	12.7		21.98	
1400	760.00	12.9		22.33	
1450	787.78	13.3		23.02	
1500	815.56	13.6		23.54	

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$$\text{Thermal Diffusivity}(\text{ft}^2/\text{hr}) = \frac{\text{Thermal Conductivity}(\text{Btu}/\text{hr}\cdot\text{ft}\cdot^\circ\text{F})}{\text{Density}(\text{lb}/\text{ft}^3) \times \text{Specific Heat}(\text{Btu}/\text{lb}\cdot^\circ\text{F})}$$

(Equation 4.1-1)

Tables 4.1-3 and 4.1-4 list the material and thermal properties of density, emissivity, thermal conductivity, and specific heat of Alloy 825 (see assumption 4.3.29). The density of Alloy 825 (Ni-Fe-Cr-Mo-Cu) provided in Table 4.1-4 was taken from the product specifications published by the manufacturer; Huntington Alloys (p. 31, Ref. 5.19). The emissivity of Alloy 825 (Ni-Fe-Cr-Mo-Cu) provided in Table 4.1-4 was taken from the LLNL report on the Thermal Performance of a Buried Nuclear Waste Storage Container Storing a Hybrid Mix of PWR and BWR Spent Fuel Rods. (p. 15, Ref. 5.20).

Table 4.1-4. Material Properties of Alloy 825 (Refs. 5.19 and 5.20)

	Density	Emissivity
Alloy 825	8137.9 kg/m ³	0.80

Table 4.1-3 lists the thermal properties of Alloy 825. Values for thermal conductivity and thermal diffusivity of Alloy 825 (Ni-Fe-Cr-Mo-Cu) were taken from Table I-4.0, Appendix I of the 1986 ASME Boiler and Pressure Vessel Code (p. 97, Ref. 5.15) and are converted here to conductivity and specific heat in SI units. The conversion of thermal diffusivity (defined in equation 4.1-1) to specific heat requires the density listed in Table 4.1-4.

Table 4.1-5 lists the thermal properties of helium (see assumption 4.3.27). Values for thermal conductivity and thermal diffusivity of helium were taken from Table A.4, Appendix A of a standard heat transfer text (p. 683, Ref. 5.16). Indicated values were linearly interpolated from the data supplied in the reference.

Table 4.1-5. Thermal Properties of Helium (Ref. 5.16)

Temperature		Helium Density (kg/m ³)	Thermal Conductivity (W/m-K)	Specific Heat (J/kg-K)
K	°C			
260	-13.15	0.1875	0.137	5193.0
280	6.85	0.1750*	0.145	5193.0
300	26.85	0.1625	0.152	5193.0
350	76.85	0.1422*	0.170	5193.0
400	126.85	0.1219	0.187	5193.0
450	176.85	0.1097*	0.204	5193.0
500	226.85	0.0975	0.220	5193.0
550	276.85	0.0906*	0.236*	5193.0
600	326.85	0.0836*	0.252	5193.0
650	376.85	0.0767*	0.264	5193.0
700	426.85	0.0697	0.278	5193.0
750	476.85	0.0662*	0.291	5193.0
800	526.85	0.0627*	0.304	5193.0
900	626.85	0.0558*	0.330	5193.0
1000	726.85	0.0488	0.354	5193.0

* Values marked with an * were linearly interpolated from the table because values were not given.

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Table 4.1-6 lists the thermal properties of C71500 70/30 Copper-Nickel Alloy (see assumption 4.3.30). Values for thermal conductivity for C71500 70/30 Copper-Nickel Alloy were taken from Tables 2-46 and 2-48 of a report issued by Yucca Mountain Site Characterization Project which provided basic design data (p. 44, Ref. 5.22). The density and specific heat of C71500 70/30 Copper-Nickel Alloy were taken from Table 2-46 of the same report (p. 43, Ref. 5.22).

Table 4.1-6. Thermal Properties of C71500 70/30 Copper-Nickel Alloy (Ref. 5.22)

Temperature		C71500 Density (lb/in ³)	C71500 Density (kg/m ³)	Thermal Conductivity (BTU/ hr·ft ·°F)	Thermal Conductivity (W/m·K)	Specific Heat (Btu/ lb·°F)	Specific Heat (J/kg·K)
°F	°C						
68.0	20	0.323	8940.64	17.0	29.42	0.09	376.79
212.0	100			16.9	29.25		
392.0	200			19.7	34.09		
572.0	300			22.3	38.59		
752.0	400			24.9	43.09		
832.0	500			27.8	48.11		
1112.0	600			30.7	53.13		
1292.0	700			33.6	58.15		

The emissivity of C71500 70/30 Copper-Nickel Alloy was not available as indicated in Table 2-46 of reference 5.22. Thus, the emissivity of C71500 will need to be approximated (see assumption 4.3.30). Reference 5.16 (p. 787, Table A.11) indicates the emissivity of oxidized nickel at 600 K (327°C) to be 0.40 and the emissivity of oxidized copper at 600 K (327°C) to be 0.50. The analysis presented here uses the emissivity of oxidized nickel to approximate the emissivity of C71500 (see assumption 4.3.30).

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Table 2 of Section 1.12 of the Yucca Mountain Project Reference Information Base (RIB, p.5, Ref. 5.11) provides corrected depths to rock unit lower contacts from borehole USW G-4 (see assumption 4.3.31). These depths are listed here in Table 4.1-7 for the rock units considered in this analysis (see assumption 4.3.31). Table 2 of Section 1.1326 of the RIB (p.9, Ref. 5.11) provides mean-value in-situ-saturation estimates for the rock mass thermal conductivity for some of the rock units. These values are also listed here in Table 4.1-7 and in reference 5.13.

Table 4.1-7, Stratigraphy for Borehole USW G-4 (Ref. 5.11 and 5.13)

Rock Unit	Corrected Lower Contact	Thermal Conductivity
Ground Level	0 m (0 ft)	N/A
Undifferentiated Overburden	9.1 m (30 ft)	(see ref. 5.13)
TCw Lithophysae Poor TCw Lithophysae Rich (TCw Average)	36.0 m (118 ft)	1.73 W/m-K 1.59 W/m-K (1.66 W/m-K) (see ref. 5.13)
PTn Welded, Devitrified PTn Non-welded or Bedded	74.1 m (243 ft)	1.60 W/m-K 0.85 W/m-K (see ref. 5.13)
TSw1 Lithophysae Poor TSw1 Lithophysae Rich (TSw1 Average)	204.2 m (670 ft)	1.70 W/m-K 1.60 W/m-K (1.65 W/m-K) (see 5.13)
TSw2	393.5 m (1291 ft)	2.10 W/m-K
TSw3	409.3 m (1343 ft)	1.28 W/m-K
CHn1v	414.5 m (1360 ft)	1.20 W/m-K
CHn1z	518.5 m (1701 ft)	1.28 W/m-K
CHn2v CHn2z (CHn2 Average)	535.2 m (1756 ft) (see ref. 5.13)	1.20 W/m-K 1.56 W/m-K (1.38 W/m-K) (see ref. 5.13)

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Table 6 of Section 1.1326 of the RIB (p.11, Ref. 5.11) gives the thermal capacitance of the rock mass at selected temperatures for nine of the thermal/mechanical rock units. They are repeated here in Table 4.1-8. Thermal capacitance is the product of specific heat and density. Therefore, for the emplacement thermal model, the below values were converted to $\text{J/m}^3\cdot\text{K}$ (multiplied by 1×10^6) and entered as temperature-dependent specific heats with all rock densities equal to 1.0 kg/m^3 (see assumption 4.3.31 and reference 5.13).

Table 4.1-8, Thermal Capacitance of Rock Units ($\text{J/cm}^3\cdot\text{K}$) (Ref. 5.11 and 5.13)

Temp.	TCw	PTn	TSw1	TSw2	TSw3	CHn1v	CHn2v	CHn2*
25°C	1.9263	2.1164	1.9779	2.0324	1.8443	2.4436	2.6032	2.4309
50°C	2.0183	2.2196	2.0654	2.1280	2.0315	2.5557	2.6647	2.5385
94°C	2.1494	2.3498	2.1891	2.2638	2.2831	2.6960	2.7447	2.6803
95°C	9.6274	30.3260	12.6294	10.7683	4.5590	36.6013	36.6069	27.9869
105°C	9.3665	29.2767	12.2534	10.4690	4.5188	35.3263	35.3440	27.0553
114°C	9.1306	28.3302	11.9138	10.1984	4.4800	34.1764	34.2053	26.2146
115°C	1.9278	1.3695	1.8555	2.0065	2.2953	1.5013	2.7914	2.5644
155°C	2.0272	1.4612	1.9641	2.1114	2.4489	1.6018	2.7419	2.5935
195°C	2.1053	1.5358	2.0264	2.1912	2.5740	1.6836	2.6707	2.5985
235°C	2.1802	1.5986	2.0985	2.2692	2.6792	1.7525	1.5814	1.9820
275°C	2.2492	1.6529	2.1649	2.3410	2.7702	1.8120	1.6320	2.0474

* CHn2 values are the average of CHn2v and CHn2z (see Assumption 4.3.31)

Table 4.1-9 lists the thermal properties of typical concrete to be used as the drift invert (see assumption 4.3.32). These values were taken from Tables A.3 and A.11 of a standard heat transfer textbook (pp.773 & 788, Ref. 5.16) for a temperature of 300 K. These values are also used in the analysis presented in reference 5.13.

Table 4.1-9, Material Properties of Concrete Invert (Ref. 5.16 and 5.13)

	Conductivity	Density	Specific Heat	Emissivity
Concrete Invert	1.4 $\text{W/m}\cdot\text{K}$	2300.0 kg/m^3	880.0 $\text{J/kg}\cdot\text{K}$	0.88

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Table 4.1-10 lists the thermal properties of pyrex glass to be used as an approximation to borosilicate glass (see assumption 4.3.33). The values for density and specific heat were taken from Table A.3 of a standard heat transfer textbook (p.774, Ref. 5.16) for a temperature of 300°K. The value for emissivity was taken from Table A.11 of a standard heat transfer textbook (p. 778, Ref. 5.16) and represent an average of the emissivities for the temperatures of 300 K (0.82) and 600 K (0.80). The value for thermal conductivity is the mid-range value for borosilicate glass reported in Table 11.7 (p.584) of reference 5.8 for a temperature range of 100°C to 500°C. This is slightly less than the value for pyrex glass reported in Table A.11 (p. 778, Ref. 5.16) of 1.4 W/m·K. The lower value is used in this analysis (see assumption 4.3.33).

Table 4.1-10, Material Properties of Borosilicate Glass (Ref. 5.8 & 5.16)

	Conductivity	Density	Specific Heat	Emissivity
Borosilicate Glass	1.1 W/m·K	2225.0 kg/m ³	835.0 J/kg·K	0.81

4.2 Criteria

The design of the engineered barrier (EB) segment will depend on thermal analysis of the repository host rock and near-field. Criteria that relate to the thermal analysis of the EB segment are derived from the applicable requirements and planning documents. Upper-level systems requirements are provided in the Mined Geologic Disposal System Requirements Document (MGDS-RD) (Ref. 5.6). The requirements flow down to the Engineered Barrier Design Requirements Document (EB-DRD, Ref. 5.5) as specific requirements for engineered barrier segment design. The Waste Package Implementation Plan (WPIP) (Ref. 5.10) also provides criteria and goals for the thermal design of the EBS. The criteria applicable to thermal analysis of waste package emplacement are equivalent to the applicable requirements, interface requirements, and criteria cited in the MGDS-RD, EB-DRD, WPIP and all requirements which apply to thermal analysis are listed in this section for completeness.

4.2.1 MGDS-RD Requirements for Thermal Design

The criteria applicable to thermal analysis of waste package emplacement which appear in the MGDS-RD (pp. 29, 44, 107; Ref. 5.6) and not in the EB-DRD are listed here:

"3.1.5 Major Considerations and Assumptions

...

- M. It is assumed that loaded MPCs emplaced for disposal will have a maximum thermal output of 14.2 kilowatts. Accommodation of this condition will require management of the waste delivery schedule or storage of loaded MPCs with a higher thermal output until the thermal

output has decreased to 14.2 kilowatts. This 14.2 kilowatts is equivalent to the thermal output of 21 PWR assemblies with 40 GWd/MTU burnup and 3.75% initial enrichment 10 years after discharge from a reactor. (Twenty-one assemblies represents the capacity of one of several potential MPC configurations.)"

"3.2.3.2.3 MGDS-Transportation Interface Requirements

...

- J. The MGDS shall provide an emplacement environment (e.g., waste package design, underground facility design, emplacement mode or orientation, spacing between waste packages, etc.) for the MPC with disposal container, such that an emplaced waste package with thermal output of 14.2 kW will not result in an MPC surface temperature higher than 225°C <TBR> [Ref 2.4.2.C][RW-0199][10 CFR 60.135(a)(2)][Derived by 3.2.1.1.H]

The MPC Design is responsible for maintaining the peak SNF cladding temperature below the maximum temperature designated for disposal. To meet this requirement, the peak cladding temperature in a loaded MPC with a thermal output of 14.2 kW may not exceed 350 C when subjected to an MPC external wall temperature of 225°C."

"3.7.3.3 Waste Package Requirements

...

- B.2. Waste packages shall be emplaced in an environment (e.g., waste package design, underground facility design, emplacement mode or orientation, spacing between waste packages, etc.), such that SNF cladding temperatures in an emplaced waste package do not exceed 350°C <TBR>. [10 CFR 60.135(a)(2)][Derived by CRD 3.2.1.1.H]"

4.2.2 EB-DRD Requirements for Thermal Design

The criteria applicable to thermal analysis of waste package emplacement are equivalent to the applicable requirements in the EB-DRD (pp. 3-10, 3-14, 3-21, 3-23, 3-25, 3-26, 3-47, 3-49, 3-50, and 3-54; Ref. 5.5) and are listed here:

"3.1.5 MAJOR CONSIDERATIONS AND ASSUMPTIONS

...

- B. The assumption used in developing this EB-DRD is that the extent of blending (i.e., the mixing in waste packages of SNF and/or HLW of different thermal outputs) required is limited to that which can be accommodated by the WA process.

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Thermal loading studies will determine the extent of blending that must occur. Limited blending can be accomplished at the MRS through the WA process. If significant blending is required, this could have a major impact on the MRS and/or MGDS design and operations, and will be the subject of system studies. If these studies show that changes in system design requirements are necessary, the RDs will be revised."

"3.2.2 RADIOLOGICAL PROTECTION

3.2.2.1 GENERAL REQUIREMENTS

- ...
- C. The Engineered Barrier Segment, together with the Repository Segment, shall provide adequate shielding from radioactive components and high ambient temperatures. [Derived]"

"3.2.3.3 ENGINEERED BARRIER SEGMENT - REPOSITORY SEGMENT INTERFACE REQUIREMENTS

- ...
- A.8. The Repository Segment will accommodate the emplacement concept (TBD) selected during ACD. [Derived]
- ...
- b. The Repository Segment design will prevent free-liquid-phase water from contacting the waste package during the period from package insertion until repository closure. [Derived]
- c. The Repository Segment layout will be designed so that a combination of characteristics will assist in keeping liquid water from contacting the waste packages for the first 300 to 1000 (TBV) years after closure. [Derived]
- d. The Repository Segment layout will also ensure that the design limit temperatures (TBD) for waste forms are not exceeded. [Derived]
- ...
- A.10 If the design requires the waste form to be transferred for any purpose (such as from shipping casks to waste packages), the Repository Segment is responsible for the following:
- ...
- b. Repository Segment options at the surface handling facility will be designed so that cladding failure from mechanical abrasion or deformation considering thermally-induced effects will result in less than five percent (TBV) cladding strain. [Derived]

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- ...
- A.17 The underground facility will be designed so that the performance objectives will be met taking into account the predicted thermal and thermo-mechanical response of the host rock, and surrounding strata, and ground water system. [MGDS-RD 3.7.3.4.C][10 CFR 60.133(i)]"

"3.2.3.4 ENGINEERED BARRIER SEGMENT - WASTE ACCEPTANCE INTERFACE REQUIREMENTS

- ...
- A. WA will provide standard HLW meeting the following criteria:

- ...
- 1.e. Total heat generation rate: Up to 1500 watts per canister (TBV) at the year of shipment.
- 1.f. Waste temperature: Will not have exceeded 400°C (TBV) during transit to ensure the glass transition temperature was not exceeded. [MGDS-RD 3.2.3.2.2.B.1]

- ...
- C. WA will provide standard SNF meeting the following criteria:

- ...
- 1.b. Cross-section: 6 inches x 6 inches or less for BWR and 9 inches x 9 inches or less for PWR (TBV). [MGDS-RD 3.2.3.2.2.A.1][10 CFR 961.11, App. E, B.1]
- ...
- 1.d. Cooling: The minimum cooling time for fuel is five (5) years. [MGDS-RD 3.2.3.2.2.A.1][10 CFR 961.11, App. E, B.3]
- ...
- 1.f. Consolidated Fuel Rods: Fuel which has been disassembled and stored with the fuel rods in a consolidated manner shall be classified as Nonstandard Fuel Class NS-5. [MGDS-RD 3.2.3.2.2.A.1][10 CFR 961.11, App E., B.5]
- ...
2. Temperature will not have exceeded 350°C (TBV) during storage under inert gas. [Derived]"

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"3.7 ENGINEERED BARRIER SEGMENT MAJOR COMPONENT CHARACTERISTICS/REQUIREMENTS

The major components of the Engineered Barrier Segment are the waste packages, the underground facility, any backfill placed in the emplacement drifts, and any emplacement hardware provided to support and protect the emplaced waste package. (The underground facility portion of the Engineered Barrier Segment and the associated requirements allocated to the EB-DRD by the MGDS-RD are identified as interfaces with the Repository Segment in Section 3.2.3.3.) These major components shall be capable of contributing to the assigned function, Isolate Waste (1.4.3), by containing waste in the waste package during the containment period of 300 to 1,000 years (TBR), and then by limiting the release of radionuclides during the post-containment period.

[MGDS-RD 3.7.3.1.A, B] [CRD 3.7.4.1.1]

...

G. To limit the predicted thermal and thermo-mechanical response of the host rock and surrounding strata, and groundwater system, the Engineered Barrier Segment configuration and loading shall:

1. Limit borehole wall temperature (if a borehole is used) to 275°C (TBV)
2. Limit the maximum temperature 1 meter into the rock to 200°C (TBV)
3. Limit the TS_{w3} (vitrophyre tuff) maximum temperature to 115°C (TBV)
4. Limit the maximum ground surface temperature change in the vicinity of the repository to 6°C (TBV)
5. Limit the emplacement drift maximum temperature to 100°C (TBV)
6. Limit the access drift maximum temperature to 50°C (TBV)

[MGDS-RD 3.7.3.4.C] [10 CFR 60.133(i)]"

"3.7.1 WASTE PACKAGE SUBSYSTEM REQUIREMENTS

...

B. The design of waste packages shall include, but not 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.

[MGDS-RD 3.7.3.3.B] [10 CFR 60.135(a)(2)]"

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"3.7.1.3 INTERNAL STRUCTURE REQUIREMENTS

...

- G. The internal structure shall maintain functionality under the thermal and chemical conditions generated by the waste form.

[Derived]"

"3.7.2 BACKFILL REQUIREMENTS

...

- C. The transfer of heat from the waste package to the geologic setting by the backfill material shall not have an adverse effect on the long term performance of the WP.

[Derived]

...

- F. The chemical and mechanical stability of the backfill when subjected to the maximum thermal environment anticipated in the repository shall not have an adverse effect on the long term performance of the waste package.

[Derived]"

4.2.3 WPIP Criterion for Thermal Design

The impetus to perform thermal evaluations of the waste package and near-field is provided by the Waste Package Implementation Plan (WPIP, Ref. 5.10). Design goals and the activities supporting these goals are listed in the WPIP. The source of the design goals is, for the most part, the Engineered Barrier Design Requirements Document and for the remainder the design goals were selected based upon engineering judgement. Design goals related to thermal analysis are listed in Section 2.4 of the WPIP (p. 2-4; Ref. 5.10) and provide basic thermal criteria for the design of the EBS:

"2.4 DESIGN GOALS

...

- Center line fuel pin temperature limit of (to be determined (TBD)) °C
- Rock wall temperature limit of (TBD) °C
- Thermal loading of the repository (TBD)

...

The maximum temperature of the glass waste forms must be maintained below limits established for them. This limit is about 500°C (to be verified) for West Valley Defense High-Level Waste glass. The YMP and the glass producers have the responsibility to maintain the peak temperature below the transition temperature.

...

- Meet temperature limits for components
- Provide for a range of thermal loads
- Provide capability to adjust repository thermal loading after emplacement"

Activities to support the design goals related to thermal analysis are indicated in Sections 3.4, 4.5, and 5.1 of the WPIP (pp. 3-2, 4-31, and 5-1; Ref. 5.10):

"3.4 PERFORMANCE ALLOCATION

... Thermal analyses will be performed to determine the temperature profiles across the drifts for drift emplacement. Limited thermal analyses will also be performed for the borehole emplacement modes, assuming various package sizes and thermal loadings. These analyses will permit the re-evaluation of the goals given in the SCP for performance measures. ..."

"4.5 ENVIRONMENTAL INFORMATION NEEDS

...

4.5.2 Hydrologic Properties

Determine hydrologic (and thermal) properties of the WP environment in order to:

- Develop comprehensive model of the thermal and hydrologic behavior of the waste package environment as a function of overall repository thermal loading and rock properties, including two phase fluid flow.
- Use the model to forecast the near field temperature and fluid flow; these near field parameters will be used by the M&O Waste Package Development, M&O PA, and LLNL to calculate/forecast the WP temperatures (surface and centerline) and the distribution of corrosion rates and package lifetimes (as input to the models determined by the chemical and mineralogical properties investigation described above)."

"5.1 WP/EBS DESIGN ACTIVITIES

...

2. Thermal Evaluation (time dependent)

2.1. Internal

2.1.1. SNF and HLW

2.1.2. WP basket

2.1.3. WP internal barrier(s)

2.1.4. WP body

2.1.5. Closure

2.2. External, EBS and near field

2.3. Receipt rate and thermal variability"

4.2.4 Thermal Goals for EBS Design

Based on assumption 4.3.1, the requirements of the EB-DRD (Ref. 5.5), and the design goals of the WPIP (Ref. 5.10), the following thermal criteria are established for the design of the EB segment:

- Keep the rock mass temperature at 1 meter from a vertical borehole less than 200°C.
- Keep the emplacement drift wall temperature less than 200°C.
- Limit the TSw3 (basal vitrophyre) maximum temperature to less than 115°C.
- Limit the maximum ground surface temperature change in the vicinity of the repository to less than 2°C.
- Limit the emplacement drift maximum temperature for borehole emplacement to less than 100°C.
- Limit the access drift wall rock maximum temperature to less than 50°C during preclosure.
- Limit the CHn maximum temperature to less than 115°C.
- Limit the PTn (Upper Paint Brush non-welded) maximum temperature to less than 115°C.
- Limit the SNF cladding maximum temperature to less than 350°C.
- Limit the high-level waste glass maximum temperature to less than 500°C.
- The structural strength of any material component of the waste package shall not be compromised by temperature/environment of the EBS environment.
- Maximize the time the waste package container stays above boiling consistent with the thermal strategy developed.

The above thermal criteria are in addition to those previously quoted from the EB-DRD (Ref. 5.5).

4.2.5 Thermal Goals/Criterion Addressed by this Analysis

Based on Assumption 4.3.1, the requirements listed in the previous sections, and the design goals of the WPIP (Ref. 5.10), the following thermal criteria are to be addressed by this analysis:

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- Limit the high-level waste glass maximum temperature to less than 500°C.
- The structural strength of any material component of the Waste Package shall not be compromised by temperature/environment of the EB segment environment.

4.3 Assumptions

All assumptions identified in this section will require verification (or superseding assumptions) as the waste package design proceeds and should be treated as TBV items for preliminary design. For Pre-title II design (conceptual or preliminary) and documents not subject to the 3-series QAPs, assumptions are identified and documented, but they are not subject to tracking in accordance with MGDS NLP-3-15.

4.3.1 The following thermal criteria are assumed to apply to the design of the Engineered Barrier Segment. These criteria are consistent with current program decisions in the Controlled Design Assumption Document (CDA, Ref. 5.7). The criteria are originally based on a reevaluation of the Site Characterization Plan (SCP) thermal goals (Table 3, p. 22, Ref. 5.30). Each thermal criterion is listed here followed by its CDA or SCP reference. This assumption is used in Section 4.2. As specified in Section 4.2.5, only the 350°C SNF cladding temperature and the material structural strength criteria are used directly for this analysis. These two criteria are used throughout Section 7. However, the other listed items are used in reference 5.13 and were used to generate the waste package surface boundary condition used for this analysis. They are listed here in the interests of consistency.

- Keep the rock mass temperature at 1 meter from a vertical borehole less than 200°C. (CDA EBD RD 3.7.G.2, p. 6-76, Ref. 5.7)
- Keep the emplacement drift wall temperature less than 200°C. (CDA EBD RD 3.7.G.2, p. 6-76, Ref. 5.7)
- Limit the TSw3 (basal vitrophyre) maximum temperature to less than 115°C. (CDA EBD RD 3.7.G.3, p. 6-77, Ref. 5.7)
- Limit the maximum ground surface temperature change in the vicinity of the repository to less than 2°C. (CDA EBD RD 3.7.G.4, p. 6-78, Ref. 5.7)
- Limit the emplacement drift maximum temperature for borehole emplacement to less than 100°C. (CDA EBD RD 3.7.G.5, p. 6-79, Ref. 5.7)
- Limit the access drift wall rock maximum temperature to less than 50°C during

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preclosure. (CDA EBD RD 3.7.G.6, p. 6-80, Ref. 5.7)

- Limit the CHn maximum temperature to less than 115°C. (CDA DCSS 025, p. 6-155, Ref. 5.7)
- Limit the PTn (Upper Paint Brush non-welded) maximum temperature to less than 115°C. (CDA DCSS 031, p. 6-160, Ref. 5.7)
- Limit the SNF cladding maximum temperature to less than 350°C. (CDA DCWP 001, p. 6-165, Ref. 5.7)
- Limit the high-level waste glass maximum temperature to less than 500°C. (CDA DCWP 002, p. 6-166, Ref. 5.7)
- The structural strength of any material component of the waste package shall not be compromised by temperature/environment of the EBS environment. (EBDRD 3.7.1.3.G and p. 2-4, Ref. 5.10)
- Maximize the time the waste package container stays above boiling consistent with the thermal strategy developed. (Table 3, p. 23, Ref. 5.30)

4.3.2 Two primary high thermal loadings (100 MTU/acre and 83 MTU/acre) and a couple variations of a low thermal loading (25 MTU/acre) will be considered in this analysis. These values are consistent with the range of thermal loadings (20 - 100 MTU/acre) given in the CDA (Key 019, p. 6-24, Ref. 5.7). Also, in an effort to have all of the M&O analysts on the same "sheet of music", thermal loadings of 25 and 83 MTU/acre were recommended in a Systems Engineering interoffice correspondence (p. 2, Ref. 5.23). A thermal loading of 100 MTU/acre represents the likely maximum possible without violating thermal goals according to the FY 93 Thermal Loading System Study (p. 10-2, Ref. 5.24) and is a bounding case for this analysis. This assumption is used in Section 7.1.

4.3.3 The waste package will be emplaced in-drift in a horizontal mode. This is consistent with large waste packages such as the MPC with disposal container and is a current program decision (CDA Key 011, p. 6-18, Ref. 5.7). This assumption is used throughout Section 7.

4.3.4 It is assumed that the data in reference 5.21 is a reasonable representation of the thermal design basis Pu disposition greenfield glass waste form. Reference 5.21 states that the Pu disposition waste form would contain approximately 1 kg (87,000 Ci) of Cs, that the total weight of the glass in a pour canister is 1680 kg, of which 5 wt% is Pu. The composition of the Pu is: Pu-238, 0.05 wt%, Pu-239, 93.3 wt%, Pu-240, 5.9 wt%, Pu-241, 0.35 wt%, and Am-241, 0.4 wt%. To complete the characterization of the Pu disposition

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pour canister, it is assumed that a Savannah River pour canister as described in references 5.12 and 5.33 is used to contain the glass. This data is required in order to determine the decay heat curve of the glass waste form and to properly model the waste package geometry. This assumption is used throughout Sections 6 and 7.

- 4.3.5 The decay heat curve for the Pu disposition glass waste form thermal design basis is calculated with the use of the software MATHCAD. The data from reference 5.21 (assumption 4.3.4) is assumed to accurately represent the Pu disposition glass waste form which may be received by the MGDS. Use of the data from reference 5.21 in this manner is consistent with the reasons for its creation. This assumption is used throughout Section 7. The data, however, is not presented in ANSYS format and does not define time steps which is useful for the analysis. Thus, the MATHCAD software was used to create the decay heat versus time curve of the data and to create a MATHCAD print file with the required ANSYS decay heat curve data. This MATHCAD print file was then translated by hand into an ANSYS readable file to be used by the analysis. It is further assumed that the curve representation of the data is a reasonable representation of the data presented in reference 5.21 and that the use of curve representation does not affect the results presented in this analysis. The basis for this assumption is engineering judgement. This assumption is used throughout Section 7. The MATHCAD calculation file is presented in Attachments I and IV for two different assumptions concerning the decay energy of Cs-137 and restates the data used from reference 5.21 as input. The MATHCAD print file containing the ANSYS data is presented in Attachments II and V. The ANSYS readable file used in this analysis is presented in Attachments III and VI. The decay heat curves are presented in Sections 6.0 and 7.4.
- 4.3.6 It is assumed for this analysis that all of the Cs is Cs-137 with a half life of 30 years. This assumption is conservative since it increases the number of heat generating atoms of Cs-137. This assumption is used throughout Section 7.
- 4.3.7 It is assumed for this analysis that all of the decay energy from Cs and Pu is captured in the glass matrix. This includes all gamma radiation, neutrons, alpha particles, etc. However, this assumption is slightly relaxed with the heat curve generated in Appendix IV by assuming that the neutrinos escape the waste package. This assumption is conservative since shielding calculations (reference 5.21) show that the gamma dose rate a 1 meter from the pour canister is 1000 R/hr. Thus, a significant amount of gamma radiation does escape from the pour canister which will significantly reduce the heat generated internal to the glass matrix. Therefore, use of this assumption for this analysis will significantly over predict the glass temperatures. This assumption is used throughout Section 7.
- 4.3.8 It is assumed for this analysis that all of the Pu disposition waste form is emplaced in the repository with an insignificant aging time (i.e., the glass pour canisters are emplaced in

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the repository immediately after manufacture.) This assumption is conservative since it does not allow the Cs to significantly decay before emplacement which increases the amount of heat generated in the glass matrix. Therefore, use of this assumption for this analysis will greatly over predict the glass temperatures. This assumption is used throughout Section 7.

- 4.3.9 It is assumed for this analysis that the waste package is adequately modeled with a three dimensional finite element model which models the repository emplacement drift wall as a shell. The model does not require the modeling of the repository far field since this was performed in reference 5.13. This assumes that the Pu disposition waste package (i.e., the DHLW waste package) will have a negligible impact upon thermal loading of the repository and a negligible impact upon the drift wall temperatures (see assumptions 4.3.11 and 4.3.12). The basis of this assumption is engineering judgement. This assumption is used through out Section 7.
- 4.3.10 It is assumed for this analysis that an axial power peaking factor of 1.00 is reasonable and sufficient to obtain the peak glass matrix temperatures. Use of this factor assumes that the glass manufacturing process is controlled such that a reasonably homogeneous glass matrix is obtained such that any axial variations are negligible. This assumption is based upon engineering judgement. This assumption is used throughout Section 7.
- 4.3.11 It is assumed for this analysis that the Pu disposition glass waste form waste packages will be emplaced at the midpoint between two SNF waste packages in the repository drifts. This provides the highest drift wall temperatures that can be applied to the DHLW WP since the DHLW WP has an initial average heat generation rate much less than a SNF WP. Thus, given a repository areal loading limit such as 100 MTU/acre, the SNF will control the repository rock temperatures. Also, if the DHLW WPs were to be emplaced in a section of the repository isolated from the SNF WPs, a similar repository areal loading limit would be applied to the DHLW section of the repository. The entire repository is limited by the same rock temperature goals as specified for the SNF WP and these temperature goals apply to any other WP emplacements. Since the DHLW WP has a smaller long-term heat generation rate and the initial repository heat loading will be no greater than that for SNF WPs, the repository rock wall for the DHLW section of a repository will be slightly cooler over time than the section of the repository containing the SNF WPs. The cooler drift walls would dictate cooler DHLW WP surface and glass center line temperatures. Thus, the analysis performed by placing the DHLW WP between SNF WPs should be representative of the highest expected temperatures the DHLW WP could experience. This assumption is used throughout Section 7.
- 4.3.12 The average drift wall surface temperature (time dependent) at the midpoint between two SNF waste packages, as defined in reference 5.13 for each thermal load case, will be applied as the uniform boundary condition for the finite element shell representing the

drift wall for the detailed DHLW waste package analysis (normal conditions). The detailed waste package model will examine the design basis waste form heat generation rate rather than the average waste form heat generation rate which will result in slightly higher near field temperatures. This effect, however, will be assumed to have a small impact upon the calculated glass matrix temperatures and will be neglected. The basis for this assumption is engineering judgement. This assumption is used throughout Section 7.

- 4.3.13 The effects of drift backfilling will not be considered for the repository base case analysis. Backfill material has not been defined to date and will not be considered to be within the scope of this analysis. Backfill effects on the waste package design will be addressed in a different analysis. This assumption is used throughout Section 7.
- 4.3.14 The Savannah River pour canister is assumed to be adequately represented as presented in reference 5.33 and is assumed to be the representative design which specifies the geometry and materials of construction. The basis of this assumption is that the specified reference is the best information available concerning the pour canister design. This assumption is used throughout Section 7.
- 4.3.15 The waste package disposal container material composition, geometry, and dimensions are assumed to be those specified in reference 5.28. This data is also presented as Waste Package Development sketches which are identified as specified in references 5.31 and 5.33, and are based upon reference 5.28. This assumption is used throughout Section 7.
- 4.3.16 The DHLW/Pu disposition waste package is assumed to be evacuated and backfilled with helium gas. The basis for this assumption is that this process is considered on pages II.A.3-20, II.A.3-53, and II.A.4-2 of reference 5.8 as a method to meet the internal humidity requirement for the waste package internals. However, He conduction is not modeled for this analysis. All He filled spaces are assumed to be voids with no conduction modeled. The use of this assumption means that the resistance to heat removal increases because the heat is forced to be conducted around these gaps or is required to be radiated through the gaps. This will have the effect of over predicting the internal glass temperatures. Therefore, this assumption is conservative with respect to predicting glass matrix temperatures. This assumption is based upon engineering judgement. This assumption is used throughout Section 7.
- 4.3.17 Modeling each pour canister as "floating" in the DHLW waste package such that each pour canister neither touches the disposal container or another pour canister is assumed to provide conservative results for this analysis. Further, the minimum distance between each pour canister and the center line of the disposal container is assumed to be the same as the minimum distance between each pour canister and the inside surface of the disposal container. All gap sizes are documented in the ANSYS input decks. Finally, the gap

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between the pour canisters and the disposal container is assumed to be modeled conservatively if it is modeled as being void of material (i.e., a vacuum). The basis for this assumption is as follows: this space will most likely be evacuated and backfilled with helium gas for similar reasons as specified in assumption 4.3.16 for the DHLW waste package internals. However, since helium has a reasonably good thermal conductivity, assuming a vacuum will result in slightly higher internal temperatures due to the fact that all heat transfer from the pour canisters must be radiated to the inner surface of the disposal container. This is conservative for this analysis. This assumption is equivalent to assuming only radiative heat transfer between the MPC shell and the disposal container. This assumption is used throughout Section 7.

- 4.3.18 Modeling only conduction and radiative heat transfer is assumed to provide conservative results for this analysis. The basis for this assumption is as follows: convective heat transfer will occur with the fill gas which is placed internal to the waste package, however, the natural convective heat transfer will have a small or negligible contribution to the total heat transfer (see reference 5.16 for a discussion on natural convection heat transfer). Thus, the problem may be modeled with only the dominant heat transfer modes with a negligible or conservative impact upon the results. This assumption is used throughout Section 7.
- 4.3.19 It is assumed for this analysis that the transient mode of calculation is not required and that a steady state solution at each time specific boundary condition and heat generation rate results in a negligible difference in the results. This assumption is based upon the fact that the heat generation rate declines such that the temperature drops from the waste package center line to the drift wall quickly (relative to 1000 years) becomes small and that the rate of change is such that the inertial effects are negligible. This assumption is also required in order to obtain a solution in a reasonable length of time. A true transient calculation would require in excess of 2 weeks of cpu time due to the combination of 1) inclusion of large radiation heat transfer surfaces with large conduction volumes and 2) small temperature differences over a large portion of the time frame which make converges testing very unstable. This assumption is based upon engineering judgement and is used through out Section 7.
- 4.3.20 It is assumed for this analysis that the waste package with disposal container will not have filler material placed in side of it. The basis for this assumption is that the consideration of filler material is beyond the scope of this analysis. Evaluation of effect of filler materials will be evaluated with additional analysis at a later time. This assumption is used throughout Section 7.
- 4.3.21 It is assumed for this analysis that the waste package with disposal container will not be individually fitted with radiation shielding. This is consistent with the CDA; KEY 031, page 6-32, of reference 5.7. This assumption is used throughout Section 7.

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- 4.3.22 It is assumed for this analysis that the pour canister is filled to 85% of its volume with glass matrix and that the remaining space in the pour canister is conservatively modeled as a void (i.e., vacuum) with no radiation. Reference 5.12, p. 3.3-12, and reference 5.14, p. 2.2.1.3-4, provide the percentage of the pour canister volume which is filled, reference 5.21 provides the density of the glass (2.6 g/cm^3), and reference 5.33 provides the pour canister dimensions. This provides a glass fill height of 2.36 m. To conservatively predict the glass temperatures the same amount of heat generation is assumed to occur with a pour height approximately 8.7% less (i.e., 2.1549 m) to account for manufacturing tolerances. This assumption is based upon engineering judgement and the fact that very conservative glass temperatures will be predicted by using this assumption. First, heat will be modeled as being generated in a smaller volume which in general (see reference 5.16) will result in higher internal temperatures. Second, by modeling the remaining space as a vacuum which does not have radiation heat transfer between the glass surface and the upper end of the pour canister, the heat must be conducted through the glass to the pour canister in the radial direction. This effectively removes a heat transmission path, however effective it maybe, and in general will result in higher internal temperatures. Also, this significantly decreases the computer run time and negligibly impacts the results. This assumption is used throughout Section 7.
- 4.3.23 It is assumed for this analysis that waste package materials which are in contact, that a perfect weld will be modeled. This means that a contact thermal resistance will not be modeled between touching materials. This assumption is intended to make the modeling of the problem simpler and is judged to have a negligible impact upon the results of this analysis and any non-conservative impact will be more than offset by the conservatism in the other assumptions used for this analysis. The basis for this assumption is engineering judgement. This assumption is used throughout Section 7.
- 4.3.24 Modeling the waste package as "floating" in the emplacement drift such that the waste package does not touch the emplacement drift at any point is assumed to provide conservative results for this analysis. In addition, the emplacement drift is assumed to not be filled with any material (i.e., a vacuum is assumed) such that the only heat transfer path is that of radiative heat transfer. The basis for this assumption is engineering judgement. The assumption is conservative with respect to the waste package internal temperatures since the modeled geometry eliminates any conduction or convective heat transfer and will limit the mode of heat transfer to only radiation between the outer surface of the waste package and the drift surfaces. This assumption is used throughout Section 7.
- 4.3.25 The vertical placement of the waste package centerline above the invert in the emplacement drift is determined as described in reference 5.13. The offset value OFFST in the ANSYS input deck was adjusted for the difference in waste package diameter and used accordingly. The use of this assumption is consistent with the vertical WP

placement in reference 5.13 and maintains consistency with the analysis which provides the boundary conditions for this analysis. This assumption is used throughout Section 7.

- 4.3.26 The all emplacement drift parameters such as drift diameter, drift length, invert composition, invert dimensions, material properties, etc. are obtained from the analysis presented in reference 5.13. This is assumed adequate and reasonable for this analysis in order to remain consistent with the geometry which provides this analysis with the required boundary conditions. The basis of this assumption is engineering judgement and is used throughout Section 7.
- 4.3.27 The properties of helium at atmospheric pressure (Table 4.1-5) are assumed to be representative of the conditions which helium in the waste package will experience. This assumption is based upon the fact that a one atmosphere fill pressure is representative of industry standard for storage casks. Page 10 of reference 5.32 provides the highest pressure which storage casks are filled as approximately 1.5 atmosphere; also most industry vendors use substantially less pressure in their designs. Use of one atmosphere is representative of the most likely to be used. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.28 Use of the material properties for Stainless Steel 316 provided in Tables 4.1-1 and 4.1-2 is assumed to adequately represent any stainless steel used in the waste package for this analysis. Particularly the use of a constant value for the density and emissivity is assumed to be adequate for this analysis. The basis for this assumption is engineering judgement and the fact that the temperature dependent values of thermal conductivity and specific heat are specified well enough to cover the anticipated temperatures the waste package is expected to experience. Also, the values for density and emissivity change only slightly over the expected range of temperatures. Thus, using a single value will not affect the results of the analysis. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.29 Use of the material properties for Alloy 825 provided in Tables 4.1-3 and 4.1-4 is assumed to adequately represent Alloy 825 for this analysis. Particularly the use of a constant value for the density and emissivity is assumed to be adequate for this analysis. The basis for this assumption is engineering judgement and the fact that the temperature dependent values of thermal conductivity and specific heat are specified well enough to cover the anticipated temperatures the waste package is expected to experience. Also, the values for density and emissivity change only slightly over the expected range of temperatures. Thus, using a single value will not affect the results of the analysis. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.30 Use of the material properties for C71500 70/30 Copper-Nickel Alloy provided in Table 4.1-6 and the emissivity of oxidized nickel as presented in Section 4.1 is assumed to

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adequately represent C71500 70/30 Copper-Nickel Alloy for this analysis. Particularly the use of a constant value for the density and specific heat is assumed to be adequate for this analysis. The basis for this assumption is engineering judgement and the fact that the temperature dependent values for thermal conductivity are specified well enough to cover the anticipated temperatures the waste package is expected to experience. Also, the value for density changes only slightly over the expected range of temperatures. Thus, using a single value will not affect the results of the analysis. ANSYS does not extrapolate beyond the given tabulated values, rather it uses the last value available in the table. Thus, since specific heat generally increases with increasing temperature, ANSYS will use a conservative value for specific heat by using the C71500 70/30 Copper-Nickel Alloy specific heat at 20°C. This assumption is used in Section 4.1 and throughout Section 7.

- 4.3.31 Use of the material properties for TSw2 provided in Tables 4.1-7 and 4.1-8 is assumed to adequately represent TSw2 rock for this analysis and is consistent with the use of these material properties as presented in reference 5.13. The same assumptions and basis for assumptions presented in reference 5.13 concerning these material properties apply to this analysis. Since this analysis is dependent upon reference 5.13 and they should be considered a coupled pair of analysis and the reader should be familiar with both, the set of assumptions is not repeated here. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.32 Use of the material properties for concrete provided in Table 4.1-9 is assumed to adequately represent concrete for this analysis and is consistent with the use of these material properties as presented in reference 5.13. The same assumptions and basis for assumptions presented in reference 5.13 concerning these material properties apply to this analysis. Since this analysis is dependent upon reference 5.13 and they should be considered a coupled pair of analysis and the reader should be familiar with both, the set of assumptions is not repeated here. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.33 Use of the material properties for borosilicate glass provided in Table 4.1-10 is assumed to adequately represent borosilicate glass for this analysis. The use of Pyrex glass is assumed reasonable since pyrex contains boron and the composition of the glass is reasonably close to the composition of borosilicate glass provided in reference 5.21. This assumption is used in Section 4.1 and throughout Section 7.
- 4.3.34 The analysis for the 100 MTU/acre repository thermal loading is assumed to bound all thermal loadings which are less than 100 MTU/acre. Further, it is assumed that performing only the 100 MTU/acre case is sufficient to show that the Pu disposition greenfield glass DHLW WP will have similar performance parameters as the MGDS DHLW WP. This assumption is based upon the analysis performed in reference 5.34

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which show that the 100 MTU/acre thermal loading produce the highest glass matrix temperatures inside the DHLW waste package and engineering judgement. Therefore, only the 100 MTU/acre ANSYS cases are repeated for the Pu disposition greenfield glass DHLW WP analysis. This assumption is used throughout Section 7.

- 4.3.35 It is assumed for this analysis that the top and bottom of the pour canister geometry can be modeled as flat solid plates with a 2.0 cm thickness for the top and 1.5 cm thickness for the bottom of the pour canister with negligible affect on the calculated results. Detailed modeling of the pour canister features will significantly increase the modeling and computation time required for the analysis with little effect on the results. Thus, these geometric features have been modeled to make the pour canister a right circular cylinder. Modeling the top of the pour canister as a flat plate reduce its heat transfer efficiency by removing the "fin" effect. The heat transfer surface area of the modeled flat plate is smaller than that of the actual geometry. This reduces any radiative and convective heat transfer efficiency and will cause the model to predict higher temperatures. Modeling the concave shaped bottom of the pour canister as a flat plate will not significantly affect the analysis of the model since the shape is mildly concave and is similar to a flat plate. The basis of this assumption is engineering judgement and this assumption is used throughout Section 7.
- 4.3.36 It is assumed for this analysis that not modeling the SNF WP at each end of the emplacement drift will not significantly affect the results of the analysis. Previous analysis (references 5.13 and 5.27) have shown that the major heat transfer direction is radially out from the waste package and the radiative heat transfer view factors to the SNF waste package is small relative to that of the drift wall surface. In addition, the model is set up such that all radiative heat transfer goes to the drift wall and none escapes down the drift opening. Given this information, engineering judgement is basis for assuming that not modeling the ends of the SNF WP at the edge of the drift model will not significantly impact the calculated results and is used to simplify the model. This assumption is used throughout Section 7.

4.4 Codes and Standards

Not Applicable. Thermal design of the waste package is not controlled by codes and standards. The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Ref. 5.15) has been used only as a source of material properties.

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- 5.17 Marks' Standard Handbook for Mechanical Engineers, 9th Edition, E. A. Avallone, T. Baumeister, McGraw-Hill Book Co., 1987.
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6. Use of Computer Software

The FEA analysis computer code used for this analysis is ANSYS V5.0A which is identified with the Computer System Configuration Identifier (CSCI) B00000000-1717-1200-30003. ANSYS is a commercially available finite element thermal and mechanical analysis code and is appropriate for the thermal analysis of waste packages, waste package emplacements, and waste package environments. 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 ANSYS V5.0A Verification and Validation Final Report (page 1, Ref. 5.25). The ANSYS evaluations performed for this design are fully within the range of the validation performed for the ANSYS V5.0A code. Access to and use of the code for the analysis granted and performed in accordance with the ANSYS V5.0A Life Cycle Plan (page 1, Ref. 5.26) and the QAP-SI series procedures. Inputs and outputs to the ANSYS software are included as attachments as described in the following

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design analysis.

The ANSYS SNF heat load file was generated with the computer code MATHCAD V5.0+ and is classified as computational support software. MATHCAD V5.0+ is not a controlled computer code and has not been qualified under the QAP-SI series of M&O procedures and will not be qualified under the M&O procedures. MATHCAD V5.0+ simply provides a frame work to automate simple mathematical calculations which can easily be checked by hand or through alternate calculational methods. Based upon the data provided in assumptions 4.3.4 and 4.3.5, MATHCAD V5.0+ generates a simple curve via direct equation calculation. Once the proper equation coefficients for the equations are determined, MATHCAD V5.0+ summarizes the numeric values at selected times and writes an ASCII print file with the heat curve data versus ANSYS time steps. The ASCII print file was then translated by hand to an ANSYS readable file format. The MATHCAD V5.0+ calculation file, MATHCAD V5.0+ print file, and ANSYS data file are provided as Attachments I, II, and III for the assumption of 100% energy capture in the glass and Attachments IV, V, and VI for the assumption of 100% energy capture minus the beta decay neutrino energy. The data and intermediate files are provided in this analysis for the purpose of performing hand calculation checks. The data manipulation has been checked by hand the originator, and will be used in this analysis on that basis. MATHCAD V5.0+ was utilized for the purpose of computational support software as it was intended and it is appropriate for the use of generating a curve given the equation forms to supply data for an ANSYS SNF heat load file. The MATHCAD V5.0+ software was executed on an IBM PC compatible.

7. Design Analysis

7.1 Background

As part of an engineered barrier system for the containment of radionuclides, the DHLW WP must be shown to comply with all regulations and requirements that govern the conditions of the emplaced SNF and the near-field rock at the repository horizon. Temperatures in the WP and near-field host rock are key to radionuclide containment, as they directly affect oxidation rates of the metal barriers, metal pour canisters and glass matrix structural integrity, and the ability of the rock to impede particle movement.

Maximum allowable temperatures are based on material performance criteria and are specified as design goals for the WP/EBS design. For borosilicate glass, the MGDS program has recommended a 500°C temperature limit for the borosilicate glass matrix waste form as documented in reference 5.7 (CDA DCWP 002, p. 6-166). This limit is slightly under the borosilicate glass softening temperature (ref. 5.8) which is the point at which long term performance starts to significantly degrade. To limit the predicted thermal and thermo-mechanical response of the host rock and surrounding strata, maximum temperatures of 200°C for TSw2 (at the emplacement drift wall) and 115°C in the TSw3 (vitrophyre tuff) layer have

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been specified. Specific characteristics and requirements for the engineered barrier system are listed in the Yucca Mountain Site Characterization Project Engineered Barrier Design Requirements Document (Ref. 5.5).

The method for DHLW WP thermal evaluations involves a two-model approach to determine the time-dependent WP thermal behavior. As presented in reference 5.13, a three-dimensional (3-D) transient finite element model of the WP emplacement provides the drift wall surface temperature history at the midpoint between two SNF WPs for use as a boundary condition. The drift wall boundary condition is then applied to a detailed three dimensional (3-D) DHLW WP model, it is this 3-D model which is analyzed in this report. The reasoning behind the assumption that the DHLW WPs are to be placed between two SNF WPs is provided in assumption 4.3.11 and will not be discussed further here. The model is intended to predict reasonably conservative peak glass matrix temperatures, peak pour canister surface temperatures, and peak disposal container temperatures.

The thermal environment of the WP in the repository will change with time and is affected by the heat produced in the WPs. Therefore, the emplacement scale thermal evaluation, as performed in reference 5.13, must be a transient analysis that takes into account the time varying heat load of the WP. The transient analysis for the emplacement scale evaluation can then feed the detailed WP thermal evaluation with boundary conditions for each point in time during the time period being analyzed. This can be contrasted to a SNF storage cask analysis where the thermal environment is assumed constant and is provided by regulations.

To determine the effect of the WP on repository near-field temperatures, a 3-D emplacement model was evaluated for a range of thermal loadings. The analysis is described in detail in the supporting emplacement thermal model design analysis (Ref. 5.13). A parametric set of thermal loading cases, summarized in Table 7.1-1, is required because the thermal loading for the repository has been specified as a range in the Controlled Design Assumptions Document (CDA) (Key 019, p. 6-24, Ref. 5.7) and the DHLW WP must be shown to meet requirements over that range. Representative "high" and "low" thermal loadings of 100 MTU/acre (24.7 kg U/m²), 83 MTU/acre (20.5 kg U/m²), and 25 MTU/acre (6.2 kg U/m²) were selected (see assumption 4.3.2) to be consistent with the CDA and the Thermal Loading Systems Study (Ref. 5.24), and drift spacings in multiples of 22.5 m (see ref. 5.13) were selected to be consistent with the Repository/WP Initial Summary Report (Ref. 5.27). However, for the DHLW Pu disposition greenfield glass analysis, only the 100 MTU/acre (High Thermal Loading #1) will be analyzed (see assumption 4.3.34). The intent of this analysis is to show that the DHLW Pu disposition greenfield glass WP has a very similar performance profile to the MGDS DHLW WP which was analyzed in reference 5.34.

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Table 7.1-1. Large Waste Package Thermal Loading Scenarios
(From Table 7.5-1 of Reference 5.13)

AML MTU/acre	Initial APD kW/acre	Waste Package Spacing	Drift Spacing
100 (high #1)	113.7	16.2 m	22.5 m
83 (high #2)	94.4	19.5 m	22.5 m
25 (low #1)	28.4	32.3 m	45.0 m
25 (low #2)	28.4	21.6 m	67.5 m
25 (low #3)	28.4	16.2 m	90.0 m

The low thermal loading drift spacings described in Table 7.1-1 represent the utilization of even multiples of the high thermal loading drift spacing (every other drift, every third, etc.). Low thermal loading #1 achieves the longest reasonable WP spacing and results in the lowest near-field temperatures; low thermal loading #2 has a WP spacing similar to that for the high thermal loading; and low thermal loading #3 has a short WP spacing and represents the "localized disturbance" concept for low loadings. The "localized disturbance" concept depends on high temperature gradients (due to the closely spaced WPs) to drive local water in the rock away from the emplacement drifts. The analysis performed in reference 5.13 was performed to determine the rock wall temperatures for these conditions and whether the rock temperature goals were met. The drift wall surface temperatures from that analysis can be used as a boundary condition to determine the WP internal and glass matrix temperatures.

7.2 Design Basis Heat Load

To capture a majority of the Pu disposition greenfield glass waste form, the WP must be designed and evaluated to accommodate the bounding or limiting case of a glass waste form which has a thermal output much higher than average. Thus, a design basis heat load can be determined which can be considered the hottest glass waste form heat load that could be loaded and emplaced in that waste package. The detailed waste package/EBS evaluation would then represent the hottest waste package for this waste form in the repository at a given thermal loading with average SNF WPs being the majority of the emplaced waste packages. While all of the waste packages (hot and cold) will collectively influence repository temperatures (assumed to be the average SNF WP characteristics), every waste package must meet thermal goals (WP design basis heat load characteristics). The methodology and selection of commercial SNF design basis SNF for WP design is covered in reference 5.35 and the selection of the MGDS DHLW WP design basis heat load is covered in reference 5.34. The design basis Pu disposition

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greenfield glass waste form heat load which will be used to compare to the MGDS DHLW WP design basis heat load is presented in Appendix III and VI and is based upon the data in reference 5.21, assumption 4.3.4, and assumptions 4.3.5 through 4.3.8.

Given that higher capacity waste packages are more likely to exceed thermal goals than smaller ones in the same repository thermal environment, the choice of a design basis heat load is important because it could limit the number of pour canisters that can be loaded without exceeding thermal goals for disposal. The limiting thermal goal for DHLW type waste packages is a temperature of no more than 500°C anywhere in the glass matrix. Several different MGDS DHLW design basis heat load types have been used in by the OCRWM to demonstrate compliance with requirements and to allow comparison with previous evaluations. Table 7.2-1 summarizes the MGDS DHLW heat load types used as specified in reference 5.34.

Table 7.2-1. DHLW Thermal Analysis Design Bases Heat Loads (Ref. 5.34)

Manufacture Location	Hanford Site	Savannah River Site	Idaho National Engineering Laboratory	West Valley Demonstration Project
Time Since Emplacement (Years)	Watts/Pour Canister	Watts/Pour Canister	Watts/Pour Canister	Watts/Pour Canister
0	869	709	339	326
1	683	627	267	319
2	595	586	230	311
5	502	527	185	290
10	439	467	157	258
15	391	418	138	230
20	349	374	123	205
30	279	301	97	164
50	181	198	61	105
100	67	75	20	37
200	19	17	2.6	8.9
300	12	7.2	0.67	5.4
500	8.7	2.7	0.24	3.7
1000	3.9	1.1	0.11	1.9
2000	0.86	0.72	0.06	0.7
5000	0.08	0.54	0.04	0.33
10000	0.06	0.43	0.03	0.26

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The design basis heat load will impact the timing of peak temperatures as well as the magnitude of the peak. The repository host rock temperatures will peak between 10 to 500 years depending on the thermal loading but will be largely independent of the individual waste package design. The waste package itself will experience its peak temperature before the rock temperature peaks. The peak temperature and its timing will depend on the design basis heat load and the waste package design. In previous analyses of the large waste package (p. 6-108, Ref. 5.29), higher conductivity SNF baskets were seen to lower and delay the peak temperatures experienced. The data presented in reference 29 also showed that the choice of the design basis SNF (i.e., heat load) is of key importance. Younger SNF types produce high peak temperatures within the first year which then drop off quickly. Older SNF (at the same initial APD, but not AML) produces lower and later peaks with more stable and higher long-term temperatures. Similar trends are expected for the DHLW waste package and various waste forms which may be placed in the disposal container.

In the following evaluation, only the Pu disposition greenfield glass waste form defined in reference 5.21 has been used in the ANSYS analysis. Any information concerning MGDS DHLW was obtained directly from reference 5.34. The time dependence of the design basis Pu disposition greenfield glass waste form is provided in Attachment III and Attachment VI as provided by MATHCAD V5.0+ using the data provided in reference 5.21 and the assumptions listed in Section 4.3. MATHCAD V5.0+ uses the data provided in assumptions 4.3.4 and 4.3.5, generates the appropriate equation coefficients for the radioactive decay equations, solves the radioactive decay equations to obtain the waste form heat generation rate versus time. Then prints the decay heat data at the desired ANSYS time steps to an ASCII file. The data was then reformatted into a file suitable for direct use by ANSYS. The MATHCAD V5.0+ calculation file is provided as Attachment I and Attachment IV, along with the MATHCAD V5.0+ print file as Attachment II and Attachment V, and the ANSYS readable file created from the MATHCAD V5.0+ print file as Attachment III and Attachment VI.

7.3 3-D Waste Package Model Development

The general philosophy used for this analysis is to create a separate input file for each thermal loading case and is exactly the same as that used in reference 5.34. Since there are only two major differences between individual cases in reference 5.34, i.e., boundary condition and potentially the time dependent heat load data if a different waste form matrix is selected, a base deck (i.e., High Thermal Load #1 Case) was created to capture the basic modeling information. The base deck was then copied for each ANSYS case. Each individual file then had the appropriate boundary condition file from reference 5.13 entered into the input decks. Finally, each case then had the appropriate time dependent heat load data entered into the input decks. For the analysis presented in this report, the only difference between the two ANSYS cases is the time dependent heat load data since only the 100 MTU/acre boundary condition is analyzed for this report (see assumption 4.3.34).

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The basic lay out of each deck follows the following pattern: 1) comment header used to define problem modeled, additional files read by the input deck, and what information is contained in the data files used in the input deck. 2) Define model parameters and dimensions which are use repeatedly. This includes all material properties, reading of boundary condition files, reading of body load files, etc. The ANSYS input decks make use of defined variables which are then used to perform simple calculations concerning units conversions and geometric positions. Many of the MPC basket geometry parameters are reported in reference 5.8 in units of inches. These values were entered into the ANSYS input decks along with the units conversion to meters, assigned a variable name, and the variable name was then used through out the remainder of the input deck to determine the geometry of the basket and the disposal container. Also, units of years are used in the file defining waste form heat loads. The years are converted to seconds for this analysis. The variables are clearly identified and defined via comments included in the ANSYS input deck. 3) Define element types which will be used to perform the solution. 4) Define the model geometry and mesh structure. The approach used is to define all components by first defining the basic key points, then lines, then areas and finally the mesh. Long winded, but it is easily followed and repeated. 5) Define all radiation surfaces and create radiation mesh matrix. The ANSYS AUX12 utility is used to generate all of the required view factors between radiation elements. 6) Apply the body loads and boundary conditions (B.C.'s) to the appropriate geometry components. Since this calculation is time dependent and is intended to provided temperatures at various times through the first 1000 years of repository existence, the loads and B.C.'s are applied at each point in the time scale of the analysis. 7) Finally, selected positions in the glass waste form, pour canisters, and disposal container were selected to have temperatures for each point in time of the analysis echoed to the output file for examination.

Each ANSYS input deck is provided as part of the ANSYS output files in Attachments X and XI. Heat and material input files are provided as Attachments III, VI, VII and the boundary condition file for the 100 MTU/acre thermal loading case is provided in Attachment IX.

The development of any ANSYS model involves the following specific steps:

- 1) Identify the geometry to be modeled.
- 2) Identify the material properties which will be required.
- 3) Identify the assumptions used to model the real geometry and materials.
- 4) Identify the body loads (i.e., heat generation rates in specific materials)
- 5) Identify the boundary conditions/surface loads (i.e., surfaces with known or given temperatures.)
- 6) Specify the problem as steady state or transient. If transient specify the time frame which is to be considered.
- 7) Execute the model generated to obtain solutions for the given conditions.
- 8) Analyze the results to form a conclusion or support an design thesis.

The creation of an ANSYS model for the DHLW waste package conceptual design followed the listed steps. Discussion of some of these steps will be combined for convenience.

- 1) Identify the geometry to be modeled.
- 2) Identify the material properties which will be required.

The geometry and the material composition of each component of Pu disposition greenfield glass waste form, the pour canister, and the disposal container is specified in references 5.21, 5.28, 5.31, and 5.33 for the disposal container (see assumptions in Section 4.3). Notice that the high thermal load and low thermal load waste packages have the same outer barrier thicknesses and material compositions. The disposal container is 0.020 meter thick Alloy 825 with an outer barrier of 0.050 meter thick C71500 copper-nickel alloy.

Since this model is part of a larger calculational scheme as indicated in references 5.34 and 5.13, a 3-D waste package with the surface of the emplacement drift (i.e., a shell) will be modeled (see assumption 4.3.9). The full waste package with four pour canisters is modeled with the waste package placed at the midpoint between two SNF waste packages. The SNF waste packages are not specifically modeled and the pour canister geometry has been modeled as a right circular cylinder. These geometry simplifications have been used as discussed in the outline of the assumptions in Section 4.3. Attachment VIII provides mesh plots of the general lay out of the waste package internals.

Material properties to be used for each component of the design are specified in Section 4.1 along with the references from which they were obtained. The ANSYS file containing this material property data is provided as Attachment VII (see assumptions 4.3.27 through 4.3.33). The material properties for the C71500 are included in the input decks directly (see Attachments X and XI). Attachment VII also includes material properties which were not used in this analysis (i.e., those identified as material ID's 3, 8, 9, 10, 11, 12, and 13 were not used).

- 3) Identify the assumptions used to model the real geometry and materials.

All assumptions used for this ANSYS model are listed in Section 4.3. These assumptions provide all of the required insight for a competent ANSYS user as to why the ANSYS geometry and material selections were entered into the ANSYS input decks in the given fashion. (Including assumptions 4.3.3, 13, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26)

- 4) Identify the body loads (i.e., heat generation rates in specific materials)
- 5) Identify the boundary conditions/surface loads (i.e., surfaces with known or given temperatures.)
- 6) Specify the problem as steady state or transient. If transient specify the time frame which is to be considered.
- 7) Execute the model generated to obtain solutions for the given conditions.

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The material which carries the heat load is the glass waste form and is modeled as a solid material placed in the interior of each pour canister. The heat load is dependant upon the design basis heat load selected and is discussed in Section 7.2. Briefly, the heat loads for the glass waste form volumes were generated from the data provided in reference 5.21 for each of the assumption concerning the fraction of radioactive decay energy which is captured in the glass matrix. The heat load will decrease logarithmically with time as the fission products decay and therefore was created as a function of time. The heat loads were applied volumetrically and were multiplied by an axial heat peaking factor of 1.00 as discussed in Section 4.3.

As indicated in section 7.1, this analysis is part of a two step calculation method. As such the boundary conditions are provided by the calculations performed in reference 5.13. The boundary conditions for each repository thermal loading scenario are applied to the emplacement drift wall surface as a temperature condition to create each of the ANSYS decks (see assumption 4.3.12). The boundary conditions are time dependent, the glass waste form heat generation rate is also time dependent, and therefore the problem is solved at various points in time consistent with the analysis performed in reference 5.34. The boundary conditions and heat loads were applied and solved out to 1000 years for each of the thermal loading scenarios described in Section 7.1 and for the Pu disposition greenfield glass waste form heat load conditions presented in Attachments III and VI. The time span of 1000 years was performed to be consistent with the analysis performed in reference 5.13.

8) Analyze the results to form a conclusion or support an design thesis.

The outputs of each ANSYS execution are provided as Attachments X through XI. Discussion and summary of the ANSYS results are provided in Section 7.4 and conclusions are provided in Section 8.0. Notice that selected data was requested in the input deck and echoed into the output file for ease of use. This data is summarized in Section 7.4.

7.4 3-D Waste Package Analysis Results

All of the results provided in this section were derived from the ANSYS V5.0A executions. These models are presented in the ANSYS output files summarized in Section 9.0 and provided as attachments to this report. All of the assumptions concerning geometry, material composition, boundary conditions, and other inputs are provided in Section 4.3.

Tables 7.4-1 and 7.4-2 summarize the temperature data for each of the cases analyzed. Peak glass matrix, pour canister, and disposal container temperatures are calculated directly in the ANSYS program for each time step and provided in Attachments X and XI. The third column of Table 7.4-1 and 7.4-2 provides the peak pour cansiter surface temperature for the half of the pour canister which faces the center line of the disposal container. The fifth column provides

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the peak pour canister surface temperature for the half of the pour canister which faces the interior surface of the disposal container. The remaining column designations are self-explanatory.

Peak temperatures inside the waste package occur between the time of emplacement and the time of peak drift wall temperatures. At emplacement the glass matrix heat load is at its highest, but the drift is still cool, and by the time of peak drift temperatures, the glass matrix heat load has decayed so that internal waste package temperature drops are lower. As indicated in Table 7.4-1, Table 7.4-2, and reference 5.34 the time of peak temperatures varies depending on thermal loading, WP spacing, and the time-dependent WP decay heat (glass matrix type). For most design basis glass waste forms, peak WP internal temperatures will occur in less than 50 years after emplacement and the waste package surface temperatures do not peak for 60 years or more. By 100 years the temperature drop across the WP (from center to edge) has dropped to less than 15°C. The long times to peak temperatures for the DHLW WP is a result of the fact that the near and far field repository temperatures are driven by the SNF WPs which have a much large heat generation rate than the DHLW WPs.

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Table 7.4-1. High Thermal Load #1; DHLW Pu Disposition Glass Waste Package Thermal Results (100% Decay Energy Captured in the Glass Matrix)

Summary of DHLW/WP Temperatures

Thomas Lotz 05-24-95 PHS/pj

Four Four Canisters with Disposal Container

100 MTU/acre with 16.165 m WP Spacing

0 years aging before emplacement, 853 W (Pu Disposition) design basis Initial Heat Rate (WPD)

Time (years)	Heat Load (W/P. Can.)	ANSYS FEM Temperature Results (Deg. C)					
		Peak Pour Can. Surf. Temp. DCCL	Peak Glass Matrix Temp.	Peak Pour Can. Surf. Temp. DCEX	Peak WP Interior Surf. Temp.	Peak WP Exterior Surf. Temp.	Drift Wall
0	852.93	123.65	132.98	86.63	56.49	55.81	26.14
0.1	851.5	134.49	144.14	98.79	72.26	71.58	46.42
0.2	850.07	139.48	149.26	104.41	79.38	78.70	55.29
0.3	848.64	142.98	152.85	108.37	84.32	83.65	61.36
0.4	847.22	145.73	155.67	111.48	88.19	87.51	66.06
0.5	845.8	148.02	158.00	114.08	91.39	90.71	69.92
0.6	844.38	149.97	160.00	116.31	94.13	93.45	73.22
0.7	842.97	151.69	161.75	118.27	96.53	95.86	76.10
0.8	841.56	153.21	163.30	120.02	98.66	97.99	78.64
0.9	840.15	154.58	164.70	121.60	100.58	99.92	80.93
1	838.75	155.84	165.98	123.05	102.35	101.69	83.03
2	824.89	164.72	174.94	133.42	114.88	114.24	97.82
3	811.35	170.32	180.53	140.12	122.93	122.31	107.22
4	798.11	174.69	184.85	145.42	129.27	128.66	114.60
5	785.17	178.45	188.54	150.03	134.74	134.16	120.93
6	772.53	181.57	191.58	153.91	139.35	138.78	126.24
7	760.17	184.08	194.00	157.11	143.16	142.60	130.64
8	748.09	186.28	196.11	159.95	146.55	146.00	134.54
9	736.28	187.83	197.53	162.06	149.09	148.55	137.50
10	724.74	189.03	198.61	163.79	151.20	150.67	139.97
20	622.75	197.16	205.58	176.16	166.38	165.94	157.78
30	541.52	202.07	209.49	184.19	176.21	175.83	169.24
40	476.77	209.73	209.34	187.14	180.27	179.94	174.32
50	425.09	201.93	207.77	187.91	181.91	181.62	176.67
60	383.79	200.52	205.78	187.89	182.22	182.11	177.71
70	350.75	198.78	203.57	187.19	182.17	181.92	177.18
80	324.27	196.65	201.05	185.86	181.18	180.96	177.18
90	303	194.75	198.85	184.62	180.21	180.00	176.45
100	285.89	193.06	196.92	183.46	179.27	179.07	175.70
200	220.49	185.03	187.95	177.45	174.08	173.92	171.24
300	207.87	180.09	182.81	172.82	169.54	169.39	166.78
400	202.12	177.52	180.15	170.40	167.15	167.01	164.42
500	197.97	175.83	178.40	168.82	165.60	165.46	162.90
600	194.56	173.93	176.44	167.00	163.80	163.66	161.11
700	191.63	171.72	174.18	164.85	161.64	161.50	158.95
800	189.05	169.32	171.73	162.49	159.27	159.13	156.57
900	186.76	167.02	169.38	160.22	156.98	156.84	154.27
1000	184.69	164.92	167.25	158.15	154.90	154.77	152.18

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Table 7.4-2. High Thermal Load #1; DHLW Pu Disposition Glass Waste Package Thermal Results (100% Minus Neutrino Decay Energy Captured in the Glass Matrix)

Summary of DHLW/WP Temperatures

Thomas Lotz 06-03-95 11:00:00

Four Four Canisters with Disposal Container

100 MTU/acre with 16.165 m WP Spacing

0 years aging before emplacement, 681 W (Pu Disposition) design basis Initial Heat Rate (WPD)

Time (years)	ANSYS FEM Temperature Results (Deg. C)						
	Heat Load (W/P. Can.)	Peak Pour Can. Surf. Temp. DCCL	Peak Glass Matrix Temp.	Peak Pour Can. Surf. Temp. DCEX	Peak WP Interior Surf. Temp.	Peak WP Exterior Surf. Temp.	Drift Wall
0	680.63	107.69	114.77	76.95	51.00	50.45	26.14
0.1	679.59	119.67	127.04	90.09	67.50	66.95	46.42
0.2	678.56	125.17	132.66	96.13	74.91	74.37	55.29
0.3	677.53	129.01	136.59	100.38	80.05	79.50	61.36
0.4	676.5	132.03	139.67	103.71	84.06	83.51	66.06
0.5	675.48	134.53	142.22	106.49	87.37	86.83	69.92
0.6	674.45	136.68	144.41	108.87	90.21	89.67	73.22
0.7	673.43	138.57	146.33	110.97	92.70	92.16	76.10
0.8	672.41	140.24	148.04	112.83	94.90	94.36	78.64
0.9	671.4	141.75	149.57	114.52	96.89	96.35	80.93
1	670.38	143.14	150.98	116.07	98.72	98.18	83.03
2	660.37	152.95	160.90	127.14	111.67	111.15	97.82
3	650.58	159.19	167.16	134.29	119.97	119.47	107.22
4	641.02	164.08	172.05	139.95	126.52	126.03	114.60
5	631.67	168.31	176.25	144.86	132.16	131.69	120.93
6	622.53	171.83	179.74	149.01	136.91	136.45	126.24
7	613.6	174.71	182.56	152.43	140.84	140.39	130.64
8	604.87	177.25	185.03	155.48	144.33	143.89	134.54
9	596.33	179.08	186.79	157.75	146.97	146.53	137.50
10	587.99	180.54	188.18	159.63	149.16	148.73	139.97
20	514.21	190.76	197.62	173.14	164.92	164.56	157.78
30	455.37	197.14	203.32	181.92	175.12	174.80	169.24
40	408.39	199.91	204.46	185.37	179.43	179.15	174.32
50	370.82	198.85	203.92	186.59	181.25	180.99	176.67
60	340.72	198.07	202.71	186.76	181.82	181.53	177.71
70	316.56	196.82	201.13	186.31	181.75	181.53	177.18
80	297.13	195.08	199.10	185.16	180.85	180.65	176.45
90	281.47	193.50	197.30	184.06	179.95	179.75	176.45
100	268.8	192.06	195.68	183.01	179.06	178.87	175.70
200	218.79	184.93	187.82	177.40	174.06	173.90	171.24
300	207.7	180.07	182.79	172.82	169.54	169.39	166.78
400	202.1	177.52	180.14	170.40	167.15	167.01	164.42
500	197.96	175.83	178.40	168.82	165.60	165.46	162.90
600	194.56	173.93	176.44	167.00	163.80	163.66	161.11
700	191.63	171.72	174.18	164.85	161.64	161.50	158.95
800	189.05	169.32	171.73	162.49	159.27	159.13	156.57
900	186.76	167.02	169.38	160.22	156.98	156.84	154.27
1000	184.69	164.92	167.25	158.15	154.90	154.77	152.18

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8. Conclusions

Table 8-1 summarizes the peak temperatures and the time of occurrence for each of the cases analyzed. The thermal loading scenarios indicated in Table 8-1 are defined in Table 7.1-1, and the design basis glass heat load descriptions are defined and discussed in Section 7.2. Peak glass matrix, pour canister, and disposal container temperatures are calculated directly in the ANSYS program.

Table 8-1. DHLW Pu Disposition Glass Thermal Analysis Results Summary

Thermal Load	Design Basis Heat Load	Peak Glass Matrix		Peak Pour Canister Outer Surface		Peak WP Outer Surface		Peak WP Outer Surface	
		°C	yrs	°C	yrs	°C	yrs	°C	yrs
High #1	Total	210	30	203	40	182	60	178	70
High #1	Total Minus Neutrinos	204	40	199	40	182	60	178	70

The repository thermal loading has not been specified by the MGDS program and will not be finally established for years. Therefore, the thermal evaluation of the DHLW disposal container conceptual design with the Pu disposition greenfield glass waste form with respect to the repository has considered a number of thermal loading scenarios. For this analysis, the most limiting thermal loading scenario from reference 5.34 was selected as a bounding case. For each repository thermal loading scenario analyzed, a 3-D repository emplacement (reference 5.13) and 3-D waste package evaluation were performed. As indicated by the data provided in Table 8-1, the peak glass matrix temperatures remain below 500°C and the temperatures for the materials used in the DHLW disposal container conceptual design is not such that melting or rapid mechanical failure would occur.

The results of the thermal evaluations indicate that the DHLW disposal container conceptual design with the Pu disposition greenfield glass waste form can satisfy the thermal limitations (i.e., goals) specified in Section 4.2.5 during normal expected conditions for disposal in the MGDS and therefore has a reasonable chance to meet the MGDS requirements for permanent disposal. Thus, this DHLW disposal container conceptual design may be used as a point of departure for analysis of designs put forth by the disposal container manufacturers. However, two points should be noted: 1) more analysis is required to determine conditions for anticipated off-normal conditions, drift backfill, and for the vendor specific designs and 2) this analysis relies on input data which is TBV. These items need to be addressed in any work which utilizes these results.

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9. Attachments

The attachments included are summarized in Table 9-1.

Table 9-1. Attachments of Supporting Documentation for the DHLW Disposal Container Loaded with Pu/Cs Greenfield Glass Analysis

Attachment Number	Title / Description	# of Pages
I	MATHCAD File Listing Determine the Pu/Cs Greenfield Glass Heat Load (File name: pucswpai.mcd)	9
II	MATHCAD Print File of Pu/Cs Greenfield Glass Heat Load Versus ANSYS Time Steps (File name: puglshg.prn)	2
III	ANSYS ready input created from MATHCAD Print File. (File name: pusgls2.dat)	1
IV	MATHCAD File Listing Determine the Pu/Cs Greenfield Glass Heat Load (File name: pucswpav.mcd)	9
V	MATHCAD Print File of Pu/Cs Greenfield Glass Heat Load Versus ANSYS Time Steps (File name: puglshg1.prn)	2
VI	ANSYS ready input created from MATHCAD Print File. (File name: pusgls3.dat)	1
VII	Material Properties File for ANSYS; Data from Section 4.1. (File name: propsd1.dat)	3
VIII	Model Mesh Plots of Geometry	3
IX	Boundary Condition File for High Thermal Load #1; from Reference 5.13 (File name: c21x5a.parm used in Attachment XII)	11
X	ANSYS Output for the 100 MTU/acre Thermal Loading for the Pu/CS Greenfield Glass Loaded DHLW Disposal Container - 100% Heat Load (WP Spacing: 16.2 m; Drift Spacing: 22.5 m)	182
XI	ANSYS Output for the 100 MTU/acre Thermal Loading for the Pu/CS Greenfield Glass Loaded DHLW Disposal Container - 100% Heat Load less Neutrino's carry off of 65% of Beta decay. (WP Spacing: 16.2 m; Drift Spacing: 22.5 m)	182

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Pu Disposition Heat Load Calculations for Greenfield Glass:

1) Read in data from reference 5.13 to obtain ANSYS time steps,
file setup is as follows:

Column 1 = Time step in years; MGDS emplacement is $t=0$

Column 2 = W/Assembly for 10 year old/ 49 GWd/MTU BWR SNF (Not Used)

Column 3 = W/Assembly for 10 year old/ 48 GWd/MTU PWR SNF (Not Used)

Number of rows = nl

HL := READPRN(heatfile)

nl := rows(HL) nl = 101

Set index range: i := 1..nl

2) Break matrix into respective vectors for processing (i.e., get vector of ANSYS
time steps isolated to generate the required ANSYS heat load input):

T := HL^{<1>}

BWR := HL^{<2>}

PWR := HL^{<3>}

Echo the time steps to show that they are indeed the ANSYS time steps plus 10 years:

i1 := 1..15 i2 := 16..30 i3 := 31..45 i4 := 46..60

i5 := 61..75 i6 := 76..90 i7 := 91..nl

T _{i1}	T _{i2}	T _{i3}	T _{i4}	T _{i5}	T _{i6}	T _{i7}
1·10 ⁻⁶	0.35	2	9.5	80	650	5000
0.01	0.4	2.5	10	85	700	5500
0.02	0.45	3	15	90	750	6000
0.03	0.5	3.5	20	95	800	6500
0.04	0.55	4	25	100	850	7000
0.05	0.6	4.5	30	150	900	7500
0.06	0.65	5	35	200	950	8000
0.07	0.7	5.5	40	250	1000	8500
0.08	0.75	6	45	300	1500	9000
0.09	0.8	6.5	50	350	2000	9500
0.1	0.85	7	55	400	2500	10000
0.15	0.9	7.5	60	450	3000	
0.2	0.95	8	65	500	3500	
0.25	1	8.5	70	550	4000	
0.3	1.5	9	75	600	4500	

3) Identify the basic assumptions used to generate a bounding heat load:

- 3.1) 87,000 Ci of Cs (approximately 1 kg Cs) is used as a spike material per SRP pour canister. (See assumption 4.3.4 and Ref. 5.21)
- 3.2) All of the Cs is Cs-137 with a 30 year half life. (See assumption 4.3.6)
- 3.3) All of the Cs-137 decay energy, including gamma radiation, neutrinos, etc. is captured in the glass matrix (See assumption 4.3.7)
- 3.4) The mass of Pu emplaced in the glass is equal to 5% of the mass of glass. (see assumption 4.3.4 and Ref. 5.21)
- 3.5) The Pu is composed of the following isotopes: Pu-238, Pu-239, Pu-240, Pu-241, and Am-241 with the following wt% respectively: 0.05%, 93.3%, 5.9%, 0.35%, and 0.4%. (See assumption 4.3.4 and Ref. 5.21)
- 3.6) All glass is emplaced in the repository with an insignificant aging time (i.e., at time of manufacture of glass the pour canister is quickly emplaced in the MGDS) (See assumption 4.3.8)

Create MATHCAD variables for this information:

j = index indicating the Pu isotope as follows:

$j=1$ for Pu-238 data

$j=2$ for Pu-239 data

$j=3$ for Pu-240 data

$j=4$ for Pu-241 data

$j=5$ for Am-241 data

PuI = weight percent of total Pu which is each j -th isotope

PuG = weight percent of glass which is Pu

$CuriesCs$ = Curies of Cs-137 mixed into the glass

$j := 1..5$

$PuG := 0.05$

$PuI_j :=$

$CuriesCs := 87000.$

0.0005
0.933
0.059
0.0035
0.004

Check weight percents to ensure 100% is accounted for:

$$\sum_{n=1}^5 PuI_n = 1$$

4) Identify the basic data required for each isotope:

4.1) Reference 5.1, page 399 provides the following data for Cs-137:

Cs-137 Decays by Beta to Ba-137 which by two possible modes:

- 1) Beta decay directly to ground state Ba-137; Beta MeV: 1.176 (6.5%)
- 2) Beta decay to excited state Ba-137 which then emits a gamma via an IT transition to get to ground state; Beta MeV: 0.514 (93.5%) then Ba-137 gamma MeV: 0.6616

Assuming all energy deposited in the glass; then each decay provides 1.176 MeV.

Now define the MATHCAD variables:

Cshfl = Cs-137 half life in years

CsMeV = Cs-137 decay energy in MeV

Cshfl := 30

CsMeV := 1.176

4.2) Reference 5.8, pp. 976 and 977 provided the following data for each Pu isotope specified in 3.5 above.

Puhfl = Half life of the j-th isotope in years (see part 3 above)

Puamu = Atomic mass of the j-th isotope in atomic mass units (amu)

Pumev = Decay energy of the j-th isotope in MeV. (All decay by alpha particle emission)

Puhfl_j :=

86
24400
6580
13.2
458

Puamu_j :=

238.0495
239.0522
240.0539
241.0567
241.0567

Pumev_j :=

5.592
5.243
5.255
0.007
5.640

5) Define required conversion, math, or physical constants:

$$Ci := 3.7 \cdot 10^{10} \quad \text{/second} \quad (\# \text{ decays per second; see Ref. 5.1, page 420})$$

$$J_{\text{perMeV}} := 1.60210 \cdot 10^{-13} \quad (\text{Joules / MeV conversion; Ref. 5.8, page 935})$$

$$N := 6.022045 \cdot 10^{23} \quad \text{/(g mole)} \quad (\text{Avogadro's number; Ref. 5.8, page 933})$$

6) Define mathematical functions for repetitious calculations:

6.1) Radioactive decay is governed by the function (Ref. 5.8, p. 28):

A = Initial amount of material decaying.

L = Decay constant of material decaying ($L = \ln(2)/\text{Half Life}$).

T = Time over which the material has decayed.

$$D(A, L, T) := A \cdot e^{-L \cdot T}$$

6.2) Convert half life (i.e., X) in years to a decay constant in "/years":

$$\text{Lampy}(X) := \frac{\ln(2.0)}{X}$$

6.3) Convert half life (i.e., X) in years to a decay constant in "/seconds":

$$\text{Lamps}(X) := \left(\frac{1.0}{365 \cdot 24 \cdot 60 \cdot 60} \right) \cdot \frac{\ln(2.0)}{X}$$

6.4) Convert mass of material to number of atoms of the material (p. 28, Ref. 5.8):

W = mass of material in grams.

A = mass of one mole of material in grams (= to amu's).

N = Avogadro's Constant.

$$\text{Num}(A, W) := N \cdot \frac{W}{A}$$

6.5) Calculate the activity of the material in Curies (p. 28, Ref. 5.8):

L = Decay constant of material in units of "/second".

NA = Number of atoms of material.

Ci = Conversion of decays/second to Curies.

$$Ci(L, NA) := L \cdot \frac{NA}{Ci}$$

6.6) Convert the heat generation of decay of the material into Watts:

C = Activity of material in Curies.

E = Energy of decay in MeV for the material.

Ci = Conversion of decays/second to Curies.

JperMeV = Units conversion constant for MeV to Joules

$$Watts(C, E) := C \cdot Ci \cdot E \cdot JperMeV$$

7) Determine the mass and number of atoms of each constituent isotope of Pu in grams.
Assumption 4.3.4 and Ref. 5.21 set the mass of the greenfield glass as 1680 kg.

New MATHCAD Variables: Wtglass = mass of glass in kg

gmsPu = Total mass of Pu in grams

Pugms = Mass of each isotope of Pu in grams

PuNum = Number of atoms of each isotope of Pu

$$Wtglass := 1680$$

$$gmsPu := PuG \cdot Wtglass \cdot 1000.0$$

$$gmsPu = 84000$$

$$Pugms_j := PuI_j \cdot gmsPu$$

$$PuNum_j := Num(Puamu_j, Pugms_j)$$

Remember:

j=1 Pu-238:

j=2 Pu-239:

j=3 Pu-240:

j=4 Pu-241:

j=5 Am-241:

Pugms_j

42
78372
4956
294
336

PuNum_j

$1.06249284 \cdot 10^{23}$
$1.97429562 \cdot 10^{26}$
$1.24327307 \cdot 10^{25}$
$7.34466717 \cdot 10^{23}$
$8.39390533 \cdot 10^{23}$

8) Determine the decay constants in "/second" and "/year" and the curies of each constituent isotope of Pu and for Cs-137.

New MATHCAD Variables: Pulam = Decay constant of each Pu isotope in "/s".
 PuL = Decay constant of each Pu isotope in "/year".
 Cslam = Decay constant of Cs-137 in "/s".
 CsL = Decay constant of Cs-137 in "/year".
 PuCi = Curies of each Pu isotope.

$$\text{Pulam}_j := \text{Lamps}(\text{Puhfl}_j)$$

Pulam_j

$2.55576197 \cdot 10^{-10}$
$9.00801349 \cdot 10^{-13}$
$3.34035759 \cdot 10^{-12}$
$1.66511764 \cdot 10^{-9}$
$4.79902902 \cdot 10^{-11}$

$$\text{PuL}_j := \text{Lampy}(\text{Puhfl}_j)$$

PuL_j

0.00805985
0.00002841
0.00010534
0.05251115
0.00151342

$$\text{Cslam} := \text{Lamps}(\text{Cshfl})$$

$$\text{Cslam} = 7.32651764 \cdot 10^{-10}$$

$$\text{CsL} := \text{Lampy}(\text{Cshfl})$$

$$\text{CsL} = 0.02310491$$

$$\text{PuCi}_j := \text{CiI}(\text{Pulam}_j, \text{PuNum}_j)$$

PuCi_j

733.91318844
4806.61663463
1122.42611982
33053.33755375
1088.71879154

$$\text{CuriesCs} = 87000$$

9) Determine the initial heat in Watts for each constituent isotope of Pu and for Cs-137.

New MATHCAD Variables: PuWatts = Heat in Watts generated by each Pu isotope.

CsWatts = Heat in Watts generated by Cs-137.

$$\text{PuWatts}_j := \text{Watts}(\text{PuCi}_j, \text{Pumev}_j)$$

$$\text{CsWatts} := \text{Watts}(\text{CuriesCs}, \text{CsMeV})$$

$$\text{PuWatts}_j$$

$$\text{CsWatts} = 606.48200424$$

24.32782031
149.38627129
34.96405779
1.37152808
36.39872469

10) Decay the curies and watts of each isotope for the time steps desired for the ANSYS input heat load file and then calculate the total watts and curies for a pour cansiter:

Heat in Watts versus time:

$$\text{HGCs}_i := D(\text{CsWatts}, \text{CsL}, T_i)$$

$$\text{Pu238HG}_i := D(\text{PuWatts}_1, \text{PuL}_1, T_i)$$

$$\text{Pu239HG}_i := D(\text{PuWatts}_2, \text{PuL}_2, T_i)$$

$$\text{Pu240HG}_i := D(\text{PuWatts}_3, \text{PuL}_3, T_i)$$

$$\text{Pu241HG}_i := D(\text{PuWatts}_4, \text{PuL}_4, T_i)$$

$$\text{Am241HG}_i := D(\text{PuWatts}_5, \text{PuL}_5, T_i)$$

Curies versus time:

$$\text{CiCs}_i := D(\text{CuriesCs}, \text{CsL}, T_i)$$

$$\text{Pu238Ci}_i := D(\text{PuCi}_1, \text{PuL}_1, T_i)$$

$$\text{Pu239Ci}_i := D(\text{PuCi}_2, \text{PuL}_2, T_i)$$

$$\text{Pu240Ci}_i := D(\text{PuCi}_3, \text{PuL}_3, T_i)$$

$$\text{Pu241Ci}_i := D(\text{PuCi}_4, \text{PuL}_4, T_i)$$

$$\text{Am241Ci}_i := D(\text{PuCi}_5, \text{PuL}_5, T_i)$$

$$\text{HGtot}_i := \text{HGCs}_i + \text{Pu238HG}_i + \text{Pu239HG}_i + \text{Pu240HG}_i + \text{Pu241HG}_i + \text{Am241HG}_i$$

$$\text{Citot}_i := \text{CiCs}_i + \text{Pu238Ci}_i + \text{Pu239Ci}_i + \text{Pu240Ci}_i + \text{Pu241Ci}_i + \text{Am241Ci}_i$$

11) Echo the individual isotope and total heat load values in watts for ANSYS times of initial emplacement (0.000001 years), 10 years, and 1000 years for quick check purposes:

$T_1 = 1 \cdot 10^{-6}$	$T_{47} = 10$	$T_{83} = 1000$
HGCS ₁ = 606.48199023	HGCS ₄₇ = 481.36508577	HGCS ₈₃ = $5.60382714 \cdot 10^{-8}$
Pu238HG ₁ = 24.32782011	Pu238HG ₄₇ = 22.44397165	Pu238HG ₈₃ = 0.00768696
Pu239HG ₁ = 149.38627128	Pu239HG ₄₇ = 149.34384015	Pu239HG ₈₃ = 145.20226549
Pu240HG ₁ = 34.96405779	Pu240HG ₄₇ = 34.92724551	Pu240HG ₈₃ = 31.46824987
Pu241HG ₁ = 1.37152801	Pu241HG ₄₇ = 0.81124433	Pu241HG ₈₃ = 0
Am241HG ₁ = 36.39872464	Am241HG ₄₇ = 35.85200598	Am241HG ₈₃ = 8.01337441
HGtot ₁ = 852.93039205	HGtot ₄₇ = 724.74339339	HGtot ₈₃ = 184.69157678

12) Echo the individual isotope and total activity values in curies for ANSYS times of initial emplacement (0.000001 years), 10 years, and 1000 years for quick check purposes:

$T_1 = 1 \cdot 10^{-6}$	$T_{47} = 10$	$T_{83} = 1000$
CiCs ₁ = 86999.99798987	CiCs ₄₇ = 69051.94576062	CiCs ₈₃ = 0.00000804
Pu238Ci ₁ = 733.91318252	Pu238Ci ₄₇ = 677.08189992	Pu238Ci ₈₃ = 0.23189741
Pu239Ci ₁ = 4806.61663449	Pu239Ci ₄₇ = 4805.2513807	Pu239Ci ₈₃ = 4671.99307325
Pu240HG ₁ = 34.96405779	Pu240HG ₄₇ = 34.92724551	Pu240HG ₈₃ = 31.46824987
Pu241Ci ₁ = 33053.33581808	Pu241Ci ₄₇ = 19550.69910737	Pu241Ci ₈₃ = 0
Am241Ci ₁ = 1088.71878989	Am241Ci ₄₇ = 1072.36594003	Am241Ci ₈₃ = 239.68727951
Citot ₁ = 127805.00853456	Citot ₄₇ = 96278.58845031	Citot ₈₃ = 5922.11495856

- 13) Create a matrix of all of the heat load data calculate and save to a MATHCAD print file for translation of the total heat load data into an ANSYS heat load input file:

$A^{<1>} := T$ $A^{<2>} := HG_{tot}$ $A^{<3>} := HGCs$ $A^{<4>} := Pu238HG$

$A^{<5>} := Pu239HG$ $A^{<6>} := Pu240HG$ $A^{<7>} := Pu241HG$ $A^{<8>} := Am241HG$

$WRITEPRN(PUGLSHG) := A$

1e-006	852.93	606.48	24.328	149.39	34.964	1.3715	36.399
0.01	852.79	606.34	24.326	149.39	34.964	1.3708	36.398
0.02	852.64	606.2	24.324	149.39	34.964	1.3701	36.398
0.03	852.5	606.06	24.322	149.39	34.964	1.3694	36.397
0.04	852.36	605.92	24.32	149.39	34.964	1.3687	36.397
0.05	852.21	605.78	24.318	149.39	34.964	1.3679	36.396
0.06	852.07	605.64	24.316	149.39	34.964	1.3672	36.395
0.07	851.93	605.5	24.314	149.39	34.964	1.3665	36.395
0.08	851.78	605.36	24.312	149.39	34.964	1.3658	36.394
0.09	851.64	605.22	24.31	149.39	34.964	1.3651	36.394
0.1	851.5	605.08	24.308	149.39	34.964	1.3643	36.393
0.15	850.78	604.38	24.298	149.39	34.964	1.3608	36.39
0.2	850.07	603.69	24.289	149.39	34.963	1.3572	36.388
0.25	849.35	602.99	24.279	149.39	34.963	1.3536	36.385
0.3	848.64	602.29	24.269	149.38	34.963	1.3501	36.382
0.35	847.93	601.6	24.259	149.38	34.963	1.3466	36.379
0.4	847.22	600.9	24.25	149.38	34.963	1.343	36.377
0.45	846.51	600.21	24.24	149.38	34.962	1.3395	36.374
0.5	845.8	599.52	24.23	149.38	34.962	1.336	36.371
0.55	845.09	598.82	24.22	149.38	34.962	1.3325	36.368
0.6	844.38	598.13	24.21	149.38	34.962	1.329	36.366
0.65	843.68	597.44	24.201	149.38	34.962	1.3255	36.363
0.7	842.97	596.75	24.191	149.38	34.961	1.322	36.36
0.75	842.26	596.06	24.181	149.38	34.961	1.3186	36.357
0.8	841.56	595.37	24.171	149.38	34.961	1.3151	36.355
0.85	840.86	594.69	24.162	149.38	34.961	1.3117	36.352
0.9	840.15	594	24.152	149.38	34.961	1.3082	36.349
0.95	839.45	593.31	24.142	149.38	34.961	1.3048	36.346
1	838.75	592.63	24.133	149.38	34.96	1.3014	36.344
1.5	831.78	585.82	24.035	149.38	34.959	1.2676	36.316
2	824.89	579.09	23.939	149.38	34.957	1.2348	36.289
2.5	818.08	572.44	23.843	149.38	34.955	1.2028	36.261
3	811.35	565.87	23.747	149.37	34.953	1.1716	36.234
3.5	804.69	559.37	23.651	149.37	34.951	1.1413	36.206
4	798.11	552.94	23.556	149.37	34.949	1.1117	36.179
4.5	791.6	546.59	23.461	149.37	34.947	1.0829	36.152
5	785.17	540.31	23.367	149.37	34.946	1.0548	36.124
5.5	778.81	534.11	23.273	149.36	34.944	1.0275	36.097
6	772.53	527.97	23.179	149.36	34.942	1.0009	36.07
6.5	766.31	521.91	23.086	149.36	34.94	0.97492	36.042
7	760.17	515.91	22.993	149.36	34.938	0.94966	36.015
7.5	754.09	509.99	22.901	149.35	34.936	0.92505	35.988
8	748.09	504.13	22.809	149.35	34.935	0.90108	35.961
8.5	742.15	498.34	22.717	149.35	34.933	0.87773	35.933
9	736.28	492.62	22.626	149.35	34.931	0.85498	35.906
9.5	730.48	486.96	22.535	149.35	34.929	0.83283	35.879
10	724.74	481.37	22.444	149.34	34.927	0.81124	35.852
15	670.84	428.85	21.557	149.32	34.909	0.62391	35.582
20	622.75	382.06	20.706	149.3	34.89	0.47984	35.313
25	579.83	340.38	19.888	149.28	34.872	0.36904	35.047
30	541.52	303.24	19.103	149.26	34.854	0.28382	34.783
35	507.32	270.16	18.348	149.24	34.835	0.21828	34.521
40	476.77	240.68	17.623	149.22	34.817	0.16788	34.261
45	449.48	214.42	16.927	149.2	34.799	0.12911	34.002
50	425.09	191.03	16.259	149.17	34.78	0.099298	33.746
55	403.29	170.19	15.617	149.15	34.762	0.076368	33.492
60	383.79	151.62	15	149.13	34.744	0.058734	33.239
65	366.36	135.08	14.407	149.11	34.725	0.045171	32.989
70	350.75	120.34	13.838	149.09	34.707	0.03474	32.74
75	336.78	107.21	13.292	149.07	34.689	0.026718	32.493
80	324.27	95.515	12.767	149.05	34.671	0.020549	32.248
85	313.06	85.094	12.262	149.03	34.652	0.015804	32.005
90	303	75.81	11.778	149	34.634	0.012154	31.764
95	293.99	67.539	11.313	148.98	34.616	0.0093476	31.524
100	285.89	60.171	10.866	148.96	34.598	0.0071891	31.287
150	238.39	18.953	7.2619	148.75	34.416	0.00052049	29.007
200	220.49	5.9697	4.8533	148.54	34.235	3.7683e-005	26.893
250	212.44	1.8803	3.2435	148.33	34.055	2.7282e-006	24.933
300	207.87	0.59227	2.1677	148.12	33.876	1.9752e-007	23.116
350	204.67	0.18655	1.4487	147.91	33.698	1.43e-008	21.431

400	202.12	0.05876	0.9682	147.7	33.521	1.0353e-009	19.869
450	199.92	0.018508	0.64706	147.49	33.345	7.4958e-011	18.421
500	197.97	0.0058298	0.43244	147.28	33.17	5.4269e-012	17.079
550	196.19	0.0018363	0.28901	147.07	32.996	3.9291e-013	15.834
600	194.56	0.00057839	0.19315	146.86	32.823	2.8446e-014	14.68
650	193.04	0.00018218	0.12909	146.65	32.65	2.0595e-015	13.61
700	191.63	5.7383e-005	0.08627	146.45	32.479	1.4911e-016	12.618
750	190.3	1.8075e-005	0.057656	146.24	32.308	1.0795e-017	11.699
800	189.05	5.6931e-006	0.038532	146.03	32.138	7.8156e-019	10.846
850	187.87	1.7932e-006	0.025752	145.82	31.969	5.6584e-020	10.056
900	186.76	5.6483e-007	0.01721	145.62	31.801	4.0967e-021	9.3227
950	185.7	1.7791e-007	0.011502	145.41	31.634	2.966e-022	8.6433
1000	184.69	5.6038e-008	0.007687	145.2	31.468	2.1473e-023	8.0134
1500	176.77	5.3866e-013	0.00013664	143.15	29.854	8.4967e-035	3.7599
2000	171.22	5.1779e-018	2.4289e-006	141.14	28.322	3.362e-046	1.7642
2500	166.84	4.9772e-023	4.3175e-008	139.14	26.869	1.3303e-057	0.82777
3000	163.06	4.7843e-028	7.6746e-010	137.18	25.49	5.2638e-069	0.3884
3500	159.61	4.5989e-033	1.3642e-011	135.25	24.182	2.0828e-080	0.18224
4000	156.37	4.4206e-038	2.425e-013	133.34	22.942	8.2413e-092	0.085507
4500	153.26	4.2493e-043	4.3106e-015	131.46	21.765	3.2609e-103	0.040121
5000	150.27	4.0846e-048	7.6623e-017	129.61	20.648	1.2903e-114	0.018825
5500	147.38	3.9263e-053	1.362e-018	127.78	19.588	5.1055e-126	0.0088328
6000	144.56	3.7741e-058	2.4211e-020	125.98	18.583	2.0202e-137	0.0041444
6500	141.83	3.6279e-063	4.3036e-022	124.2	17.63	7.9935e-149	0.0019446
7000	139.17	3.4873e-068	7.65e-024	122.45	16.725	3.1629e-160	0.00091241
7500	136.59	3.3521e-073	1.3598e-025	120.72	15.867	1.2515e-171	0.00042811
8000	134.07	3.2222e-078	2.4172e-027	119.02	15.053	4.952e-183	0.00020087
8500	131.62	3.0973e-083	4.2967e-029	117.34	14.281	1.9594e-194	9.4251e-005
9000	129.23	2.9773e-088	7.6377e-031	115.68	13.548	7.7532e-206	4.4223e-005
9500	126.91	2.8619e-093	1.3577e-032	114.05	12.853	3.0678e-217	2.075e-005
10000	124.64	2.751e-098	2.4133e-034	112.44	12.194	1.2139e-228	9.736e-006

```

/COM, *****
/COM, ** History of DHLW GLASS POUR CANISTER Heat Generation Rates **
/COM, ** Output Calculated by T. L. Lotz 5/09/95 for ORNL Report Data **
/COM, **
/COM, ** Executable File Name: MATHCAD.EXE **
/COM, ** Output File Name: pusgls2.dat **
/COM, ** Execution Date: 05/08/95 **
/COM, ** Start Age (years): 0.0 **
/COM, ** Decay Period (years): 10000 **
/COM, ** Enrichment (kg Pu): N.A. **
/COM, ** Burnup (Mwd/MTHM): N.A. **
/COM, ** Assembly Type: SR Pour Canisters **
/COM, ** Pu Fract. (kg Pu/KG HM):N.A. **
/COM, **
/COM, ** ASSY(1) is the Pour Canister heat in Watts. **
/COM, ** ASSY(0) is the time post emplacement in years. **
/COM, *****
ASSY( 1,1)= 852.93, 852.79, 852.64, 852.50, 852.36, 852.21,
ASSY( 7,1)= 852.07, 851.93, 851.78, 851.64, 851.50, 850.78,
ASSY(13,1)= 850.07, 849.35, 848.64, 847.93, 847.22, 846.51,
ASSY(19,1)= 845.80, 845.09, 844.38, 843.68, 842.97, 842.26,
ASSY(25,1)= 841.56, 840.86, 840.15, 839.45, 838.75, 831.78,
ASSY(31,1)= 824.89, 818.08, 811.35, 804.69, 798.11, 791.60,
ASSY(37,1)= 785.17, 778.81, 772.53, 766.31, 760.17, 754.09,
ASSY(43,1)= 748.09, 742.15, 736.28, 730.48, 724.74, 670.84,
ASSY(49,1)= 622.75, 579.83, 541.52, 507.32, 476.77, 449.48,
ASSY(55,1)= 425.09, 403.29, 383.79, 366.36, 350.75, 336.78,
ASSY(61,1)= 324.27, 313.06, 303.00, 293.99, 285.89, 238.39,
ASSY(67,1)= 220.49, 212.44, 207.87, 204.67, 202.12, 199.92,
ASSY(73,1)= 197.97, 196.19, 194.56, 193.04, 191.63, 190.30,
ASSY(79,1)= 189.05, 187.87, 186.76, 185.70, 184.69, 176.77,
ASSY(85,1)= 171.22, 166.84, 163.06, 159.61, 156.37, 153.26,
ASSY(91,1)= 150.27, 147.38, 144.56, 141.83, 139.17, 136.59,
ASSY(97,1)= 134.07, 131.62, 129.23, 126.91, 124.64,
ASSY( 1,0)= 0.000001, 0.01, 0.02, 0.03, 0.04, 0.05,
ASSY( 7,0)= 0.06, 0.07, 0.08, 0.09, 0.10, 0.15,
ASSY(13,0)= 0.20, 0.25, 0.30, 0.35, 0.40, 0.45,
ASSY(19,0)= 0.50, 0.55, 0.60, 0.65, 0.70, 0.75,
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ASSY(61,0)= 80.00, 85.00, 90.00, 95.00, 100.00, 150.00,
ASSY(67,0)= 200.00, 250.00, 300.00, 350.00, 400.00, 450.00,
ASSY(73,0)= 500.00, 550.00, 600.00, 650.00, 700.00, 750.00,
ASSY(79,0)= 800.00, 850.00, 900.00, 950.00, 1000.00, 1500.00,
ASSY(85,0)= 2000.00, 2500.00, 3000.00, 3500.00, 4000.00, 4500.00,
ASSY(91,0)= 5000.00, 5500.00, 6000.00, 6500.00, 7000.00, 7500.00,
ASSY(97,0)= 8000.00, 8500.00, 9000.00, 9500.00, 10000.00,
ASSY( 0,1)=1.0
/COM, *****
/EOF

```

Pu Disposition Heat Load Calculations for Greenfield Glass:

1) Read in data from reference 5.13 to obtain ANSYS time steps,
file setup is as follows:

Column 1 = Time step in years; MGDS emplacement is $t=0$

Column 2 = W/Assembly for 10 year old/ 49 GWd/MTU BWR SNF (Not Used)

Column 3 = W/Assembly for 10 year old/ 48 GWd/MTU PWR SNF (Not Used)

Number of rows = nl

HL := READPRN(heatfile)

nl := rows(HL) nl = 101

Set index range: i := 1 .. nl

2) Break matrix into respective vectors for processing (i.e., get vector of ANSYS
time steps isolated to generate the required ANSYS heat load input):

T := HL^{<1>}

BWR := HL^{<2>}

PWR := HL^{<3>}

Echo the time steps to show that they are indeed the ANSYS time steps plus 10 years:

i1 := 1 .. 15 i2 := 16 .. 30 i3 := 31 .. 45 i4 := 46 .. 60

i5 := 61 .. 75 i6 := 76 .. 90 i7 := 91 .. nl

T _{i1}	T _{i2}	T _{i3}	T _{i4}	T _{i5}	T _{i6}	T _{i7}
1·10 ⁻⁶	0.35	2	9.5	80	650	5000
0.01	0.4	2.5	10	85	700	5500
0.02	0.45	3	15	90	750	6000
0.03	0.5	3.5	20	95	800	6500
0.04	0.55	4	25	100	850	7000
0.05	0.6	4.5	30	150	900	7500
0.06	0.65	5	35	200	950	8000
0.07	0.7	5.5	40	250	1000	8500
0.08	0.75	6	45	300	1500	9000
0.09	0.8	6.5	50	350	2000	9500
0.1	0.85	7	55	400	2500	10000
0.15	0.9	7.5	60	450	3000	
0.2	0.95	8	65	500	3500	
0.25	1	8.5	70	550	4000	
0.3	1.5	9	75	600	4500	

3) Identify the basic assumptions used to generate a bounding heat load:

- 3.1) 87,000 Ci of Cs (approximately 1 kg Cs) is used as a spike material per SRP pour canister. (See assumption 4.3.4 and Ref. 5.21)
- 3.2) All of the Cs is Cs-137 with a 30 year half life. (See assumption 4.3.6)
- 3.3) All of the Cs-137 decay energy, including gamma radiation, etc. with the exception of beta decay neutrino (minus 65% of decay) is captured in the glass matrix (See assumption 4.3.7)
- 3.4) The mass of Pu emplaced in the glass is equal to 5% of the mass of glass. (see assumption 4.3.4 and Ref. 5.21)
- 3.5) The Pu is composed of the following isotopes: Pu-238, Pu-239, Pu-240, Pu-241, and Am-241 with the following wt% respectively: 0.05%, 93.3%, 5.9%, 0.35%, and 0.4%. (See assumption 4.3.4 and Ref. 5.21)
- 3.6) All glass is emplaced in the repository with an insignificant aging time (i.e., at time of manufacture of glass the pour canister is quickly emplaced in the MGDS) (See assumption 4.3.8)

Create MATHCAD variables for this information:

j = index indicating the Pu isotope as follows:

j=1 for Pu-238 data

j=2 for Pu-239 data

j=3 for Pu-240 data

j=4 for Pu-241 data

j=5 for Am-241 data

PuI = weight percent of total Pu which is each j-th isotope

PuG = weight percent of glass which is Pu

CuriesCs = Curies of Cs-137 mixed into the glass

j := 1..5

PuG := 0.05

PuI_j :=

CuriesCs := 87000.

0.0005
0.933
0.059
0.0035
0.004

Check weight percents to ensure 100% is accounted for:

$$\sum_{n=1}^5 \text{PuI}_n = 1$$

4) Identify the basic data required for each isotope:

4.1) Reference 5.1, page 399 provides the following data for Cs-137:

Cs-137 Decays by Beta to Ba-137 which by two possible modes:

- 1) Beta decay directly to ground state Ba-137; Beta MeV: 1.176 (6.5%)
- 2) Beta decay to excited state Ba-137 which then emits a gamma via an IT transition to get to ground state; Beta MeV: 0.514 (93.5%) then Ba-137 gamma MeV: 0.6616

Assuming all energy deposited in the glass; then each decay provides 1.176 MeV, however, we also now assume that 65% of the energy is carried off by the neutrino. Now define the MATHCAD variables:

Cshfl = Cs-137 half life in years

CsMeV = Cs-137 decay energy in MeV

$$\text{Cshfl} := 30$$

$$\text{CsMeV} := (0.35 \cdot 0.514) + 0.662$$

4.2) Reference 5.8, pp. 976 and 977 provided the following data for each Pu isotope specified in 3.5 above.

Puhfl = Half life of the j-th isotope in years (see part 3 above)

Puamu = Atomic mass of the j-th isotope in atomic mass units (amu)

Pumev = Decay energy of the j-th isotope in MeV. (All decay by alpha particle emission)

Puhfl_j :=

86
24400
6580
13.2
458

Puamu_j :=

238.0495
239.0522
240.0539
241.0567
241.0567

Pumev_j :=

5.592
5.243
5.255
0.007
5.640

5) Define required conversion, math, or physical constants:

$$Ci := 3.7 \cdot 10^{10} \quad /second \quad (\# \text{ decays per second; see Ref. 5.1, page 420})$$

$$JperMeV := 1.60210 \cdot 10^{-13} \quad (\text{Joules / MeV conversion; Ref. 5.8, page 935})$$

$$N := 6.022045 \cdot 10^{23} \quad /(g \text{ mole}) \quad (\text{Avogadro's number; Ref. 5.8, page 933})$$

6) Define mathematical functions for repetitious calculations:

6.1) Radioactive decay is governed by the function (Ref. 5.8, p. 28):

A = Initial amount of material decaying.

L = Decay constant of material decaying ($L = \ln(2)/\text{Half Life}$).

T = Time over which the material has decayed.

$$D(A, L, T) := A \cdot e^{-L \cdot T}$$

6.2) Convert half life (i.e., X) in years to a decay constant in "/years":

$$Lampy(X) := \frac{\ln(2.0)}{X}$$

6.3) Convert half life (i.e., X) in years to a decay constant in "/seconds":

$$Lamps(X) := \left(\frac{1.0}{365 \cdot 24 \cdot 60 \cdot 60} \right) \cdot \frac{\ln(2.0)}{X}$$

6.4) Convert mass of material to number of atoms of the material (p. 28, Ref. 5.8):

W = mass of material in grams.

A = mass of one mole of material in grams (= to amu's).

N = Avogadro's Constant.

$$\text{Num}(A, W) := N \cdot \frac{W}{A}$$

6.5) Calculate the activity of the material in Curies (p. 28, Ref. 5.8):

L = Decay constant of material in units of "/second".

NA = Number of atoms of material.

Ci = Conversion of decays/second to Curies.

$$Ci(L, NA) := L \cdot \frac{NA}{Ci}$$

6.6) Convert the heat generation of decay of the material into Watts:

C = Activity of material in Curies.

E = Energy of decay in MeV for the material.

Ci = Conversion of decays/second to Curies.

JperMeV = Units conversion constant for MeV to Joules

$$Watts(C, E) := C \cdot Ci \cdot E \cdot JperMeV$$

7) Determine the mass and number of atoms of each constituent isotope of Pu in grams.
Assumption 4.3.4 and Ref. 5.21 set the mass of the greenfield glass as 1680 kg.

New MATHCAD Variables: Wtglass = mass of glass in kg

gmsPu = Total mass of Pu in grams

Pugms = Mass of each isotope of Pu in grams

PuNum = Number of atoms of each isotope of Pu

$$Wtglass := 1680$$

$$gmsPu := PuG \cdot Wtglass \cdot 1000.0$$

$$gmsPu = 84000$$

$$Pugms_j := PuI_j \cdot gmsPu$$

$$PuNum_j := Num(Puamu_j, Pugms_j)$$

Remember:

j=1 Pu-238:

j=2 Pu-239:

j=3 Pu-240:

j=4 Pu-241:

j=5 Am-241:

Pugms_j

42
78372
4956
294
336

PuNum_j

$1.06249284 \cdot 10^{23}$
$1.97429562 \cdot 10^{26}$
$1.24327307 \cdot 10^{25}$
$7.34466717 \cdot 10^{23}$
$8.39390533 \cdot 10^{23}$

8) Determine the decay constants in "/second" and "/year" and the curies of each constituent isotope of Pu and for Cs-137.

New MATHCAD Variables: Pu_{lam} = Decay constant of each Pu isotope in "/s".
 PuL = Decay constant of each Pu isotope in "/year".
 Cs_{lam} = Decay constant of Cs-137 in "/s".
 CsL = Decay constant of Cs-137 in "/year".
 $PuCi$ = Curies of each Pu isotope.

$$Pu_{lam_j} := Lamps(Puhfl_j)$$

Pu_{lam_j}

$2.55576197 \cdot 10^{-10}$
$9.00801349 \cdot 10^{-13}$
$3.34035759 \cdot 10^{-12}$
$1.66511764 \cdot 10^{-9}$
$4.79902902 \cdot 10^{-11}$

$$PuL_j := Lampy(Puhfl_j)$$

PuL_j

0.00805985
0.00002841
0.00010534
0.05251115
0.00151342

$$Cs_{lam} := Lamps(Cshfl)$$

$$Cs_{lam} = 7.32651764 \cdot 10^{-10}$$

$$CsL := Lampy(Cshfl)$$

$$CsL = 0.02310491$$

$$PuCi_j := Ci(Pu_{lam_j}, PuNum_j)$$

$PuCi_j$

733.91318844
4806.61663463
1122.42611982
33053.33755375
1088.71879154

$$CuriesCs = 87000$$

9) Determine the initial heat in Watts for each constituent isotope of Pu and for Cs-137.

New MATHCAD Variables: PuWatts = Heat in Watts generated by each Pu isotope.

CsWatts = Heat in Watts generated by Cs-137.

$$\text{PuWatts}_j := \text{Watts}(\text{PuCi}_j, \text{PumeV}_j)$$

$$\text{CsWatts} := \text{Watts}(\text{CuriesCs}, \text{CsMeV})$$

$$\text{PuWatts}_j$$

$$\text{CsWatts} = 434.18129198$$

24.32782031
149.38627129
34.96405779
1.37152808
36.39872469

10) Decay the curies and watts of each isotope for the time steps desired for the ANSYS input heat load file and then calculate the total watts and curies for a pour cansiter:

Heat in Watts versus time:

Curies versus time:

$$\text{HGCs}_i := D(\text{CsWatts}, \text{CsL}, T_i)$$

$$\text{CiCs}_i := D(\text{CuriesCs}, \text{CsL}, T_i)$$

$$\text{Pu238HG}_i := D(\text{PuWatts}_1, \text{PuL}_1, T_i)$$

$$\text{Pu238Ci}_i := D(\text{PuCi}_1, \text{PuL}_1, T_i)$$

$$\text{Pu239HG}_i := D(\text{PuWatts}_2, \text{PuL}_2, T_i)$$

$$\text{Pu239Ci}_i := D(\text{PuCi}_2, \text{PuL}_2, T_i)$$

$$\text{Pu240HG}_i := D(\text{PuWatts}_3, \text{PuL}_3, T_i)$$

$$\text{Pu240Ci}_i := D(\text{PuCi}_3, \text{PuL}_3, T_i)$$

$$\text{Pu241HG}_i := D(\text{PuWatts}_4, \text{PuL}_4, T_i)$$

$$\text{Pu241Ci}_i := D(\text{PuCi}_4, \text{PuL}_4, T_i)$$

$$\text{Am241HG}_i := D(\text{PuWatts}_5, \text{PuL}_5, T_i)$$

$$\text{Am241Ci}_i := D(\text{PuCi}_5, \text{PuL}_5, T_i)$$

$$\text{HGtot}_i := \text{HGCs}_i + \text{Pu238HG}_i + \text{Pu239HG}_i + \text{Pu240HG}_i + \text{Pu241HG}_i + \text{Am241HG}_i$$

$$\text{Citot}_i := \text{CiCs}_i + \text{Pu238Ci}_i + \text{Pu239Ci}_i + \text{Pu240Ci}_i + \text{Pu241Ci}_i + \text{Am241Ci}_i$$

11) Echo the individual isotope and total heat load values in watts for ANSYS times of initial emplacement (0.000001 years), 10 years, and 1000 years for quick check purposes:

$T_1 = 1 \cdot 10^{-6}$	$T_{47} = 10$	$T_{83} = 1000$
HGCs ₁ = 434.18128195	HGCs ₄₇ = 344.60991982	HGCs ₈₃ = $4.01178747 \cdot 10^{-8}$
Pu238HG ₁ = 24.32782011	Pu238HG ₄₇ = 22.44397165	Pu238HG ₈₃ = 0.00768696
Pu239HG ₁ = 149.38627128	Pu239HG ₄₇ = 149.34384015	Pu239HG ₈₃ = 145.20226549
Pu240HG ₁ = 34.96405779	Pu240HG ₄₇ = 34.92724551	Pu240HG ₈₃ = 31.46824987
Pu241HG ₁ = 1.37152801	Pu241HG ₄₇ = 0.81124433	Pu241HG ₈₃ = 0
Am241HG ₁ = 36.39872464	Am241HG ₄₇ = 35.85200598	Am241HG ₈₃ = 8.01337441
HGtot ₁ = 680.62968377	HGtot ₄₇ = 587.98822744	HGtot ₈₃ = 184.69157676

12) Echo the individual isotope and total activity values in curies for ANSYS times of initial emplacement (0.000001 years), 10 years, and 1000 years for quick check purposes:

$T_1 = 1 \cdot 10^{-6}$	$T_{47} = 10$	$T_{83} = 1000$
CiCs ₁ = 86999.99798987	CiCs ₄₇ = 69051.94576062	CiCs ₈₃ = 0.00000804
Pu238Ci ₁ = 733.91318252	Pu238Ci ₄₇ = 677.08189992	Pu238Ci ₈₃ = 0.23189741
Pu239Ci ₁ = 4806.61663449	Pu239Ci ₄₇ = 4805.2513807	Pu239Ci ₈₃ = 4671.99307325
Pu240HG ₁ = 34.96405779	Pu240HG ₄₇ = 34.92724551	Pu240HG ₈₃ = 31.46824987
Pu241Ci ₁ = 33053.33581808	Pu241Ci ₄₇ = 19550.69910737	Pu241Ci ₈₃ = 0
Am241Ci ₁ = 1088.71878989	Am241Ci ₄₇ = 1072.36594003	Am241Ci ₈₃ = 239.68727951
Citot ₁ = 127805.00853456	Citot ₄₇ = 96278.58845031	Citot ₈₃ = 5922.11495856

- 13) Create a matrix of all of the heat load data calculate and save to a MATHCAD print file for translation of the total heat load data into an ANSYS heat load input file:

$A^{<1>} := T$ $A^{<2>} := HG_{tot}$ $A^{<3>} := HGCs$ $A^{<4>} := Pu238HG$
 $A^{<5>} := Pu239HG$ $A^{<6>} := Pu240HG$ $A^{<7>} := Pu241HG$ $A^{<8>} := Am241HG$

$WRITEPRN(PUGLSHG1) := A$

1e-006	680.63	434.18	24.328	149.39	34.964	1.3715	36.399
0.01	680.53	434.08	24.326	149.39	34.964	1.3708	36.398
0.02	680.42	433.98	24.324	149.39	34.964	1.3701	36.398
0.03	680.32	433.88	24.322	149.39	34.964	1.3694	36.397
0.04	680.22	433.78	24.32	149.39	34.964	1.3687	36.397
0.05	680.11	433.68	24.318	149.39	34.964	1.3679	36.396
0.06	680.01	433.58	24.316	149.39	34.964	1.3672	36.395
0.07	679.9	433.48	24.314	149.39	34.964	1.3665	36.395
0.08	679.8	433.38	24.312	149.39	34.964	1.3658	36.394
0.09	679.7	433.28	24.31	149.39	34.964	1.3651	36.394
0.1	679.59	433.18	24.308	149.39	34.964	1.3643	36.393
0.15	679.08	432.68	24.298	149.39	34.964	1.3608	36.39
0.2	678.56	432.18	24.289	149.39	34.963	1.3572	36.388
0.25	678.05	431.68	24.279	149.39	34.963	1.3536	36.385
0.3	677.53	431.18	24.269	149.38	34.963	1.3501	36.382
0.35	677.02	430.68	24.259	149.38	34.963	1.3466	36.379
0.4	676.5	430.19	24.25	149.38	34.963	1.343	36.377
0.45	675.99	429.69	24.24	149.38	34.962	1.3395	36.374
0.5	675.48	429.19	24.23	149.38	34.962	1.336	36.371
0.55	674.97	428.7	24.22	149.38	34.962	1.3325	36.368
0.6	674.45	428.2	24.21	149.38	34.962	1.329	36.366
0.65	673.94	427.71	24.201	149.38	34.962	1.3255	36.363
0.7	673.43	427.22	24.191	149.38	34.961	1.322	36.36
0.75	672.92	426.72	24.181	149.38	34.961	1.3186	36.357
0.8	672.41	426.23	24.171	149.38	34.961	1.3151	36.355
0.85	671.91	425.74	24.162	149.38	34.961	1.3117	36.352
0.9	671.4	425.25	24.152	149.38	34.961	1.3082	36.349
0.95	670.89	424.75	24.142	149.38	34.961	1.3048	36.346
1	670.38	424.26	24.133	149.38	34.96	1.3014	36.344
1.5	665.35	419.39	24.035	149.38	34.959	1.2676	36.316
2	660.37	414.57	23.939	149.38	34.957	1.2348	36.289
2.5	655.45	409.81	23.843	149.38	34.955	1.2028	36.261
3	650.58	405.11	23.747	149.37	34.953	1.1716	36.234
3.5	645.77	400.45	23.651	149.37	34.951	1.1413	36.206
4	641.02	395.85	23.556	149.37	34.949	1.1117	36.179
4.5	636.32	391.31	23.461	149.37	34.947	1.0829	36.152
5	631.67	386.81	23.367	149.37	34.946	1.0548	36.124
5.5	627.07	382.37	23.273	149.36	34.944	1.0275	36.097
6	622.53	377.98	23.179	149.36	34.942	1.0009	36.07
6.5	618.04	373.64	23.086	149.36	34.94	0.97492	36.042
7	613.6	369.34	22.993	149.36	34.938	0.94966	36.015
7.5	609.21	365.1	22.901	149.35	34.936	0.92505	35.988
8	604.87	360.91	22.809	149.35	34.935	0.90108	35.961
8.5	600.57	356.76	22.717	149.35	34.933	0.87773	35.933
9	596.33	352.66	22.626	149.35	34.931	0.85498	35.906
9.5	592.14	348.61	22.535	149.35	34.929	0.83283	35.879
10	587.99	344.61	22.444	149.34	34.927	0.81124	35.852
15	549.01	307.01	21.557	149.32	34.909	0.62391	35.582
20	514.21	273.52	20.706	149.3	34.89	0.47984	35.313
25	483.13	243.68	19.888	149.28	34.872	0.36904	35.047
30	455.37	217.09	19.103	149.26	34.854	0.28382	34.783
35	430.57	193.41	18.348	149.24	34.835	0.21828	34.521
40	408.39	172.3	17.623	149.22	34.817	0.16788	34.261
45	388.56	153.51	16.927	149.2	34.799	0.12911	34.002
50	370.82	136.76	16.259	149.17	34.78	0.099298	33.746
55	354.94	121.84	15.617	149.15	34.762	0.076368	33.492
60	340.72	108.55	15	149.13	34.744	0.058734	33.239
65	327.98	96.703	14.407	149.11	34.725	0.045171	32.989
70	316.56	86.152	13.838	149.09	34.707	0.03474	32.74
75	306.32	76.753	13.292	149.07	34.689	0.026718	32.493
80	297.13	68.379	12.767	149.05	34.671	0.020549	32.248
85	288.88	60.919	12.262	149.03	34.652	0.015804	32.005
90	281.47	54.273	11.778	149	34.634	0.012154	31.764
95	274.8	48.351	11.313	148.98	34.616	0.0093476	31.524
100	268.8	43.076	10.866	148.96	34.598	0.0071891	31.287
150	233	13.568	7.2619	148.75	34.416	0.00052049	29.007
200	218.79	4.2737	4.8533	148.54	34.235	3.7683e-005	26.893
250	211.91	1.3461	3.2435	148.33	34.055	2.7282e-006	24.933
300	207.7	0.42401	2.1677	148.12	33.876	1.9752e-007	23.116
350	204.62	0.13355	1.4487	147.91	33.698	1.43e-008	21.431

400	202.1	0.042067	0.9682	147.7	33.521	1.0353e-009	19.869
450	199.92	0.01325	0.64706	147.49	33.345	7.4958e-011	18.421
500	197.96	0.0041735	0.43244	147.28	33.17	5.4269e-012	17.079
550	196.19	0.0013146	0.28901	147.07	32.996	3.9291e-013	15.834
600	194.56	0.00041407	0.19315	146.86	32.823	2.8446e-014	14.68
650	193.04	0.00013042	0.12909	146.65	32.65	2.0595e-015	13.61
700	191.63	4.1081e-005	0.08627	146.45	32.479	1.4911e-016	12.618
750	190.3	1.294e-005	0.057656	146.24	32.308	1.0795e-017	11.699
800	189.05	4.0757e-006	0.038532	146.03	32.138	7.8156e-019	10.846
850	187.87	1.2838e-006	0.025752	145.82	31.969	5.6584e-020	10.056
900	186.76	4.0436e-007	0.01721	145.62	31.801	4.0967e-021	9.3227
950	185.7	1.2737e-007	0.011502	145.41	31.634	2.966e-022	8.6433
1000	184.69	4.0118e-008	0.007687	145.2	31.468	2.1473e-023	8.0134
1500	176.77	3.8563e-013	0.00013664	143.15	29.854	8.4967e-035	3.7599
2000	171.22	3.7068e-018	2.4289e-006	141.14	28.322	3.362e-046	1.7642
2500	166.84	3.5632e-023	4.3175e-008	139.14	26.869	1.3303e-057	0.82777
3000	163.06	3.4251e-028	7.6746e-010	137.18	25.49	5.2638e-069	0.3884
3500	159.61	3.2923e-033	1.3642e-011	135.25	24.182	2.0828e-080	0.18224
4000	156.37	3.1647e-038	2.425e-013	133.34	22.942	8.2413e-092	0.085507
4500	153.26	3.0421e-043	4.3106e-015	131.46	21.765	3.2609e-103	0.040121
5000	150.27	2.9242e-048	7.6623e-017	129.61	20.648	1.2903e-114	0.018825
5500	147.38	2.8109e-053	1.362e-018	127.78	19.588	5.1055e-126	0.0088328
6000	144.56	2.7019e-058	2.4211e-020	125.98	18.583	2.0202e-137	0.0041444
6500	141.83	2.5972e-063	4.3036e-022	124.2	17.63	7.9935e-149	0.0019446
7000	139.17	2.4965e-068	7.65e-024	122.45	16.725	3.1629e-160	0.00091241
7500	136.59	2.3998e-073	1.3598e-025	120.72	15.867	1.2515e-171	0.00042811
8000	134.07	2.3068e-078	2.4172e-027	119.02	15.053	4.952e-183	0.00020087
8500	131.62	2.2174e-083	4.2967e-029	117.34	14.281	1.9594e-194	9.4251e-005
9000	129.23	2.1314e-088	7.6377e-031	115.68	13.548	7.7532e-206	4.4223e-005
9500	126.91	2.0488e-093	1.3577e-032	114.05	12.853	3.0678e-217	2.075e-005
10000	124.64	1.9694e-098	2.4133e-034	112.44	12.194	1.2139e-228	9.736e-006

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/COM, **
/COM, ** Executable File Name: MATHCAD.EXE **
/COM, ** Output File Name: pusgls3.dat **
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/COM, ** Enrichment (kg Pu): N.A. **
/COM, ** Burnup (MWD/MTHM): N.A. **
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/COM, ** ASSY(#,0) is the time post emplacement in years. **
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ASSY(55,0)= 50.00, 55.00, 60.00, 65.00, 70.00, 75.00,
ASSY(61,0)= 80.00, 85.00, 90.00, 95.00, 100.00, 150.00,
ASSY(67,0)= 200.00, 250.00, 300.00, 350.00, 400.00, 450.00,
ASSY(73,0)= 500.00, 550.00, 600.00, 650.00, 700.00, 750.00,
ASSY(79,0)= 800.00, 850.00, 900.00, 950.00, 1000.00, 1500.00,
ASSY(85,0)= 2000.00, 2500.00, 3000.00, 3500.00, 4000.00, 4500.00,
ASSY(91,0)= 5000.00, 5500.00, 6000.00, 6500.00, 7000.00, 7500.00,
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/COM, **      Compiled by T. Lotz on 4-17-95                  **
/COM, *****
/COM,
/COM, NUMBER MATERIAL DESCRIPTION
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/COM, 2 Incaloy 825 Inner Container (resistant)
/COM, 3 A516 Mild Steel Outer Container (allowance)
/COM, 4 Concrete Concrete used for invert; Track Bed
/COM, 5 Glass (Pyrex) Boro-Silicate Glass form
/COM, 6 TSW2 Drift Wall - Repository Horizon
/COM, 7 Helium Canister Fill Gas
/COM, 8 Air Alternate Fill Gas
/COM, 9 Nitrogen Alternate Fill Gas
/COM, 10 Argon Alternate Fill Gas
/COM, 11 Aluminum 6063 Thermal Conductor
/COM, 12 Copper Alternate Thermal Conductor
/COM, 13 Aluminum-Boron Aluminum Boron Criticality Matl
/COM,
/COM, *****
/COM, **      Density: DENS (kg/m^3) **
/COM, **      Emissivity EMIS **
/COM, **      Conductivity: KXX (W/m/K) **
/COM, **      Specific Heat: C (J/kg/K) **
/COM, *****
/COM,
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/COM, Density of rock (6) is 1.0 because
/COM, heat capacitances (J/m^3/K) are entered for C
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MPDATA,DENS, 4, 1, .23000E+04,
MPDATA,DENS, 5, 1, .22250E+04,
MPDATA,DENS, 6, 1, 1.0,
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MPDATA,DENS,12, 1, .89330E+04,
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MPTEMP, 13, 343.33, 371.11, 398.89, 426.67, 454.44, 482.22,
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MPTEMP, 25, 676.67, 704.44, 732.22, 760.00, 787.78, 815.56,
MPDATA, KXX, 1, 1, 13.33, 13.67, 14.19, 14.54, 15.06, 15.58,
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MPDATA, KXX, 1, 25, 23.54, 23.88, 24.23, 24.58, 24.92, 25.27,
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MPDATA, C, 1, 19, 565.01, 564.91, 572.35, 572.14, 574.92, 574.68,
MPDATA, C, 1, 25, 581.64, 581.30, 583.86, 586.36, 585.96, 588.39,
MPDATA, KXX, 3, 1, 40.84, 41.36, 41.88, 42.23, 42.23, 42.23,
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MPDATA, KXX, 3, 13, 39.29, 38.77, 38.08, 37.56, 36.69, 36.17,
MPDATA, KXX, 3, 19, 35.48, 34.61, 33.92, 33.23, 32.36, 31.50,
MPDATA, KXX, 3, 25, 30.29, 28.90, 27.35, 26.48, 26.13, 26.13,
MPDATA, C, 3, 1, 428.72, 444.95, 460.94, 476.87, 486.08, 495.66,
MPDATA, C, 3, 7, 506.09, 517.07, 525.64, 536.99, 543.63, 550.62,
MPDATA, C, 3, 13, 562.21, 577.32, 589.10, 600.57, 611.35, 629.09,
MPDATA, C, 3, 19, 645.32, 665.12, 682.07, 694.52, 724.07, 761.95,
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Define K for material 2

MPTEMP

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MPTEMP, 13, 426.67, 454.44, 482.22, 510.00, 537.78, 565.56,
MPTEMP, 19, 593.33, 621.11, 648.89, 676.67, 704.44, 732.22,
MPTEMP, 25, 760.00, 787.78, 815.56,
MPDATA, KXX, 2, 1, 12.29, 12.63, 13.15, 13.67, 14.02, 14.54,
MPDATA, KXX, 2, 7, 14.88, 15.40, 15.75, 16.10, 16.61, 16.96,
MPDATA, KXX, 2, 13, 17.31, 17.65, 18.00, 18.52, 18.86, 19.21,
MPDATA, KXX, 2, 19, 19.73, 20.08, 20.42, 20.94, 21.46, 21.98,
MPDATA, KXX, 2, 25, 22.33, 23.02, 23.54,

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/COM,

/COM,

Define C for material 2

MPTEMP

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MPTEMP, 1, 93.33, 121.11, 148.89, 176.67, 204.44, 232.22,
MPTEMP, 7, 260.00, 287.78, 315.56, 343.33, 371.11, 398.89,
MPTEMP, 13, 426.67, 454.44, 482.22, 510.00, 537.78,
MPDATA, C, 2, 1, 460.69, 477.42, 501.02, 504.65, 498.12, 520.45,
MPDATA, C, 2, 7, 536.88, 559.85, 576.83, 576.21, 581.68, 598.20,
MPDATA, C, 2, 13, 619.58, 636.76, 654.20, 678.25, 696.29,

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/COM,

/COM,

Define C for material 6

MPTEMP

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MPTEMP, 9, 195.0, 235.0, 275.0,
MPDATA, C, 6, 1, 2.03240E+06, 2.12800E+06, 2.26380E+06, 1.07638E+07,
MPDATA, C, 6, 5, 1.04690E+07, 1.01984E+07, 2.00650E+06, 2.11140E+06,
MPDATA, C, 6, 9, 2.19120E+06, 2.26920E+06, 2.34100E+06,

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/COM,

/COM,

Define p, K, C for materials 7, 8, 9, ~10

MPTEMP

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MPTEMP, 13, 526.85, 626.85, 726.85,
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MPDATA, DENS, 7, 7, 0.0975, 0.0906, 0.0836, 0.0767, 0.0697, 0.0662,
MPDATA, DENS, 7, 13, 0.0627, 0.0558, 0.0488,
MPDATA, KXX, 7, 1, 0.1370, 0.1450, 0.1520, 0.1700, 0.1870, 0.2040,
MPDATA, KXX, 7, 7, 0.2200, 0.2360, 0.2520, 0.2640, 0.2780, 0.2910,
MPDATA, KXX, 7, 13, 0.3040, 0.3300, 0.3540,
MPDATA, DENS, 8, 1, 1.3480, 1.2547, 1.1614, 0.9950, 0.8711, 0.7740,
MPDATA, DENS, 8, 7, 0.6964, 0.6329, 0.5804, 0.5356, 0.4975, 0.4643,
MPDATA, DENS, 8, 13, 0.4354, 0.3868, 0.3482,
MPDATA, KXX, 8, 1, 0.0230, 0.0250, 0.0260, 0.0300, 0.0340, 0.0370,

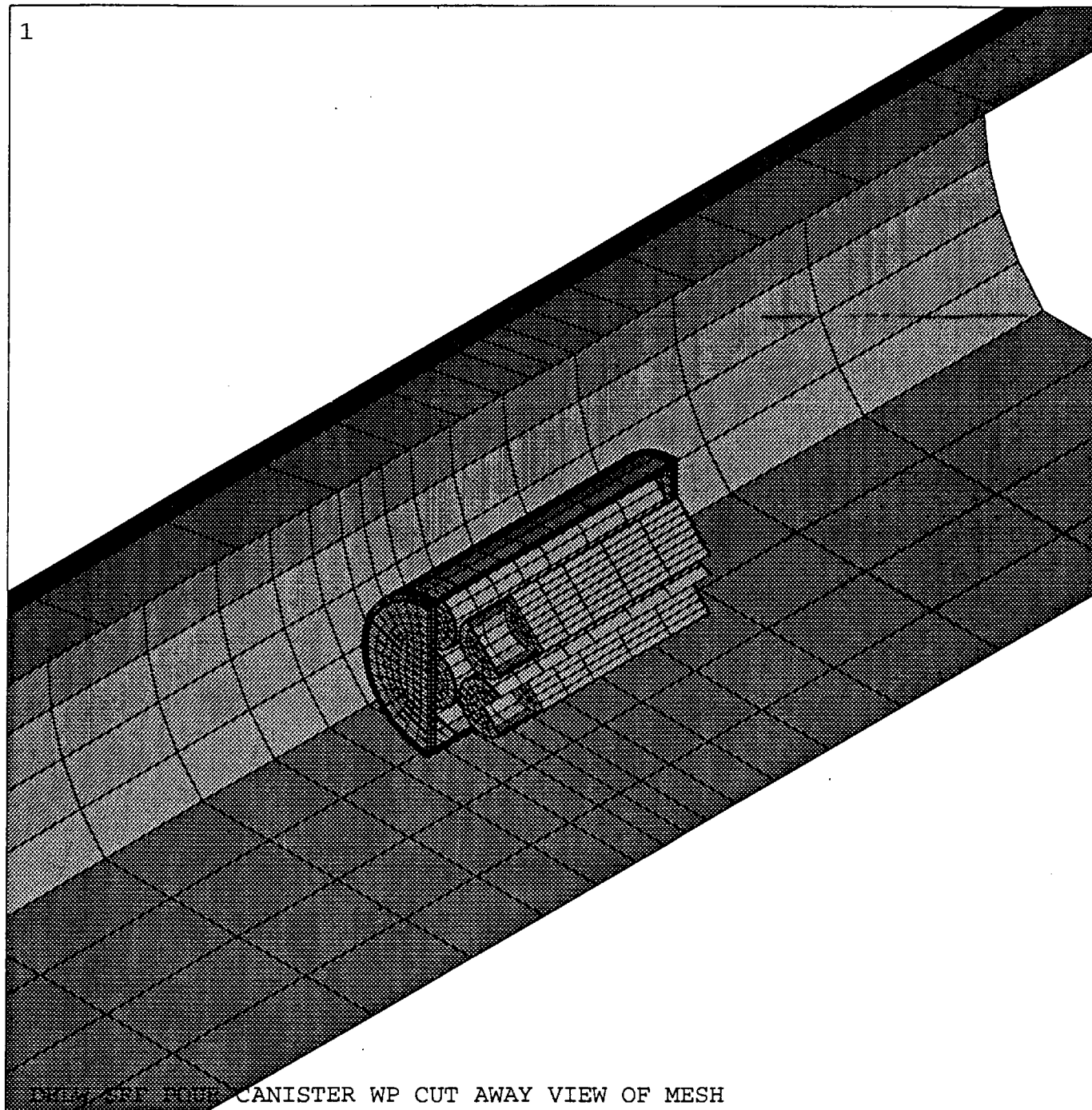
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MPDATA, DENS, 9, 13, 0.4211, 0.3743, 0.3368,
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MPDATA, C, 9, 7, 1056.0, 1065.0, 1075.0, 1086.5, 1098.0, 1159.0,
MPDATA, C, 9, 13, 1220.0, 1146.0, 1167.0,
MPDATA, KXX, 10, 1, 0.0170, 0.0170, 0.0180, 0.0210, 0.0230, 0.0250,
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MPDATA, C, 12, 1, 356.0, 385.0, 397.0, 417.0, 433.0, 451.0,
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MPDATA, KXX, 13, 1, 182.56, 190.17, 199.22, 202.91, 203.72,
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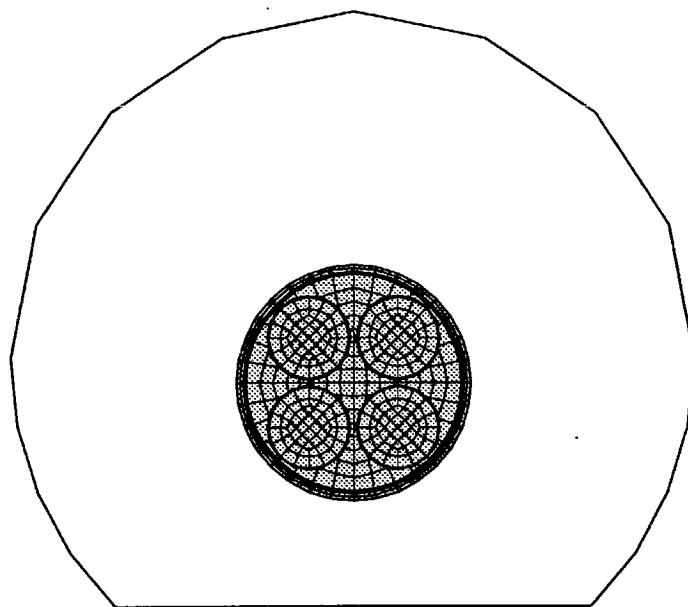


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OCT 27 1995
20:00:23
PLOT NO. 1
ELEMENTS
MAT NUM

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YV =1
ZV =1
*DIST=5
YF =.5333
PRECISE HIDDEN

DELETED FOUR CANISTER WP CUT AWAY VIEW OF MESH

1



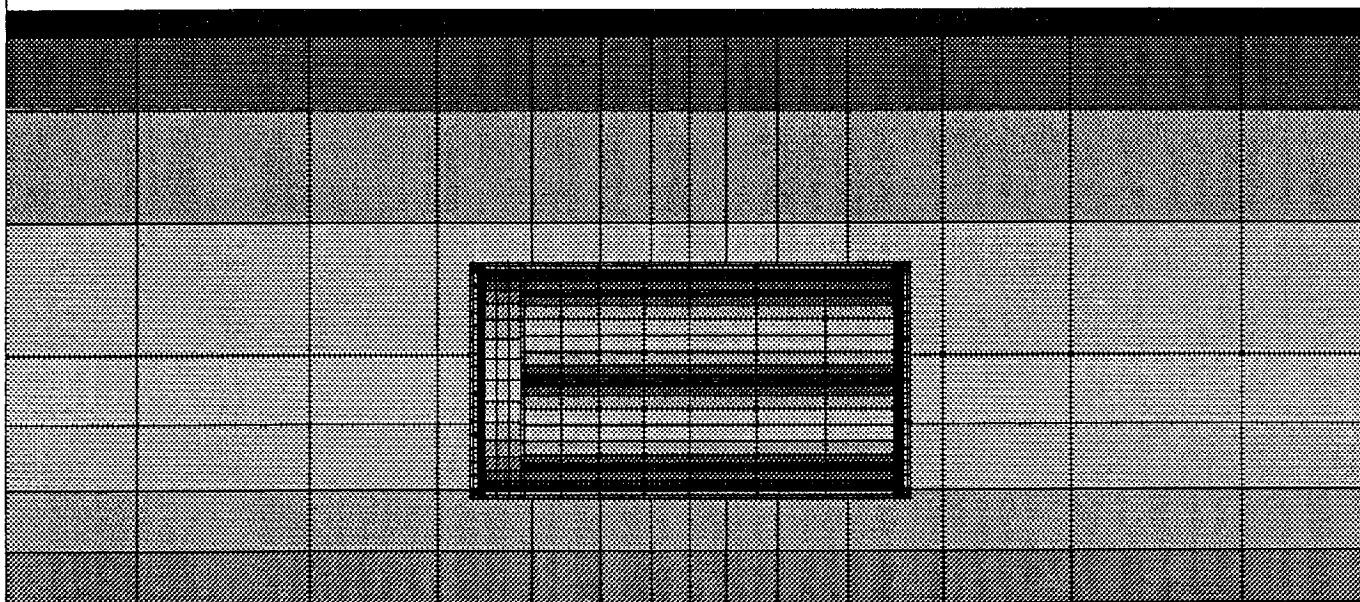
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OCT 27 1995
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MAT NUM

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PRECISE HIDDEN

1

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OCT 27 1995
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PLOT NO. 1
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YF =.5333
PRECISE HIDDEN



DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

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*SET,YYY , -1.663000000000
/GOPR

```

WELCOME TO THE ANSYS PROGRAM

***** ANSYS COMMAND LINE ARGUMENTS *****
JOB NAME = glsp21x2
MEMORY REQUESTED (MB) = 87.0
BATCH MODE REQUESTED
start.ans FILE

***** ANSYS DYNAMIC MEMORY ALLOCATION *****
WORK SPACE REQUESTED = 22806528 87.000 MB COMMAND LINE
MINIMUM WORK SPACE REQUIRED = 4718592 18.000 MB
MINIMUM WORK SPACE RECOMMENDED = 6702496 25.568 MB
WORK SPACE OBTAINED = 22806526 87.000 MB
BYTES PER WORD = 4

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USERS MUST VERIFY THEIR OWN RESULTS.

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ERRORS ENCOUNTERED IN EITHER THE DOCUMENTATION OR THE
RESULTS SHOULD BE IMMEDIATELY BROUGHT TO OUR ATTENTION.

ENTER /SHOW,device TO SET THE GRAPHICS DISPLAY TO device(e.g. X11,4207,ETC.)
ENTER /MENU,ON TO START THE ANSYS MENU SYSTEM
ENTER HELP FOR GENERAL ANSYS HELP INFORMATION
1 /COM, *****
2 /COM, ANSYS REVISION 5.0A 05/23/1995
3 /COM, 3-D Model of Pu Disp. Glass WP for MGDS Disposal Thomas L Lotz
4 /COM, *****
5 /COM, *
6 /COM, * File name: glsp21x2.inp
7 /COM, * 4 Pack Glass WP Form w/ C71500 Outer Barrier D. Container *
8 /COM, * No Helium Fill Gas - WP placed at mid point between SNF WP *
9 /COM, *
10 /COM, * Material Property file: propsd1.dat
11 /COM, *
12 /COM, * SNF Conductivity file: TBD (NOT REQUIRED)
13 /COM, *
14 /COM, *
15 /COM, * SNF Heat Loads file: pusgls2.dat
16 /COM, * Initial Heat Load: 853 W/canister
17 /COM, *
18 /COM, * Surface Temp. file: c21x5a.parm *

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19 /COM, *      100 MTU/acre (24.7 kgU/m^2) AML (High Thermal Loading) *
20 /COM, *      5.0 m Diameter Drift with Concrete Invert *
21 /COM, *      Drift spacing = 22.5 m *
22 /COM, *      WP c/c spacing = 16.165 m *
23 /COM, *
24 /COM, *****
25 /COM, Increase the number of database pages from 16 (256) to 32 Mb
26 /COM, DONT DO: /CONFIG,nvpag,512,
27 /COM, Work space must also be increased (-m 87) For Radiation Matix
28 /COM, *****
29 /TITLE, DHLW Glass Form Waste Package
30 /UNITS,SI,
31 /COM,
32 /COM, *****
33 /COM, Read in average effective conductivities from SNF model
34 /COM, No Need for File: PARRES,CHANGE,pwr15e,param,
35 /COM, Read in surface temps. from repository model
36 PARRES,CHANGE,c21x5a,param,
37 /COM, *****
38 /COM, Define Transient time parameters (AS PER THE PARAM FILE)
39 /COM, TM_START = start time (sec)
40 /COM, TMI* = time increment for solution (sec)
41 /COM, TME* = start and stop for time do-loops (sec)
42 /COM, Note: 1 year = 3.15576e7 seconds
43 /COM, TMTMAX = time of maximum cladding temperature
44 /COM, TM_START=(1.0E-6)*(3.15576E7)
45 /COM, TMI0=0.1*3.15576E7
46 /COM, TMI1=1.0*3.15576E7
47 /COM, TMI10=10.0*3.15576E7
48 /COM, TMI100=100.0*3.15576E7
49 /COM, TMI1000=1000.0*3.15576E7
50 /COM, TME0=0.9*3.15576E7+TM_START
51 /COM, TME1=TMI1+TM_START
52 /COM, TME9=9.0*3.15576E7+TM_START
53 /COM, TME10=TMI10+TM_START
54 /COM, TME50=50.0*3.15576E7+TM_START
55 /COM, TME90=90.0*3.15576E7+TM_START
56 /COM, TME100=TMI100+TM_START
57 /COM, TME1000=TMI1000+TM_START
58 /COM, *****
59 /COM, Define waste package parameters
60 /COM,
61 /COM, Required Constants:
62 /COM,
63 PI=3.141592654
64 SQT= SQRT(2.0)
65 /COM, Define emplacement parameters
66 /COM, DFRAD = radius of drift (m)
67 /COM, INVRT = height of invert backfill floor (m)
68 /COM, WPSPC = waste package c/c spacing (m)
69 /COM, OFFST = WP center below drift center (m)
70 /COM, XXX = X coordinate of invert drift wall intersection
71 /COM, YYY = Y coordinate of invert drift wall intersection
72 *SET,DFRAD,2.5,
73 *SET,INVRT,0.7,
74 *SET,WPSPC,16.165,
75 *SET,OFFST,0.1833,
76 XXX=SQRT(DFRAD**2-(DFRAD-INVRT)**2)
77 YYY=OFFST-DFRAD+INVRT
78 /COM,
79 /COM, Required container wall parameters:
80 /COM, DCIRD = disposal container inner radius (m)
81 /COM, OWALL = outer barrier thickness (m)
82 /COM, IWALL = inner barrier thickness (m)
83 /COM, DCORD = disposal container outer radius (m)
84 /COM, DCLEN = Disp. Cont. outside length
85 /COM, DCOLI = Disp. Cont. Outer Lid Thickness (m)
86 /COM, DCILI = Disp. Cont. Inner Lid Thickness (m)
87 /COM, DCIOG = Disp. Cont. Inner/Outer Lid Gap at top of WP (m)
88 /COM, DCILN = Disp. Cont. Inner Bar. Total length (m)

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89 /COM, DCILI = Disp. Cont. Inner Bar. Inner length (m)
90 DCIRD=1569.0/1000.0/2.0
91 OWALL=0.0500
92 IWALL=0.0200
93 DCORD=DCIRD+IWALL+OWALL
94 DCLN=3230.0/1000.0
95 DCLT=55.0/1000.0
96 DCILT=25.0/1000.0
97 DCIOG=30.0/1000.0
98 DCILN=DCLN-(2.0*DCLT)-DCIOG
99 DCILI=3040.0/1000.0
100 /COM,
101 /COM, Required ceramic and drum parameters:
102 /COM, CDRAD = glass radius (m)
103 /COM, CDHGT = glass height; height of fill (m)
104 /COM, DRMIR = SRP Canister inner rad. (m)
105 /COM, DRMOR = SRP Canister drum outer rad. (m)
106 /COM, DRBTT = SRP Canister thickness at bottom of Canister (m)
107 /COM, DRTPT = SRP Canister thickness at Top of Canister (m)
108 /COM, DRLEN = SRP Canister outer length (m)
109 /COM, DRILN = SRP Canister Inner length (m)
110 /COM, DRGAP = SRP Canister axial gap with inner barrier at bot
111 /COM, DRGPT = SRP Canister axial gap with inner barrier at top
112 /COM, DRMOF = SRP Canister center line off set (m)
113 /COM, PEAKF = Peaking factor to adjust Heat generation dist.
114 /COM, FVOLU = can_volume=PI*glass_fill_radiu^2*glass_length
115 CDRAD=((60.96/2.0)-0.95)/100.0
116 CDHGT=2.1549
117 DRMIR=CDRAD
118 DRMOR=60.96/100.0/2.0
119 DRBTT=15.0/1000.0
120 DRTPT=20.0/1000.0
121 DRLEN=2744.6/1000.0
122 DRILN=DRLEN-DRBTT-DRTPT
123 DRGAP=25.0/1000.0
124 DRGPT=DCILI-DRLEN-DRGAP
125 DRMOF=(DCIRD-(DRMOR*(SQT+1)))/(SQT+1)
126 PEAKF=1.00
127 FVOLU=PI*CDRAD*CDRAD*CDHGT
128 /COM,
129 /COM, Define Extrude Distances as required:
130 /COM, Bottom of WP
131 MIDPT=DCLN/2.0
132 BTPT1=MIDPT-DCLT
133 BTPT2=BTPT1-DCILT
134 BTPT3=BTPT2-DRGAP
135 BTPT4=BTPT3-DRBTT
136 /COM, Top of WP
137 TPPT1=MIDPT-DCLT
138 TPPT2=TPPT1-DCIOG
139 TPPT3=TPPT2-DCILT
140 TPPT4=TPPT3-(DCILI-DRGAP-DRLEN)
141 TPPT5=TPPT4-DRTPT
142 TPPT6=CDHGT-BTPT4
143 /COM,
144 /COM,
145 /COM, *****
146 /COM, Define calculated parameters
147 /COM, ASSY = assembly heat production (W) f(yrs)
148 /COM, FUEL = volumetric heat production (W/m3) f(yrs)
149 *SET, ASSY,
150 *DIM, ASSY, TABLE, 101, 1,
151 *DIM, FUEL, TABLE, 101, 1
152 /COM,
153 /COM, *****
154 /COM, Define 45 degree point of reference:
155 /COM, TCO45 = x coord. WP Center Line Outer Pour Can. at 45 de
156 /COM, TCI45 = x coord. WP Center Line Inner Pour Can. at 45 de
157 /COM, HCI45 = x coord. WP Center Line side of center Glass at
158 /COM, HCO45 = x coord. WP Edge side of center Glass at 45 deg.

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159 /COM,          CCO45 = x coord. Glass Center Line in Pour Can. at 45 de
160 /COM,          SCO45 = x coord. WP Edge Outer Pour Can. at 45 deg.
161 /COM,          SCI45 = x coord. WP Edge Inner Pour Can. at 45 deg.
162 /COM,          MI45 = x coord. DCIRD at 45 deg.
163 /COM,          MO45 = x coord. DCIRD+IWALL at 45 deg.
164 /COM,          DO45 = x coord. DCIRD+IWALL+OWALL at 45 deg.
165 TCO45=(DRMOF+DRMOR-DRMOR/SQT)
166 TCI45=(DRMOF+DRMOR-DRMIR/SQT)
167 HCI45=(DRMOF+DRMOR-(0.5*DRMIR)/SQT)
168 HCO45=(DRMOF+DRMOR+(0.5*DRMIR)/SQT)
169 CCO45=(DRMOF+DRMOR)
170 SCO45=(DRMOF+DRMOR+DRMOR/SQT)
171 SCI45=(DRMOF+DRMOR+DRMIR/SQT)
172 MI45=DCIRD/SQT
173 MO45=(DCIRD+IWALL)/SQT
174 DO45=(DCIRD+IWALL+OWALL)/SQT
175 /COM,
176 /COM,          *****
177 /COM,          Define different element types
178 /PREP7
179 ETYPE
180 ET, 1,55,
181 ET, 2,70,
182 ET, 6,57,
183 ET, 7,32,
184 ET, 11,57,
185 ET, 16,57,
186 ET, 17,32,
187 ET, 18,50,1,
188 ET, 19,31,
189 ET, 26,57,
190 ET, 27,32,
191 ET, 36,57,
192 ET, 46,57,
193 /COM,          *****
194 /COM,          File props01.dat describes material properties
195 /COM,          and thier reference numbers
196 MPREAD,propsd1,dat,
197 /COM,          *****
198 /COM,          Define new material 15 for low thermal loading
199 /COM,          outer barrier of 70/30 Copper Nickel (C71500)
200 /COM,          Density:      DENS      (kg/m^3)
201 /COM,          Emissivity :   EMIS
202 /COM,          Conductivity: KXX      (W/m/K)
203 /COM,          Specific Heat: C      (J/kg/K)
204 MPTEMP
205 MPTEMP, 1, .00000E+00,
206 /COM,          Density (lb/in^3 converted to kg/m^3)
207 MPDATA,DENS,15, 1,(0.323*2.768E+04),
208 /COM,          Emissivity
209 MPDATA,EMIS,15, 1, 0.40000E+00,
210 /COM,          Specific Heat (Btu/lb/F converted to J/kg/K)
211 MPDATA, C,15, 1,(0.09/2.3886E-04),
212 /COM,          Conductivity (Btu/hr/ft/F converted to W/m/K)
213 MPTEMP
214 MPTEMP, 1, (5.0/9.0*(68.0-32.0)), (5.0/9.0*(212.0-32.0)),
215 MPTEMP, 3, (5.0/9.0*(392.0-32.0)), (5.0/9.0*(572.0-32.0)),
216 MPTEMP, 5, (5.0/9.0*(752.0-32.0)), (5.0/9.0*(932.0-32.0)),
217 MPTEMP, 7,(5.0/9.0*(1112.0-32.0)),(5.0/9.0*(1292.0-32.0)),
218 MPDATA, KXX,15, 1, (17.0*1.7307), (16.9*1.7307),
219 MPDATA, KXX,15, 3, (19.7*1.7307), (22.3*1.7307),
220 MPDATA, KXX,15, 5, (24.9*1.7307), (27.8*1.7307),
221 MPDATA, KXX,15, 7, (30.7*1.7307), (33.6*1.7307),
222 /COM,          *****
223 /COM,          Read in single drum heat loads
224 /COM,          Calculate the volumetric heat generation
225 /COM,          (Assembly time is in years, FUEL is in seconds)
226 /INPUT,pusgls2,dat
227 *VFACT,3.15576E7,
228 *MFUN,FUEL(1,0),COPY,ASSY(1,0),

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229 *VFACT,(PEAKF/FVOLUME),
230 *VFUN,FUEL(1),COPY,ASSY(1),
231 FUEL(0,1)=1.0
232 /COM, *****
233 /COM, Define LOCAL Coordinate system for canister orientation
234 /COM, if use CSYS,0, the P. Cans are 2x2,
235 /COM, if use CSYS,15, the P. Cans are 1x2x1
236 /COM,
237 /COM, LOCAL,15,0,0.0,0.0,0.0,45.0,0.0,0.0,
238 /COM, *****
239 /COM, Construct geometry for a single SRP Pour Canister
240 /COM, (K's 1 - 10 )
241 /COM, (L's 1 - 16 )
242 /COM, (A's 1 - 8 )
243 K, 1, 0.0, 0.0, 0.0,
244 K, 2, (DRMOF+DRMOR), (DRMOF+DRMOR), 0.0,
245 K, 3, (DRMOF+DRMOR-DRMIR/SQT), (DRMOF+DRMOR-DRMIR/SQT), 0.0,
246 K, 4, (DRMOF+DRMOR-DRMIR/SQT), (DRMOF+DRMOR+DRMIR/SQT), 0.0,
247 K, 5, (DRMOF+DRMOR+DRMIR/SQT), (DRMOF+DRMOR+DRMIR/SQT), 0.0,
248 K, 6, (DRMOF+DRMOR+DRMIR/SQT), (DRMOF+DRMOR-DRMIR/SQT), 0.0,
249 K, 7, (DRMOF+DRMOR-DRMOR/SQT), (DRMOF+DRMOR-DRMOR/SQT), 0.0,
250 K, 8, (DRMOF+DRMOR-DRMOR/SQT), (DRMOF+DRMOR+DRMOR/SQT), 0.0,
251 K, 9, (DRMOF+DRMOR+DRMOR/SQT), (DRMOF+DRMOR+DRMOR/SQT), 0.0,
252 K, 10, (DRMOF+DRMOR+DRMOR/SQT), (DRMOF+DRMOR-DRMOR/SQT), 0.0,
253 L, 3, 2,
254 L, 2, 6,
255 L, 4, 2,
256 L, 2, 5,
257 LARC, 6, 5,2,CDRAD,
258 LARC, 5, 4,2,CDRAD,
259 LARC, 4, 3,2,CDRAD,
260 LARC, 3, 6,2,CDRAD,
261 L, 7, 3,
262 L, 10, 6,
263 L, 9, 5,
264 L, 8, 4,
265 LARC, 7, 8,2,DRMOR,
266 LARC, 8, 9,2,DRMOR,
267 LARC, 9,10,2,DRMOR,
268 LARC, 10, 7,2,DRMOR,
269 AL, 2, 4, 5,
270 AL, 1, 2, 8,
271 AL, 1, 3, 7,
272 AL, 3, 4, 6,
273 AL, 5,10,15,11,
274 AL, 8, 9,16,10,
275 AL, 7,12,13, 9,
276 AL, 6,11,14,12,
277 /COM, *****
278 /COM, Interior and WP, Next
279 /COM, (K's 11 - 19 )
280 /COM, (L's 17 - 34 )
281 /COM, (A's 9 - 16 )
282 K, 11, DCIRD, 0.0, 0.0,
283 K, 12, MI45, MI45, 0.0,
284 K, 13, 0.0, DCIRD, 0.0,
285 K, 14, (DCIRD+IWALL), 0.0, 0.0,
286 K, 15, MO45, MO45, 0.0,
287 K, 16, 0.0, (DCIRD+IWALL), 0.0,
288 K, 17, DCORD, 0.0, 0.0,
289 K, 18, DO45, DO45, 0.0,
290 K, 19, 0.0, DCORD, 0.0,
291 /COM,
292 L, 1, 7,
293 L, 10, 11,
294 L, 9, 12,
295 L, 8, 13,
296 L, 1, 13,
297 L, 1, 11,
298 LARC, 11, 12, 1, DCIRD,

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299 LARC,12,13,1,DCIRD,
300 L,11,14,
301 L,12,15,
302 L,16,13,
303 LARC,14,15,1,(DCIRD+IWALL),
304 LARC,15,16,1,(DCIRD+IWALL),
305 L,14,17,
306 L,15,18,
307 L,19,16,
308 LARC,18,17,1,DCORD,
309 LARC,19,18,1,DCORD,
310 /COM,
311 AL,22,18,16,17,
312 AL,23,19,15,18,
313 AL,24,20,14,19,
314 AL,21,17,13,20,
315 AL,23,25,28,26,
316 AL,24,26,29,27,
317 AL,28,30,33,31,
318 AL,29,31,34,32,
319 /COM, *****
320 /COM, Set element shapes and sizes
321 /COM,
322 ESHAPE,2,
323 ESIZE,,1,
324 LSEL,S,LINE,, 1, 4,1,
325 LSEL,A,LINE,, 5, 8,1,
326 LSEL,A,LINE,,13,16,1,
327 LSEL,A,LINE,,21,24,1,
328 LSEL,A,LINE,,28,29,1,
329 LSEL,A,LINE,,33,34,1,
330 LESIZE,ALL,,, 4,
331 LSEL,S,LINE,, 9,12,1,
332 LESIZE,ALL,,, 1,
333 LSEL,S,LINE,,17,20,1,
334 LSEL,A,LINE,,25,27,1,
335 LSEL,A,LINE,,30,32,1,
336 LESIZE,ALL,,, 2,
337 LSEL,ALL,
338 /COM,
339 /COM, *****
340 /COM, Mesh areas
341 /COM, glass, stainless pour canister, He, IB, OB,
342 MAT,5,
343 TYPE,1,
344 AMESH, 1, 4,1
345 MAT,1,
346 TYPE,1,
347 AMESH, 5, 8,1
348 MAT, 7,
349 TYPE,1,
350 AMESH, 9,12,1
351 MAT,2,
352 TYPE,1,
353 AMESH,13,14,1
354 MAT,15,
355 TYPE,1,
356 AMESH,15,16,1
357 /COM, *****
358 /COM, Set up paths to extrude 3-D volumes from 2-D surfaces
359 /COM, (K's 20 - 31)
360 /COM, (L's 35 - 46)
361 /COM, Bottom direction first
362 K,20, 0.0, 0.0, (-1.0*BTPT4),
363 K,21, 0.0, 0.0, (-1.0*BTPT3),
364 K,22, 0.0, 0.0, (-1.0*BTPT2),
365 K,23, 0.0, 0.0, (-1.0*BTPT1),
366 K,24, 0.0, 0.0, (-1.0*MIDPT),
367 L, 1,20,
368 L,20,21,

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369 L,21,22,
370 L,22,23,
371 L,23,24,
372 /COM, Top direction Next
373 K,25, 0.0, 0.0, TPPT6,
374 K,26, 0.0, 0.0, TPPT5,
375 K,27, 0.0, 0.0, TPPT4,
376 K,28, 0.0, 0.0, TPPT3,
377 K,29, 0.0, 0.0, TPPT2,
378 K,30, 0.0, 0.0, TPPT1,
379 K,31, 0.0, 0.0, MIDPT,
380 L, 1,25,
381 L,25,26,
382 L,26,27,
383 L,27,28,
384 L,28,29,
385 L,29,30,
386 L,30,31,
387 /COM, *****
388 /COM, Set number of element divisions for extrusion into 3-D
389 /COM,
390 ESHAPE,2,
391 /COM, GLASS
392 LSEL,S,LINE,,35,
393 LESIZE,ALL,,, 3,
394 LSEL,S,LINE,,40,
395 LESIZE,ALL,,, 2,
396 /COM, Interior He Space
397 LSEL,S,LINE,,41,
398 LESIZE,ALL,,, 2,
399 /COM, Canister Shell
400 LSEL,S,LINE,,36,
401 LSEL,A,LINE,,42,
402 LESIZE,ALL,,, 1,
403 /COM, Interior WP He Space
404 LSEL,S,LINE,,37,
405 LESIZE,ALL,,, 2,
406 LSEL,S,LINE,,43,
407 LESIZE,ALL,,, 3,
408 /COM, Inner Barrier Lids
409 LSEL,S,LINE,,38,
410 LSEL,A,LINE,,44,
411 LESIZE,ALL,,, 2,
412 /COM, Outer/Inner Barrier Gap (HE)
413 LSEL,S,LINE,,45,
414 LESIZE,ALL,,, 2,
415 /COM, Outer Barrier Lids
416 LSEL,S,LINE,,39,
417 LSEL,A,LINE,,46,
418 LESIZE,ALL,,, 2,
419 LSEL,ALL,
420 /COM, *****
421 /COM, Reset coordinates if CSYS,15, option was used
422 /COM,
423 CSYS,0,
424 /COM, *****
425 /COM, Set up drift wall radiation matrix
426 /COM, (K's 32 - 34)
427 /COM, 1) Define K's for extrude (will not use)
428 K,32, 0.0, OFFST, 0.0,
429 K,33, 0.0, OFFST, (WPSPC/2.0),
430 K,34, 0.0, OFFST, -1*(WPSPC/2.0),
431 /COM, Define extrude lines (will not use)
432 /COM, (L's 47,48 )
433 L,32,33,
434 L,32,34,
435 /COM, Extrude drift 8 elements with smallest
436 /COM, elements at WP mid-length (will not use)
437 LESIZE,47,,,8,8.4
438 LESIZE,48,,,8,8.4

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439 /COM,                2) Define K's and lines for lines of drift wall
440 /COM,                (K's 35 - 39)
441 /COM,                (L's 49 - 53)
442 /COM,                Center Point
443 K,35,                XXX,                YYY, 0.0,
444 K,36,                DFRAD,                OFFST, 0.0,
445 K,37,                0.0,( OFFST+DFRAD), 0.0,
446 K,38,(0.0-DFRAD),    OFFST, 0.0,
447 K,39, (0.0-XXX),      YYY, 0.0,
448 LARC,35,36,32,DFRAD,
449 LARC,36,37,32,DFRAD,
450 LARC,37,38,32,DFRAD,
451 LARC,38,39,32,DFRAD,
452 L,39,35,
453 /COM,                Set element spacing for meshing
454 LESIZE,49,,,4,
455 LESIZE,50,,,4,
456 LESIZE,51,,,4,
457 LESIZE,52,,,4,
458 LESIZE,53,,,4,
459 /COM,                Back Point
460 /COM,                (K's 40 - 44)
461 /COM,                (L's 54 - 58)
462 K,40,                XXX,                YYY, -1*(WSPC/2.0),
463 K,41,                DFRAD,                OFFST, -1*(WSPC/2.0),
464 K,42,                0.0,( OFFST+DFRAD), -1*(WSPC/2.0),
465 K,43,(0.0-DFRAD),    OFFST, -1*(WSPC/2.0),
466 K,44, (0.0-XXX),      YYY, -1*(WSPC/2.0),
467 LARC,40,41,34,DFRAD,
468 LARC,41,42,34,DFRAD,
469 LARC,42,43,34,DFRAD,
470 LARC,43,44,34,DFRAD,
471 L,44,40,
472 /COM,                Set element spacing for meshing
473 LESIZE,54,,,4,
474 LESIZE,55,,,4,
475 LESIZE,56,,,4,
476 LESIZE,57,,,4,
477 LESIZE,58,,,4,
478 /COM,                Front Point
479 /COM,                (K's 45 - 49)
480 /COM,                (L's 59 - 63)
481 K,45,                XXX,                YYY, (WSPC/2.0),
482 K,46,                DFRAD,                OFFST, (WSPC/2.0),
483 K,47,                0.0,( OFFST+DFRAD), (WSPC/2.0),
484 K,48,(0.0-DFRAD),    OFFST, (WSPC/2.0),
485 K,49, (0.0-XXX),      YYY, (WSPC/2.0),
486 LARC,45,46,33,DFRAD,
487 LARC,46,47,33,DFRAD,
488 LARC,47,48,33,DFRAD,
489 LARC,48,49,33,DFRAD,
490 L,49,45,
491 /COM,                Set element spacing for meshing
492 LESIZE,59,,,4,
493 LESIZE,60,,,4,
494 LESIZE,61,,,4,
495 LESIZE,62,,,4,
496 LESIZE,63,,,4,
497 /COM,                3) Create connecting lines for wall; make areas
498 /COM,                (L's 64 - 68 )
499 L,35,40,
500 L,36,41,
501 L,37,42,
502 L,38,43,
503 L,39,44,
504 LESIZE,64,,,8,8.4
505 LESIZE,65,,,8,8.4
506 LESIZE,66,,,8,8.4
507 LESIZE,67,,,8,8.4
508 LESIZE,68,,,8,8.4

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509 /COM, (L's 69 - 73 )
510 L,45,35,
511 L,46,36,
512 L,47,37,
513 L,48,38,
514 L,49,39,
515 LESIZE,69,,,8,0.119
516 LESIZE,70,,,8,0.119
517 LESIZE,71,,,8,0.119
518 LESIZE,72,,,8,0.119
519 LESIZE,73,,,8,0.119
520 /COM,
521 /COM, Define cylindrical coordinate system for rotations, etc.
522 LOCAL,11,1,0,0,0,0,0,
523 /COM, (A's 17 - 26 )
524 AL,49,65,54,64,
525 AL,50,66,55,65,
526 AL,51,67,56,66,
527 AL,52,68,57,67,
528 /COM,
529 AL,59,70,49,69,
530 AL,60,71,50,70,
531 AL,61,72,51,71,
532 AL,62,73,52,72,
533 /COM,
534 AL,53,64,58,68,
535 AL,63,69,53,73,
536 /COM,
537 CSYS,0,
538 /COM, 4) Set material type and Mesh areas
539 MAT, 6,
540 TYPE,11,
541 AMESH, 17, 24,1
542 MAT, 4,
543 TYPE,11,
544 AMESH, 25, 26,1
545 /COM, 5) Set 3-D radiation shell elements
546 TYPE,46,
547 ASEL,S,AREA,,17,26,1
548 NSLA,S,1,
549 ESURF,
550 ASEL,ALL,
551 LSEL,ALL,
552 KSEL,ALL,
553 /COM, *****
554 /COM, Construct geometry for WP TOP end
555 /COM, (K's 50 - 55 )
556 K,50, DCIRD, 0.0, TPPT4,
557 K,51, 0.0, DCIRD, TPPT4,
558 /COM,
559 K,52, (DCIRD+IWALL), 0.0, TPPT4,
560 K,53, 0.0, (DCIRD+IWALL), TPPT4,
561 /COM,
562 K,54, DCORD, 0.0, TPPT4,
563 K,55, 0.0, DCORD, TPPT4,
564 /COM,
565 /COM, (L's 74 - 79 )
566 L,27,50,
567 L,27,51,
568 L,50,52,
569 L,51,53,
570 L,52,54,
571 L,53,55,
572 /COM, (L's 80 - 82 )
573 LARC,50,51,27,DCIRD,
574 LARC,52,53,27,(DCIRD+IWALL),
575 LARC,54,55,27,DCORD,
576 /COM,
577 LSEL,S,LINE,,74,75,1,
578 LSEL,A,LINE,,80,82,1,

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579 LESIZE,ALL,,, 8,
580 LSEL,S,LINE,,76,79,1,
581 LESIZE,ALL,,, 2,
582 ASEL,ALL,
583 LSEL,ALL,
584 KSEL,ALL,
585 /COM, (A's 27 - 29 )
586 AL,74,75,80,
587 AL,80,76,81,77,
588 AL,81,78,82,79,
589 /COM, *****
590 /COM, Construct geometry for WP Bottom end
591 /COM, (K's 56 - 61 )
592 K,56, DCIRD, 0.0, (-1.0*BTPT3),
593 K,57, 0.0, DCIRD, (-1.0*BTPT3),
594 /COM,
595 K,58, (DCIRD+IWALL), 0.0, (-1.0*BTPT3),
596 K,59, 0.0, (DCIRD+IWALL), (-1.0*BTPT3),
597 /COM,
598 K,60, DCORD, 0.0, (-1.0*BTPT3),
599 K,61, 0.0, DCORD, (-1.0*BTPT3),
600 /COM,
601 /COM, (L's 83 - 88)
602 L,21,56,
603 L,21,57,
604 L,56,58,
605 L,57,59,
606 L,58,60,
607 L,59,61,
608 /COM, (L's 89 - 91 )
609 LARC,56,57,21,DCIRD,
610 LARC,58,59,21,(DCIRD+IWALL),
611 LARC,60,61,21,DCORD,
612 /COM,
613 LSEL,S,LINE,,83,84,1,
614 LSEL,A,LINE,,89,91,1,
615 LESIZE,ALL,,, 8,
616 LSEL,S,LINE,,85,88,1,
617 LESIZE,ALL,,, 2,
618 ASEL,ALL,
619 LSEL,ALL,
620 KSEL,ALL,
621 /COM, (A's 30 - 32 )
622 AL,83,84,89,
623 AL,89,85,90,86,
624 AL,90,87,91,88,
625 /COM, Mesh areas
626 /COM, Top and Bottom WP Ends
627 ESHAPE,2,
628 MAT,15,
629 TYPE,1,
630 AMESH,27,32,1
631 /COM, *****
632 /COM, Extrude 2-D WP Interior into 3-D Space
633 /COM, (V's 1 - 32)
634 /COM, Bottom WP Area
635 VDRAG, 1, 2, 3, 4,,,35,36,,,
636 VDRAG, 5, 6, 7, 8,,,35,36,,,
637 VDRAG, 9,10,11,12,,,35,36,,,
638 VDRAG,13,14,,,,,35,36,,,
639 VDRAG,15,16,,,,,35,36,,,
640 NUMMRG,KP,
641 /COM, (V's 33 - 80)
642 /COM, Top WP Area
643 VDRAG, 1, 2, 3, 4,,,40,41,42,,,
644 VDRAG, 5, 6, 7, 8,,,40,41,42,,,
645 VDRAG, 9,10,11,12,,,40,41,42,,,
646 VDRAG,13,14,,,,,40,41,42,,,
647 VDRAG,15,16,,,,,40,41,42,,,
648 NUMMRG,KP,

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649 /COM,          Extrude 2-D WP Ends into 3-D Space
650 /COM,          (V's 81 - 89)
651 /COM,          Bottom WP Area
652 VDRAG,30,31,32,,,,37,38,39,
653 NUMMRG,KP,
654 /COM,          (V's 90 - 101)
655 /COM,          Top WP Area
656 VDRAG,27,28,29,,,,43,44,45,46,
657 NUMMRG,KP,
658 /COM,          *****
659 /COM,          Mesh Volumes - which are solid volumes - leave gaps to last
660 /COM,          Glass First
661 ESHAPE,2,
662 MAT, 5,
663 TYPE,2,
664 VMESH, 1, 4,1
665 VMESH, 33, 36,1
666 /COM,          SS in Pour Can.
667 ESHAPE,2,
668 MAT, 1,
669 TYPE,2,
670 VMESH, 5, 8,1
671 VMESH, 9, 16,1
672 VMESH, 41, 44,1
673 VMESH, 45, 56,1
674 /COM,          In. Bar. Material for WP
675 ESHAPE,2,
676 MAT, 2,
677 TYPE,2,
678 VMESH, 25, 28,1
679 VMESH, 69, 74,1
680 VMESH, 82,
681 VMESH, 84, 85,1
682 VMESH, 91,
683 VMESH, 93, 94,1
684 /COM,          Out. Bar. Material for WP
685 ESHAPE,2,
686 MAT,15,
687 TYPE,2,
688 VMESH, 29, 32,1
689 VMESH, 75, 80,1
690 VMESH, 83,
691 VMESH, 86, 89,1
692 VMESH, 92, 95,3
693 VMESH, 98,101,1
694 /COM,          DONT MESH OR ASSIGN MAT. ASSUME VOID SPACES
695 /COM,          AND NO RADIATION TRANSFER IN THESE SPACES
696 /COM,          He/Air in Pour Can.
697 /COM,          ESHAPE,2,
698 /COM,          MAT, 7,
699 /COM,          TYPE,2,
700 /COM,          VMESH, 37, 40,1
701 /COM,          He/Air in WP I/O Bar. Gap - NO RADIATION
702 /COM,          ESHAPE,2,
703 /COM,          MAT, 7,
704 /COM,          TYPE,2,
705 /COM,          VMESH, 96, 97,1
706 /COM,          *****
707 /COM,          Clear 2-D mesh
708 ASEL,S,TYPE,,1,
709 ACLEAR,ALL,
710 ASEL,ALL,
711 ESEL,ALL,
712 NSEL,ALL,
713 VSEL,ALL,
714 LSEL,ALL,
715 NUMMRG,ELEM,
716 NUMMRG,NODE,
717 NUMMRG,KP,
718 /COM,          *****

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719 /COM,      Rotate this set into the other quadrants about the Z axis
720 /COM,      (V's 102 - 404)
721 /COM,
722 CSYS,11,
723 /COM,
724 /COM,      (V's 102 - 202)
725 VGEN,2,1,101,1,0.0, 90.0,0.0,0,0,0,
726 /COM,      (V's 203 - 303)
727 VGEN,2,1,101,1,0.0,180.0,0.0,0,0,0,
728 /COM,      (V's 304 - 404)
729 VGEN,2,1,101,1,0.0,270.0,0.0,0,0,0,
730 CSYS,0,
731 NUMMRG,ELEM,
732 NUMMRG,NODE,
733 NUMMRG,KP,
734 /COM,      *****
735 /COM,      Define Some LOCAL Coordinate Systems for use
736 /COM,      IF THE CSYS,15, WAS USED... THESE MUST BE REDEFINED TO THE
737 /COM,      POUR CANISTER CENTER LINES.... I.E. THE X-Y's ARE ON AXIS
738 /COM,
739 LOCAL,21,0,      (DRMOF+DRMCR),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
740 LOCAL,22,0,      (DRMOF+DRMOR),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
741 LOCAL,23,0,(-1.0*(DRMOF+DRMOR)),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
742 LOCAL,24,0,(-1.0*(DRMOF+DRMOR)),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
743 /COM,
744 LOCAL,31,1,      (DRMOF+DRMOR),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
745 LOCAL,32,1,      (DRMOF+DRMOR),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
746 LOCAL,33,1,(-1.0*(DRMOF+DRMOR)),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
747 LOCAL,34,1,(-1.0*(DRMOF+DRMOR)),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
748 /COM,
749 CSYS,0,
750 /COM,      *****
751 /COM,      Define Elements for radiation
752 /COM, In Pour Canister First; Glass Surf. Can #1 - ASSUME NO RAD. DONT DO
753 /COM, TYPE,6,
754 /COM, VSEL,S,MAT,,5,
755 /COM, ASEL,S,EXT,
756 /COM, CSYS,31,
757 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
758 /COM, CSYS,0,
759 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
760 /COM, NSLA,S,1,
761 /COM, ESURF,
762 /COM,      Inner SS. Lid of Can. #1
763 /COM, TYPE,6,
764 /COM, VSEL,S,MAT,,1,
765 /COM, ASEL,S,EXT,
766 /COM, CSYS,31,
767 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
768 /COM, CSYS,0,
769 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
770 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
771 /COM, NSLA,S,1,
772 /COM, ESURF,
773 /COM,      Inner SS. Side of Can. #1
774 /COM, TYPE,6,
775 /COM, VSEL,S,MAT,,1,
776 /COM, ASEL,S,EXT,
777 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
778 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
779 /COM, CSYS,31,
780 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
781 /COM, CSYS,0,
782 /COM, NSLA,S,1,
783 /COM, ESURF,
784 /COM,      *****
785 /COM,      Define Elements for radiation
786 /COM,      In Pour Canister First; Glass Surf. Can #2
787 /COM, TYPE,6,
788 /COM, VSEL,S,MAT,,5,

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789 /COM, ASEL,S,EXT,
790 /COM, CSYS,32,
791 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
792 /COM, CSYS,0,
793 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
794 /COM, NSLA,S,1,
795 /COM, ESURF,
796 /COM, Inner SS. Lid of Can. #2
797 /COM, TYPE,6,
798 /COM, VSEL,S,MAT,,1,
799 /COM, ASEL,S,EXT,
800 /COM, CSYS,32,
801 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
802 /COM, CSYS,0,
803 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
804 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
805 /COM, NSLA,S,1,
806 /COM, ESURF,
807 /COM, Inner SS. Side of Can. #2
808 /COM, TYPE,6,
809 /COM, VSEL,S,MAT,,1,
810 /COM, ASEL,S,EXT,
811 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
812 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
813 /COM, CSYS,32,
814 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
815 /COM, CSYS,0,
816 /COM, NSLA,S,1,
817 /COM, ESURF,
818 /COM, *****
819 /COM, Define Elements for radiation
820 /COM, In Pour Canister First; Glass Surf. Can #3
821 /COM, TYPE,6,
822 /COM, VSEL,S,MAT,,5,
823 /COM, ASEL,S,EXT,
824 /COM, CSYS,33,
825 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
826 /COM, CSYS,0,
827 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
828 /COM, NSLA,S,1,
829 /COM, ESURF,
830 /COM, Inner SS. Lid of Can. #3
831 /COM, TYPE,6,
832 /COM, VSEL,S,MAT,,1,
833 /COM, ASEL,S,EXT,
834 /COM, CSYS,33,
835 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
836 /COM, CSYS,0,
837 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
838 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
839 /COM, NSLA,S,1,
840 /COM, ESURF,
841 /COM, Inner SS. Side of Can. #3
842 /COM, TYPE,6,
843 /COM, VSEL,S,MAT,,1,
844 /COM, ASEL,S,EXT,
845 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
846 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
847 /COM, CSYS,33,
848 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
849 /COM, CSYS,0,
850 /COM, NSLA,S,1,
851 /COM, ESURF,
852 /COM, *****
853 /COM, Define Elements for radiation
854 /COM, In Pour Canister First; Glass Surf. Can #4
855 /COM, TYPE,6,
856 /COM, VSEL,S,MAT,,5,
857 /COM, ASEL,S,EXT,
858 /COM, CSYS,34,

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859 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
860 /COM, CSYS,0,
861 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
862 /COM, NSLA,S,1,
863 /COM, ESURF,
864 /COM, Inner SS. Lid of Can. #4
865 /COM, TYPE,6,
866 /COM, VSEL,S,MAT,,1,
867 /COM, ASEL,S,EXT,
868 /COM, CSYS,34,
869 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
870 /COM, CSYS,0,
871 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
872 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
873 /COM, NSLA,S,1,
874 /COM, ESURF,
875 /COM, Inner SS. Side of Can. #4
876 /COM, TYPE,6,
877 /COM, VSEL,S,MAT,,1,
878 /COM, ASEL,S,EXT,
879 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
880 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
881 /COM, CSYS,34,
882 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
883 /COM, CSYS,0,
884 /COM, NSLA,S,1,
885 /COM, ESURF,
886 /COM, *****
887 /COM, Define Elements for radiation - Between Can and IB
888 /COM, Pour Can. Surf.
889 /COM, Top Can #1
890 TYPE,26,
891 VSEL,S,MAT,,1,
892 ASEL,S,EXT,
893 CSYS,31,
894 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
895 CSYS,0,
896 ASEL,R,LOC,Z,TPPT4,TPPT4,
897 NSLA,S,1,
898 ESURF,
899 /COM, Sides Can #1
900 TYPE,26,
901 VSEL,S,MAT,,1,
902 ASEL,S,EXT,
903 ASEL,U,LOC,Z,(TPPT4-0.0001),100.0,
904 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),-100.0,
905 CSYS,31,
906 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
907 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
908 CSYS,0,
909 NSLA,S,1,
910 ESURF,
911 /COM, Bottom Can #1
912 TYPE,26,
913 VSEL,S,MAT,,1,
914 ASEL,S,EXT,
915 CSYS,31,
916 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
917 CSYS,0,
918 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
919 NSLA,S,1,
920 ESURF,
921 /COM, -----
922 /COM, Top Can #2
923 TYPE,26,
924 VSEL,S,MAT,,1,
925 ASEL,S,EXT,
926 CSYS,32,
927 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
928 CSYS,0,

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929 ASEL,R,LOC,Z,TPPT4,TPPT4,
930 NSLA,S,1,
931 ESURF,
932 /COM,                Sides Can #2
933 TYPE,26,
934 VSEL,S,MAT,,1,
935 ASEL,S,EXT,
936 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
937 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
938 CSYS,32,
939 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
940 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
941 CSYS,0,
942 NSLA,S,1,
943 ESURF,
944 /COM,                Bottom Can #2
945 TYPE,26,
946 VSEL,S,MAT,,1,
947 ASEL,S,EXT,
948 CSYS,32,
949 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
950 CSYS,0,
951 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
952 NSLA,S,1,
953 ESURF,
954 /COM, -----
955 /COM,                Top Can #3
956 TYPE,26,
957 VSEL,S,MAT,,1,
958 ASEL,S,EXT,
959 CSYS,33,
960 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
961 CSYS,0,
962 ASEL,R,LOC,Z,TPPT4,TPPT4,
963 NSLA,S,1,
964 ESURF,
965 /COM,                Sides Can #3
966 TYPE,26,
967 VSEL,S,MAT,,1,
968 ASEL,S,EXT,
969 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
970 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
971 CSYS,33,
972 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
973 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
974 CSYS,0,
975 NSLA,S,1,
976 ESURF,
977 /COM,                Bottom Can #3
978 TYPE,26,
979 VSEL,S,MAT,,1,
980 ASEL,S,EXT,
981 CSYS,33,
982 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
983 CSYS,0,
984 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
985 NSLA,S,1,
986 ESURF,
987 /COM, -----
988 /COM,                Top Can #4
989 TYPE,26,
990 VSEL,S,MAT,,1,
991 ASEL,S,EXT,
992 CSYS,34,
993 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
994 CSYS,0,
995 ASEL,R,LOC,Z,TPPT4,TPPT4,
996 NSLA,S,1,
997 ESURF,
998 /COM,                Sides Can #4

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999 TYPE,26,
1000 VSEL,S,MAT,,1,
1001 ASEL,S,EXT,
1002 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
1003 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
1004 CSYS,34,
1005 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
1006 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
1007 CSYS,0,
1008 NSLA,S,1,
1009 ESURF,
1010 /COM, Bottom Can #4
1011 TYPE,26,
1012 VSEL,S,MAT,,1,
1013 ASEL,S,EXT,
1014 CSYS,34,
1015 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
1016 CSYS,0,
1017 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
1018 NSLA,S,1,
1019 ESURF,
1020 /COM, Inner Barrier Inside Surfaces
1021 TYPE,26,
1022 VSEL,S,MAT,,2,
1023 ASEL,S,EXT,
1024 ASEL,U,LOC,Z,(TPPT3+0.001),100,
1025 ASEL,U,LOC,Z,(-1.0*BTPT2-0.001),-100,
1026 CSYS,11,
1027 ASEL,U,LOC,X,(DCIRD+0.001),100,
1028 CSYS,0,
1029 NSLA,S,1,
1030 ESURF,
1031 /COM, *****
1032 /COM, Define Elements for radiation
1033 /COM, In Inner Barrier / Out Barrier Gap - ASSUME NO RAD. SO DONT DEFINE
1034 /COM, Top of Inner Barrier Lid
1035 /COM, TYPE,16,
1036 /COM, VSEL,S,MAT,,2,
1037 /COM, ASEL,S,EXT,
1038 /COM, ASEL,R,LOC,Z,(TPPT2-0.001),(TPPT2+0.001),
1039 /COM, NSLA,S,1,
1040 /COM, ESURF,
1041 /COM, Bottom of Outer Barrier Lid
1042 /COM, TYPE,16,
1043 /COM, ASEL,S,LOC,Z,(TPPT1-0.001),(TPPT1+0.001),
1044 /COM, ASEL,U,AREA,,346,
1045 /COM, ASEL,U,AREA,,702,
1046 /COM, ASEL,U,AREA,,1058,
1047 /COM, ASEL,U,AREA,,1414,
1048 /COM, NSLA,S,1,
1049 /COM, ESURF,
1050 /COM, Side of Outer Barrier WP (Inside Surface)
1051 /COM, TYPE,16,
1052 /COM, VSEL,S,MAT,,15,
1053 /COM, ASEL,S,EXT,
1054 /COM, CSYS,11,
1055 /COM, ASEL,U,LOC,X,(DCORD-IWALL),100,
1056 /COM, CSYS,0,
1057 /COM, ASEL,U,LOC,Z,-100,TPPT2,
1058 /COM, ASEL,U,LOC,Z,TPPT1,100,
1059 /COM, NSLA,S,1,
1060 /COM, ESURF,
1061 /COM, *****
1062 /COM, Define Elements for radiation
1063 /COM, Outer Surface of Waste Package
1064 TYPE,36,
1065 /COM, Bottom Lid
1066 VSEL,S,MAT,,15,
1067 ASEL,S,EXT,
1068 ASEL,R,LOC,Z,(-1.0*MIDPT+0.001),(-1.0*MIDPT-0.001),

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1069 NSLA,S,1,
1070 ESURF,
1071 /COM, Side of WP
1072 VSEL,S,MAT,,15,
1073 ASEL,S,EXT,
1074 CSYS,11,
1075 ASEL,U,LOC,X,(-1.0*DCORD+0.001),(DCORD-0.001),
1076 CSYS,0,
1077 NSLA,S,1,
1078 ESURF,
1079 /COM, Top Lid
1080 VSEL,S,MAT,,15,
1081 ASEL,S,EXT,
1082 ASEL,R,LOC,Z,(MIDPT-0.001),(MIDPT+0.001),
1083 NSLA,S,1,
1084 ESURF,
1085 FINISH
1086 SAVE,
1087 /COM, *****
1088 /COM, Generate super-elements
1089 /AUX12,
1090 /COM,
1091 ESEL,S,TYPE,,26,
1092 NSLE,S,
1093 STEF,5.67E-8,
1094 GEOM,0,
1095 VTYPE,0,100,
1096 WRITE,ibrcangap,
1097 ESEL,ALL,
1098 NSEL,ALL,
1099 FINISH
1100 /COM,
1101 /AUX12,
1102 ESEL,S,TYPE,,36,
1103 ESEL,A,TYPE,,46,
1104 NSLE,S,
1105 STEF,5.67E-8,
1106 GEOM,0,
1107 VTYPE,0,100,
1108 WRITE,obdrwgap,
1109 ESEL,ALL,
1110 NSEL,ALL,
1111 FINISH
1112 /COM, - DO NOT DO RADITATION FOR INTERNAL P. CAN OR THE I/O B. GAP
1113 /COM, /AUX12,
1114 /COM, ESEL,S,TYPE,,16,
1115 /COM, NSLE,S,
1116 /COM, STEF,5.67E-8,
1117 /COM, GEOM,0,
1118 /COM, VTYPE,0,100,
1119 /COM, WRITE,iobargap,
1120 /COM, ESEL,ALL,
1121 /COM, NSEL,ALL,
1122 /COM, FINISH
1123 /COM, /COM,
1124 /COM, /AUX12,
1125 /COM, ESEL,S,TYPE,,6,
1126 /COM, NSLE,S,
1127 /COM, STEF,5.67E-8,
1128 /COM, GEOM,0,
1129 /COM, VTYPE,0,100,
1130 /COM, WRITE,glscangap,
1131 /COM,
1132 ESEL,ALL,
1133 NSEL,ALL,
1134 FINISH
1135 /PREP7,
1136 TYPE,18,
1137 /COM, SE,glscangap,
1138 /COM, SE,iobargap,

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1139 SE,ibrcangap,
1140 SE,obrdwgap,
1141 /COM,          Delete radiation edge elements
1142 ESEL,S,TYPE,, 6,
1143 ESEL,A,TYPE,,16,
1144 ESEL,A,TYPE,,26,
1145 ESEL,A,TYPE,,36,
1146 ESEL,A,TYPE,,46,
1147 EDELE,ALL,
1148 ESEL,ALL,
1149 LSEL,ALL,
1150 /COM,          *****
1151 /COM,          Define SHELL Element thicknesses; Required for solution:
1152 R,1,0.001,0.001,0.001,0.001,0.0,
1153 FINISH
1154 SAVE,
1155 /COM,          *****
1156 /COM,          Gaps in WP between glass, can, Inner Barrier and Outer Barrier.....
1157 /COM,          DONT MESH; Either Assume its VOID or its meshed earlier
1158 /COM,          This section used only if both rad. and He conducti
1159 /COM,          is used in the model.
1160 /COM,          He/Air in WP I/O Bar. Gap
1161 /COM,          /PREP7
1162 /COM,          ESHAPE,2,
1163 /COM,          MAT, 7,
1164 /COM,          TYPE,2,
1165 /COM,          VMESH, 96, 97,1
1166 /COM,          VMESH,197,198,1
1167 /COM,          VMESH,298,299,1
1168 /COM,          VMESH,399,400,1
1169 /COM,
1170 /COM,
1171 /COM,          Now Mesh inside of WP; DONT MESH Assume VOID
1172 /COM,          He space in WP
1173 /COM,          ESHAPE,2,
1174 /COM,          MAT, 7,
1175 /COM,          TYPE,2,
1176 /COM,          VMESH, 17, 24,1
1177 /COM,          VMESH,118,125,1
1178 /COM,          VMESH,219,226,1
1179 /COM,          VMESH,320,327,1
1180 /COM,
1181 /COM,          VMESH, 57, 68,1
1182 /COM,          VMESH,158,169,1
1183 /COM,          VMESH,259,270,1
1184 /COM,          VMESH,360,371,1
1185 /COM,
1186 /COM,          VMESH, 81,
1187 /COM,          VMESH,182,
1188 /COM,          VMESH,283,
1189 /COM,          VMESH,384,
1190 /COM,
1191 /COM,          VMESH, 90,
1192 /COM,          VMESH,191,
1193 /COM,          VMESH,292,
1194 /COM,          VMESH,393,
1195 /COM,
1196 /COM,          Now Mesh inside of Can DONT MESH Assume VOID
1197 /COM,          He/Air in Pour Can.
1198 /COM,          ESHAPE,2,
1199 /COM,          MAT, 7,
1200 /COM,          TYPE,2,
1201 /COM,          VMESH, 37, 40,1
1202 /COM,          VMESH,138,141,1
1203 /COM,          VMESH,239,242,1
1204 /COM,          VMESH,340,343,1
1205 /COM,
1206 /COM,          NUMMRG,ELEM,
1207 /COM,          NUMMRG,NODE,
1208 /COM,          NUMMRG,KP,

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1209 /COM, FINISH
1210 /COM, *****
1211 /COM, Create element mesh plots to illustrate model
1212 /POST1,
1213 /COM, View model meshing from drift end view
1214 /RESET,
1215 /TYPE,,HIDP,
1216 /VIEW,1,0,0,1,
1217 /DIST,1,5,0,
1218 /NUM, 1,
1219 /TRIAD,OFF,
1220 /PNUM,MAT , 1,
1221 VSEL,S,LOC,Z,-100,0.0,
1222 ESLV,S
1223 ASEL,S,AREA,,17,26,1
1224 ASEL,R,LOC,Z,-100.0,0.0,
1225 ESLA,A
1226 /TITLE, DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH
1227 /SHOW,meshfct,grph,0,8,
1228 EPLT
1229 /COM, View model meshing for 45 side cut-away
1230 /RESET,
1231 /TYPE,,HIDP,
1232 /VIEW,1,1,1,1,
1233 /DIST,1,5,0,
1234 /NUM, 1,
1235 /TRIAD,OFF,
1236 /PNUM,MAT , 1,
1237 VSEL,S,MAT,,1,5,4
1238 CSYS,31,
1239 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1240 VSEL,U,LOC,Y,-45.0,135.0,
1241 CSYS,0,
1242 ESLV,S
1243 VSEL,S,MAT,,1,5,4
1244 CSYS,32,
1245 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1246 VSEL,U,LOC,Y,-45.0,45.0,
1247 CSYS,0,
1248 ESLV,A
1249 VSEL,S,LOC,X,-100.0,0.0,
1250 ESLV,A
1251 ASEL,S,AREA,,17,26,1
1252 ASEL,R,LOC,X,-100.0,0.0,
1253 ESLA,A
1254 /TITLE, DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH
1255 /SHOW,meshcut,grph,0,8,
1256 EPLT
1257 /COM, View model meshing for 90 side cut-away
1258 /RESET,
1259 /TYPE,,HIDP,
1260 /VIEW,1,1,0,0,
1261 /DIST,1,5,0,
1262 /NUM, 1,
1263 /TRIAD,OFF,
1264 /PNUM,MAT , 1,
1265 VSEL,S,LOC,X,-100,0.0,
1266 ESLV,S
1267 ASEL,S,AREA,,17,26,1
1268 ASEL,R,LOC,X,-100.0,0.0,
1269 ESLA,A
1270 /TITLE, DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH
1271 /SHOW,meshsct,grph,0,8,
1272 EPLT
1273 FINISH
1274 /COM, *****
1275 /COM, Set solution parameters and apply B.C.'s
1276 /COM,
1277 /COM, Solve steady-state for initial conditions
1278 /COM, with WP surface equal to drift ambient

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1279 /COM,          temperature from repository model.
1280 /SOLU
1281 ANTYPE,TRAN,NEW,
1282 NROPT,AUTO,
1283 TRNOPT,FULL,
1284 TOFFST,273.15,
1285 /COM,          Apply Drift Wall Temp. BC
1286 ASEL,S,AREA,,17,26,1
1287 NSLA,S,1,
1288 D,ALL,TEMP,DFAMBT,
1289 ASEL,ALL,
1290 NSEL,ALL,
1291 /COM,          Apply Heat Generation BC to glass
1292 VSEL,S,MAT,,5,
1293 ESLV,S,
1294 BFE,ALL,HGEN,,(FUEL(TM_START)),
1295 VSEL,ALL,
1296 NSEL,ALL,
1297 ESEL,ALL,
1298 /COM,          Set Solution Params and solve
1299 TIMINT,OFF,
1300 TIME,1e-6,
1301 AUTOTS,ON,
1302 KBC,0,
1303 SOLVE
1304 /COM,
1305 /COM,          Solve steady-state for initial conditions
1306 /COM,          with WP surface temperatures from repository
1307 /COM,          steady-state solution.
1308 /COM,          Apply Drift Wall Temp. BC
1309 ASEL,S,AREA,,17,26,1
1310 NSLA,S,1,
1311 DDELE,ALL,TEMP,
1312 ASEL,ALL,
1313 NSEL,ALL,
1314 ASEL,S,AREA,,17,26,1
1315 NSLA,S,1,
1316 D,ALL,TEMP,(DFSID(TM_START)),
1317 ASEL,ALL,
1318 NSEL,ALL,
1319 /COM,          Apply Heat Generation BC to glass
1320 VSEL,S,MAT,,5,
1321 ESLV,S,
1322 BFE,ALL,HGEN,,(FUEL(TM_START)),
1323 VSEL,ALL,
1324 NSEL,ALL,
1325 ESEL,ALL,
1326 /COM,          Set Solution Params and solve
1327 TIMINT,OFF,
1328 TIME,2e-6,
1329 AUTOTS,ON,
1330 KBC,0,
1331 SOLVE
1332 SAVE,
1333 /COM,          *****
1334 /COM,          SOLVE A SET OF STEADY STATE POINTS FOR GRINS AND GIGGLES
1335 TIMINT,OFF,
1336 AUTOTS,ON,
1337 /COM,          Time substep ranges from 10 sec to 1/4 loadstep
1338 /COM,          NSUBST,10,20,5,ON
1339 /COM,          Begin Transient
1340 /COM,          Apply loads and solve for 0 to .9 years
1341 *DO,TM,TM_START,TMEO,TMIO
1342 TIME,TM,
1343 VSEL,S,MAT,,5,
1344 ESLV,S,
1345 BFE,ALL,HGEN,,(FUEL(TM)),
1346 VSEL,ALL
1347 ESEL,ALL
1348 ASEL,S,AREA,,17,26,1

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1349      NSLA,S,1,
1350      DDELE,ALL,TEMP,
1351      ASEL,ALL,
1352      NSEL,ALL,
1353      ASEL,S,AREA,,17,26,1
1354      NSLA,S,1,
1355      D,ALL,TEMP,(DFSID(TM)),
1356      ASEL,ALL,
1357      NSEL,ALL,
1358      SOLVE
1359 *ENDDO
1360 /COM,   NSUBST,10,25,10,ON
1361 /COM,   Apply loads and solve for 1 to 9 years
1362 *DO,TM,TME1,TME9,TM11
1363      TIME,TM,
1364      VSEL,S,MAT,,5,
1365      ESLV,S,
1366      BFE,ALL,HGEN,,(FUEL(TM)),
1367      VSEL,ALL
1368      ESEL,ALL
1369      ASEL,S,AREA,,17,26,1
1370      NSLA,S,1,
1371      DDELE,ALL,TEMP,
1372      ASEL,ALL,
1373      NSEL,ALL,
1374      ASEL,S,AREA,,17,26,1
1375      NSLA,S,1,
1376      D,ALL,TEMP,(DFSID(TM)),
1377      ASEL,ALL,
1378      NSEL,ALL,
1379      SOLVE
1380 *ENDDO
1381 /COM,   NSUBST,17,40,15,ON
1382 /COM,   Apply loads and solve for 10 to 90 years
1383 *DO,TM,TME10,TME90,TM110
1384      TIME,TM,
1385      VSEL,S,MAT,,5,
1386      ESLV,S,
1387      BFE,ALL,HGEN,,(FUEL(TM)),
1388      VSEL,ALL
1389      ESEL,ALL
1390      ASEL,S,AREA,,17,26,1
1391      NSLA,S,1,
1392      DDELE,ALL,TEMP,
1393      ASEL,ALL,
1394      NSEL,ALL,
1395      ASEL,S,AREA,,17,26,1
1396      NSLA,S,1,
1397      D,ALL,TEMP,(DFSID(TM)),
1398      ASEL,ALL,
1399      NSEL,ALL,
1400      SOLVE
1401 *ENDDO
1402 /COM,   NSUBST,22,60,20,ON
1403 /COM,   Apply loads and solve for 100 to 1000 years
1404 *DO,TM,TME100,TME1000,TM1100
1405      TIME,TM,
1406      VSEL,S,MAT,,5,
1407      ESLV,S,
1408      BFE,ALL,HGEN,,(FUEL(TM)),
1409      VSEL,ALL
1410      ESEL,ALL
1411      ASEL,S,AREA,,17,26,1
1412      NSLA,S,1,
1413      DDELE,ALL,TEMP,
1414      ASEL,ALL,
1415      NSEL,ALL,
1416      ASEL,S,AREA,,17,26,1
1417      NSLA,S,1,
1418      D,ALL,TEMP,(DFSID(TM)),

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1419      ASEL,ALL,
1420      NSEL,ALL,
1421      SOLVE
1422 *ENDDO
1423 FINISH
1424 /COM, *****
1425 /COM,      Create element contour plots of solution results
1426 /COM,
1427 /COM,      Sort through solution results for time of max temp.
1428 /POST26,
1429 NSOL,2,(NODE((DRMOR+DRMOF),(-1.0*(DRMOR+DRMOF)),(-0.66*BTPT4))),TEMP,,peakgl,
1430 STORE,NEW,
1431 *GET,TMTMAX,VARI,2,EXTREM,TMAX,
1432 FINISH
1433 /POST1,
1434 /COM,      Create temperature contour plots of WP at peak
1435 /RESET,
1436 /TYPE,,HIDP,
1437 /VIEW,1,1,1,1,
1438 /DIST,1,3,0,
1439 /NUM, 1,
1440 /GLINE,,-1,
1441 /TRIAD,OFF,
1442 /PNUM,MAT, 1,
1443 VSEL,S,MAT,,1,5,4
1444 CSYS,31,
1445 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1446 VSEL,U,LOC,Y,-45.0,135.0,
1447 CSYS,0,
1448 ESLV,S
1449 VSEL,S,MAT,,1,5,4
1450 CSYS,32,
1451 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1452 VSEL,U,LOC,Y,-45.0,45.0,
1453 CSYS,0,
1454 ESLV,A
1455 VSEL,S,LOC,X,-100.0,0.0,
1456 ESLV,A
1457 ASEL,S,AREA,,17,26,1
1458 ASEL,R,LOC,X,-100.0,0.0,
1459 ESLA,A
1460 SET,NEAR,,,,TMTMAX,
1461 /TITLE, DHLW WP at Time of Peak Temp. (%TMTMAX/3.15576E7% years)
1462 /SHOW,solupk,grph,0,8,
1463 /CONTOUR,1,128,AUTO,
1464 PLNSOL,TEMP,
1465 /COM,      Create temperature contour plots at 5, 10, 50, and 100 yrs
1466 SET,NEAR,,,,(TM_START+(5*TMI1)),
1467 /TITLE, DHLW WP at 5 years
1468 /SHOW,solu5,grph,0,8,
1469 /CONTOUR,1,128,USER,
1470 PLNSOL,TEMP,
1471 SET,NEAR,,,,TME10,
1472 /TITLE, DHLW WP at 10 years
1473 /SHOW,solu10,grph,0,8,
1474 /CONTOUR,1,128,USER,
1475 PLNSOL,TEMP,
1476 SET,NEAR,,,,TME50,
1477 /TITLE, DHLW WP at 50 years
1478 /SHOW,solu50,grph,0,8,
1479 /CONTOUR,1,128,USER,
1480 PLNSOL,TEMP,
1481 SET,NEAR,,,,TME100,
1482 /TITLE, DHLW WP at 100 years
1483 /SHOW,solu100,grph,0,8,
1484 /CONTOUR,1,128,USER,
1485 PLNSOL,TEMP,
1486 ESEL,ALL,
1487 FINISH
1488 /COM, *****

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1489 /COM,          Print time/temperature output at specific locations
1490 /COM,          Save profile from center to edge
1491 /COM,
1492 /COM,          Variable Legend: A01i000
1493 /COM,          t = structural stainless Canister near center line
1494 /COM,          c = center of Glass log
1495 /COM,          h = halfway between center and Canister
1496 /COM,          s = structural stainless Canister
1497 /COM,          i = inner barrier of DC
1498 /COM,          o = outer barrier of DC
1499 /COM,          ## = cartesian quadrant number of Canister
1500 /COM,          i = side of assembly toward center of WP
1501 /COM,          o = side of assembly toward edge of WP
1502 /COM,          045 = profile 45 deg down
1503 /COM,          135 = profile 45 deg up
1504 /POST26,
1505 NUMVAR,32,
1506 /COM,          *****
1507 /COM,          *Temperature Profile from center to lower right (45 deg.) z=2/3*
1508 /COM,          *****
1509 NSOL, 2,(NODE(TCO45,      (-1.0*TCO45),(-0.33*BTPT4))),TEMP,,t94i045,
1510 NSOL, 3,(NODE(TCI45,      (-1.0*TCI45),(-0.33*BTPT4))),TEMP,,t94o045,
1511 NSOL, 4,(NODE(HCI45,      (-1.0*HCI45),(-0.33*BTPT4))),TEMP,,h94i045,
1512 NSOL, 5,(NODE(CCO45,      (-1.0*CCO45),(-0.33*BTPT4))),TEMP,,c94i045,
1513 NSOL, 6,(NODE(HCO45,      (-1.0*HCO45),(-0.33*BTPT4))),TEMP,,h94o045,
1514 NSOL, 7,(NODE(SCI45,      (-1.0*SCI45),(-0.33*BTPT4))),TEMP,,s94i045,
1515 NSOL, 8,(NODE(SCO45,      (-1.0*SCO45),(-0.33*BTPT4))),TEMP,,s94o045,
1516 NSOL, 9,(NODE(MI45,       (-1.0*MI45),(-0.33*BTPT4))),TEMP,,i94i045,
1517 NSOL,10,(NODE(MO45,       (-1.0*MO45),(-0.33*BTPT4))),TEMP,,i94o045,
1518 NSOL,11,(NODE(DO45,       (-1.0*DO45),(-0.33*BTPT4))),TEMP,,o94o045,
1519 PRVAR, 2, 3, 4, 5, 6, 7,
1520 PRVAR, 8, 9,10,11,
1521 /COM,          *****
1522 /COM,          * Temperature Profile from center to lower right (45 deg.) *
1523 /COM,          *****
1524 NSOL, 2,(NODE(TCO45,      (-1.0*TCO45),0.0)),TEMP,,t04i045,
1525 NSOL, 3,(NODE(TCI45,      (-1.0*TCI45),0.0)),TEMP,,t04o045,
1526 NSOL, 4,(NODE(HCI45,      (-1.0*HCI45),0.0)),TEMP,,h04i045,
1527 NSOL, 5,(NODE(CCO45,      (-1.0*CCO45),0.0)),TEMP,,c04i045,
1528 NSOL, 6,(NODE(HCO45,      (-1.0*HCO45),0.0)),TEMP,,h04o045,
1529 NSOL, 7,(NODE(SCI45,      (-1.0*SCI45),0.0)),TEMP,,s04i045,
1530 NSOL, 8,(NODE(SCO45,      (-1.0*SCO45),0.0)),TEMP,,s04o045,
1531 NSOL, 9,(NODE(MI45,       (-1.0*MI45),0.0)),TEMP,,i04i045,
1532 NSOL,10,(NODE(MO45,       (-1.0*MO45),0.0)),TEMP,,i04o045,
1533 NSOL,11,(NODE(DO45,       (-1.0*DO45),0.0)),TEMP,,o04o045,
1534 PRVAR, 2, 3, 4, 5, 6, 7,
1535 PRVAR, 8, 9,10,11,
1536 /COM,
1537 /COM,          *****
1538 /COM,          * Temperature Profile from center to upper right (135 deg.) *
1539 /COM,          *****
1540 NSOL, 2,(NODE(TCO45,      TCO45,0.0)),TEMP,,t01i135,
1541 NSOL, 3,(NODE(TCI45,      TCI45,0.0)),TEMP,,t01o135,
1542 NSOL, 4,(NODE(HCI45,      HCI45,0.0)),TEMP,,h01i135,
1543 NSOL, 5,(NODE(CCO45,      CCO45,0.0)),TEMP,,c01i135,
1544 NSOL, 6,(NODE(HCO45,      HCO45,0.0)),TEMP,,h01o135,
1545 NSOL, 7,(NODE(SCI45,      SCI45,0.0)),TEMP,,s01i135,
1546 NSOL, 8,(NODE(SCO45,      SCO45,0.0)),TEMP,,s01o135,
1547 NSOL, 9,(NODE(MI45,       MI45,0.0)),TEMP,,i01i135,
1548 NSOL,10,(NODE(MO45,       MO45,0.0)),TEMP,,i01o135,
1549 NSOL,11,(NODE(DO45,       DO45,0.0)),TEMP,,o01o135,
1550 PRVAR, 2, 3, 4, 5, 6, 7,
1551 PRVAR, 8, 9,10,11,
1552 /COM,
1553 /COM,          *****
1554 /COM,          * Temp. Prof. from center to lower right (45 deg.) z=glass bot *
1555 /COM,          *****
1556 NSOL, 2,(NODE(TCO45,      (-1.0*TCO45),(-1*BTPT4))),TEMP,,tb4i045,
1557 NSOL, 3,(NODE(TCI45,      (-1.0*TCI45),(-1*BTPT4))),TEMP,,tb4o045,
1558 NSOL, 4,(NODE(HCI45,      (-1.0*HCI45),(-1*BTPT4))),TEMP,,hb4i045,

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1559 NSOL, 5, (NODE( CCO45, (-1.0*CCO45), (-1*BTPT4))), TEMP, ,cb4i045,
1560 NSOL, 6, (NODE( HCO45, (-1.0*HCO45), (-1*BTPT4))), TEMP, ,hb4o045,
1561 NSOL, 7, (NODE( SCI45, (-1.0*SCI45), (-1*BTPT4))), TEMP, ,sb4i045,
1562 NSOL, 8, (NODE( SCO45, (-1.0*SCO45), (-1*BTPT4))), TEMP, ,sb4o045,
1563 NSOL, 9, (NODE( MI45, (-1.0*MI45), (-1*BTPT4))), TEMP, ,ib4i045,
1564 NSOL, 10, (NODE( MO45, (-1.0*MO45), (-1*BTPT4))), TEMP, ,ib4o045,
1565 NSOL, 11, (NODE( DO45, (-1.0*DO45), (-1*BTPT4))), TEMP, ,ob4o045,
1566 PRVAR, 2, 3, 4, 5, 6, 7,
1567 PRVAR, 8, 9, 10, 11,
1568 /COM,
1569 /COM,
1570 /COM, * Temp. Prof. from center to upper right (135 deg.) z=glass bot*
1571 /COM,
1572 NSOL, 2, (NODE( TCO45, TCO45, (-1*BTPT4))), TEMP, ,t01i135,
1573 NSOL, 3, (NODE( TCI45, TCI45, (-1*BTPT4))), TEMP, ,t01o135,
1574 NSOL, 4, (NODE( HCI45, HCI45, (-1*BTPT4))), TEMP, ,h01i135,
1575 NSOL, 5, (NODE( CCO45, CCO45, (-1*BTPT4))), TEMP, ,c01i135,
1576 NSOL, 6, (NODE( HCO45, HCO45, (-1*BTPT4))), TEMP, ,h01o135,
1577 NSOL, 7, (NODE( SCI45, SCI45, (-1*BTPT4))), TEMP, ,s01i135,
1578 NSOL, 8, (NODE( SCO45, SCO45, (-1*BTPT4))), TEMP, ,s01o135,
1579 NSOL, 9, (NODE( MI45, MI45, (-1*BTPT4))), TEMP, ,i01i135,
1580 NSOL, 10, (NODE( MO45, MO45, (-1*BTPT4))), TEMP, ,i01o135,
1581 NSOL, 11, (NODE( DO45, DO45, (-1*BTPT4))), TEMP, ,o01o135,
1582 PRVAR, 2, 3, 4, 5, 6, 7,
1583 PRVAR, 8, 9, 10, 11,
1584 /COM,
1585 /COM,
1586 /COM, * Temp. Prof. from center to lower right (45 deg.) z=glass top *
1587 /COM,
1588 NSOL, 2, (NODE( TCO45, (-1.0*TCO45), TPPT6)), TEMP, ,tt4i045,
1589 NSOL, 3, (NODE( TCI45, (-1.0*TCI45), TPPT6)), TEMP, ,tt4o045,
1590 NSOL, 4, (NODE( HCI45, (-1.0*HCI45), TPPT6)), TEMP, ,ht4i045,
1591 NSOL, 5, (NODE( CCO45, (-1.0*CCO45), TPPT6)), TEMP, ,ct4i045,
1592 NSOL, 6, (NODE( HCO45, (-1.0*HCO45), TPPT6)), TEMP, ,ht4o045,
1593 NSOL, 7, (NODE( SCI45, (-1.0*SCI45), TPPT6)), TEMP, ,st4i045,
1594 NSOL, 8, (NODE( SCO45, (-1.0*SCO45), TPPT6)), TEMP, ,st4o045,
1595 NSOL, 9, (NODE( MI45, (-1.0*MI45), TPPT6)), TEMP, ,it4i045,
1596 NSOL, 10, (NODE( MO45, (-1.0*MO45), TPPT6)), TEMP, ,it4o045,
1597 NSOL, 11, (NODE( DO45, (-1.0*DO45), TPPT6)), TEMP, ,ot4o045,
1598 PRVAR, 2, 3, 4, 5, 6, 7,
1599 PRVAR, 8, 9, 10, 11,
1600 /COM,
1601 /COM,
1602 /COM, * Temp. Prof. from center to upper right (135 deg.) z=glass top*
1603 /COM,
1604 NSOL, 2, (NODE( TCO45, TCO45, TPPT6)), TEMP, ,t01i135,
1605 NSOL, 3, (NODE( TCI45, TCI45, TPPT6)), TEMP, ,t01o135,
1606 NSOL, 4, (NODE( HCI45, HCI45, TPPT6)), TEMP, ,h01i135,
1607 NSOL, 5, (NODE( CCO45, CCO45, TPPT6)), TEMP, ,c01i135,
1608 NSOL, 6, (NODE( HCO45, HCO45, TPPT6)), TEMP, ,h01o135,
1609 NSOL, 7, (NODE( SCI45, SCI45, TPPT6)), TEMP, ,s01i135,
1610 NSOL, 8, (NODE( SCO45, SCO45, TPPT6)), TEMP, ,s01o135,
1611 NSOL, 9, (NODE( MI45, MI45, TPPT6)), TEMP, ,i01i135,
1612 NSOL, 10, (NODE( MO45, MO45, TPPT6)), TEMP, ,i01o135,
1613 NSOL, 11, (NODE( DO45, DO45, TPPT6)), TEMP, ,o01o135,
1614 PRVAR, 2, 3, 4, 5, 6, 7,
1615 PRVAR, 8, 9, 10, 11,
1616 /COM,
1617 /COM,
1618 /COM, * Can. Center Line Temperature Profile in Quad 1 WP Top to Bot *
1619 /COM,
1620 NSOL, 2, (NODE( CCO45, CCO45, MIDPT)), TEMP, ,ot1o135,
1621 NSOL, 3, (NODE( CCO45, CCO45, TPPT1)), TEMP, ,ot1i135,
1622 NSOL, 4, (NODE( CCO45, CCO45, TPPT2)), TEMP, ,it1o135,
1623 NSOL, 5, (NODE( CCO45, CCO45, TPPT3)), TEMP, ,it1i135,
1624 NSOL, 6, (NODE( CCO45, CCO45, TPPT4)), TEMP, ,st1o135,
1625 NSOL, 7, (NODE( CCO45, CCO45, TPPT5)), TEMP, ,st1i135,
1626 NSOL, 8, (NODE( CCO45, CCO45, TPPT6)), TEMP, ,ht1i135,
1627 NSOL, 9, (NODE( CCO45, CCO45, (0.5*TPPT6))), TEMP, ,gt1i135,
1628 NSOL, 10, (NODE( CCO45, CCO45, 0.0)), TEMP, ,c01i135,

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1629 NSOL,11,(NODE(      CCO45,      CCO45,      (-0.33*BTPT4))),TEMP,,gb1i135,
1630 NSOL,12,(NODE(      CCO45,      CCO45,      (-0.66*BTPT4))),TEMP,,gb1h135,
1631 NSOL,13,(NODE(      CCO45,      CCO45,      (-1.0*BTPT4))),TEMP,,sb1i135,
1632 NSOL,14,(NODE(      CCO45,      CCO45,      (-1.0*BTPT3))),TEMP,,sb1o135,
1633 NSOL,15,(NODE(      CCO45,      CCO45,      (-1.0*BTPT2))),TEMP,,ib1i135,
1634 NSOL,16,(NODE(      CCO45,      CCO45,      (-1.0*BTPT1))),TEMP,,ib1o135,
1635 NSOL,17,(NODE(      CCO45,      CCO45,      MIDPT)),TEMP,,ob1o135,
1636 PRVAR, 2, 3, 4, 5, 6, 7,
1637 PRVAR, 8, 9,10,11,12,13,
1638 PRVAR,14,15,16,17,
1639 /COM,
1640 /COM, *****
1641 /COM, * Can. Center Line Temperature Profile in Quad 4 WP Top to Bot *
1642 /COM, *****
1643 NSOL, 2,(NODE(      CCO45,(-1.0*CCO45),      MIDPT)),TEMP,,ot4o045,
1644 NSOL, 3,(NODE(      CCO45,(-1.0*CCO45),      TPPT1)),TEMP,,ot4i045,
1645 NSOL, 4,(NODE(      CCO45,(-1.0*CCO45),      TPPT2)),TEMP,,it4o045,
1646 NSOL, 5,(NODE(      CCO45,(-1.0*CCO45),      TPPT3)),TEMP,,it4i045,
1647 NSOL, 6,(NODE(      CCO45,(-1.0*CCO45),      TPPT4)),TEMP,,st4o045,
1648 NSOL, 7,(NODE(      CCO45,(-1.0*CCO45),      TPPT5)),TEMP,,st4i045,
1649 NSOL, 8,(NODE(      CCO45,(-1.0*CCO45),      TPPT6)),TEMP,,ht4i045,
1650 NSOL, 9,(NODE(      CCO45,(-1.0*CCO45),      ( 0.5*TPPT6))),TEMP,,gt4i045,
1651 NSOL,10,(NODE(      CCO45,(-1.0*CCO45),      0.0)),TEMP,,c04i045,
1652 NSOL,11,(NODE(      CCO45,(-1.0*CCO45),      (-0.33*BTPT4))),TEMP,,gb4i045,
1653 NSOL,12,(NODE(      CCO45,(-1.0*CCO45),      (-0.66*BTPT4))),TEMP,,gb4h045,
1654 NSOL,13,(NODE(      CCO45,(-1.0*CCO45),      (-1.0*BTPT4))),TEMP,,sb4i045,
1655 NSOL,14,(NODE(      CCO45,(-1.0*CCO45),      (-1.0*BTPT3))),TEMP,,sb4o045,
1656 NSOL,15,(NODE(      CCO45,(-1.0*CCO45),      (-1.0*BTPT2))),TEMP,,ib4i045,
1657 NSOL,16,(NODE(      CCO45,(-1.0*CCO45),      (-1.0*BTPT1))),TEMP,,ib4o045,
1658 NSOL,17,(NODE(      CCO45,(-1.0*CCO45),      MIDPT)),TEMP,,ob4o045,
1659 PRVAR, 2, 3, 4, 5, 6, 7,
1660 PRVAR, 8, 9,10,11,12,13,
1661 PRVAR,14,15,16,17,
1662 /COM,
1663 /COM, *****
1664 /COM, * Can. Inner Surface Temperature Prof. in Quad 1 WP Top - Bot *
1665 /COM, *****
1666 NSOL, 2,(NODE(      TCO45,      TCO45,      MIDPT)),TEMP,,ot1o1se,
1667 NSOL, 3,(NODE(      TCO45,      TCO45,      TPPT1)),TEMP,,ot1i1se,
1668 NSOL, 4,(NODE(      TCO45,      TCO45,      TPPT2)),TEMP,,it1o1se,
1669 NSOL, 5,(NODE(      TCO45,      TCO45,      TPPT3)),TEMP,,it1i1se,
1670 NSOL, 6,(NODE(      TCO45,      TCO45,      TPPT4)),TEMP,,st1o1se,
1671 NSOL, 7,(NODE(      TCO45,      TCO45,      TPPT5)),TEMP,,st1i1se,
1672 NSOL, 8,(NODE(      TCO45,      TCO45,      TPPT6)),TEMP,,ht1i1se,
1673 NSOL, 9,(NODE(      TCO45,      TCO45,      ( 0.5*TPPT6))),TEMP,,gt1i1se,
1674 NSOL,10,(NODE(      TCO45,      TCO45,      0.0)),TEMP,,c01i1se,
1675 NSOL,11,(NODE(      TCO45,      TCO45,      (-0.33*BTPT4))),TEMP,,gb1i1se,
1676 NSOL,12,(NODE(      TCO45,      TCO45,      (-0.66*BTPT4))),TEMP,,gb1h1se,
1677 NSOL,13,(NODE(      TCO45,      TCO45,      (-1.0*BTPT4))),TEMP,,sb1i1se,
1678 NSOL,14,(NODE(      TCO45,      TCO45,      (-1.0*BTPT3))),TEMP,,sb1o1se,
1679 NSOL,15,(NODE(      TCO45,      TCO45,      (-1.0*BTPT2))),TEMP,,ib1i1se,
1680 NSOL,16,(NODE(      TCO45,      TCO45,      (-1.0*BTPT1))),TEMP,,ib1o1se,
1681 NSOL,17,(NODE(      TCO45,      TCO45,      MIDPT)),TEMP,,ob1o1se,
1682 PRVAR, 2, 3, 4, 5, 6, 7,
1683 PRVAR, 8, 9,10,11,12,13,
1684 PRVAR,14,15,16,17,
1685 /COM,
1686 /COM, *****
1687 /COM, * Can. Outer Surface Temperature Prof. in Quad 1 WP Top - Bot *
1688 /COM, *****
1689 NSOL, 2,(NODE(      SCO45,      SCO45,      MIDPT)),TEMP,,ot1oose,
1690 NSOL, 3,(NODE(      SCO45,      SCO45,      TPPT1)),TEMP,,ot1iose,
1691 NSOL, 4,(NODE(      SCO45,      SCO45,      TPPT2)),TEMP,,it1oose,
1692 NSOL, 5,(NODE(      SCO45,      SCO45,      TPPT3)),TEMP,,it1iose,
1693 NSOL, 6,(NODE(      SCO45,      SCO45,      TPPT4)),TEMP,,st1oose,
1694 NSOL, 7,(NODE(      SCO45,      SCO45,      TPPT5)),TEMP,,st1iose,
1695 NSOL, 8,(NODE(      SCO45,      SCO45,      TPPT6)),TEMP,,ht1iose,
1696 NSOL, 9,(NODE(      SCO45,      SCO45,      ( 0.5*TPPT6))),TEMP,,gt1iose,
1697 NSOL,10,(NODE(      SCO45,      SCO45,      0.0)),TEMP,,c01iose,
1698 NSOL,11,(NODE(      SCO45,      SCO45,      (-0.33*BTPT4))),TEMP,,gb1iose,

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```

1699 NSOL,12,(NODE(      SCO45,      SCO45,      (-0.66*BTPT4))),TEMP,,gb1hose,
1700 NSOL,13,(NODE(      SCO45,      SCO45,      (-1.0*BTPT4))),TEMP,,sb1iose,
1701 NSOL,14,(NODE(      SCO45,      SCO45,      (-1.0*BTPT3))),TEMP,,sb1oose,
1702 NSOL,15,(NODE(      SCO45,      SCO45,      (-1.0*BTPT2))),TEMP,,ib1iose,
1703 NSOL,16,(NODE(      SCO45,      SCO45,      (-1.0*BTPT1))),TEMP,,ib1oose,
1704 NSOL,17,(NODE(      SCO45,      SCO45,      MIDPT)),TEMP,,ob1oose,
1705 PRVAR, 2, 3, 4, 5, 6, 7,
1706 PRVAR, 8, 9,10,11,12,13,
1707 PRVAR,14,15,16,17,
1708 /COM,
1709 /COM,
1710 /COM, * Can. Inner Surface Temperature Prof. in Quad 4 WP Top - Bot *
1711 /COM,
1712 NSOL, 2,(NODE(      TCO45,(-1.0*TCO45),      MIDPT)),TEMP,,ot4oise,
1713 NSOL, 3,(NODE(      TCO45,(-1.0*TCO45),      TPPT1)),TEMP,,ot4iise,
1714 NSOL, 4,(NODE(      TCO45,(-1.0*TCO45),      TPPT2)),TEMP,,it4oise,
1715 NSOL, 5,(NODE(      TCO45,(-1.0*TCO45),      TPPT3)),TEMP,,it4iise,
1716 NSOL, 6,(NODE(      TCO45,(-1.0*TCO45),      TPPT4)),TEMP,,st4oise,
1717 NSOL, 7,(NODE(      TCO45,(-1.0*TCO45),      TPPT5)),TEMP,,st4iise,
1718 NSOL, 8,(NODE(      TCO45,(-1.0*TCO45),      TPPT6)),TEMP,,ht4iise,
1719 NSOL, 9,(NODE(      TCO45,(-1.0*TCO45),      ( 0.5*TPPT6))),TEMP,,gt4iise,
1720 NSOL,10,(NODE(      TCO45,(-1.0*TCO45),      0.0)),TEMP,,c04iise,
1721 NSOL,11,(NODE(      TCO45,(-1.0*TCO45),      (-0.33*BTPT4))),TEMP,,gb4iise,
1722 NSOL,12,(NODE(      TCO45,(-1.0*TCO45),      (-0.66*BTPT4))),TEMP,,gb4hise,
1723 NSOL,13,(NODE(      TCO45,(-1.0*TCO45),      (-1.0*BTPT4))),TEMP,,sb4iise,
1724 NSOL,14,(NODE(      TCO45,(-1.0*TCO45),      (-1.0*BTPT3))),TEMP,,sb4oise,
1725 NSOL,15,(NODE(      TCO45,(-1.0*TCO45),      (-1.0*BTPT2))),TEMP,,ib4iise,
1726 NSOL,16,(NODE(      TCO45,(-1.0*TCO45),      (-1.0*BTPT1))),TEMP,,ib4oise,
1727 NSOL,17,(NODE(      TCO45,(-1.0*TCO45),      MIDPT)),TEMP,,ob4oise,
1728 PRVAR, 2, 3, 4, 5, 6, 7,
1729 PRVAR, 8, 9,10,11,12,13,
1730 PRVAR,14,15,16,17,
1731 /COM,
1732 /COM,
1733 /COM, * Can. Outer Surface Temperature Prof. in Quad 4 WP Top - Bot *
1734 /COM,
1735 NSOL, 2,(NODE(      SCO45,(-1.0*SCO45),      MIDPT)),TEMP,,ot4oose,
1736 NSOL, 3,(NODE(      SCO45,(-1.0*SCO45),      TPPT1)),TEMP,,ot4iose,
1737 NSOL, 4,(NODE(      SCO45,(-1.0*SCO45),      TPPT2)),TEMP,,it4oose,
1738 NSOL, 5,(NODE(      SCO45,(-1.0*SCO45),      TPPT3)),TEMP,,it4iose,
1739 NSOL, 6,(NODE(      SCO45,(-1.0*SCO45),      TPPT4)),TEMP,,st4oose,
1740 NSOL, 7,(NODE(      SCO45,(-1.0*SCO45),      TPPT5)),TEMP,,st4iose,
1741 NSOL, 8,(NODE(      SCO45,(-1.0*SCO45),      TPPT6)),TEMP,,ht4iose,
1742 NSOL, 9,(NODE(      SCO45,(-1.0*SCO45),      ( 0.5*TPPT6))),TEMP,,gt4iose,
1743 NSOL,10,(NODE(      SCO45,(-1.0*SCO45),      0.0)),TEMP,,c04iose,
1744 NSOL,11,(NODE(      SCO45,(-1.0*SCO45),      (-0.33*BTPT4))),TEMP,,gb4iose,
1745 NSOL,12,(NODE(      SCO45,(-1.0*SCO45),      (-0.66*BTPT4))),TEMP,,gb4hose,
1746 NSOL,13,(NODE(      SCO45,(-1.0*SCO45),      (-1.0*BTPT4))),TEMP,,sb4iose,
1747 NSOL,14,(NODE(      SCO45,(-1.0*SCO45),      (-1.0*BTPT3))),TEMP,,sb4oose,
1748 NSOL,15,(NODE(      SCO45,(-1.0*SCO45),      (-1.0*BTPT2))),TEMP,,ib4iose,
1749 NSOL,16,(NODE(      SCO45,(-1.0*SCO45),      (-1.0*BTPT1))),TEMP,,ib4oose,
1750 NSOL,17,(NODE(      SCO45,(-1.0*SCO45),      MIDPT)),TEMP,,ob4oose,
1751 PRVAR, 2, 3, 4, 5, 6, 7,
1752 PRVAR, 8, 9,10,11,12,13,
1753 PRVAR,14,15,16,17,
1754 /COM,
1755 /COM,
1756 /COM, * WP Outer Surface Temperature Prof. at 90 deg. WP Top - Bot *
1757 /COM,
1758 NSOL, 2,(NODE(      DCORD,0.0,      MIDPT)),TEMP,,otwoose,
1759 NSOL, 3,(NODE(      DCORD,0.0,      TPPT1)),TEMP,,otwiiose,
1760 NSOL, 4,(NODE(      DCORD,0.0,      TPPT2)),TEMP,,itwoose,
1761 NSOL, 5,(NODE(      DCORD,0.0,      TPPT3)),TEMP,,itwiiose,
1762 NSOL, 6,(NODE(      DCORD,0.0,      TPPT4)),TEMP,,stwoose,
1763 NSOL, 7,(NODE(      DCORD,0.0,      TPPT5)),TEMP,,stwiiose,
1764 NSOL, 8,(NODE(      DCORD,0.0,      TPPT6)),TEMP,,htwiiose,
1765 NSOL, 9,(NODE(      DCORD,0.0,      ( 0.5*TPPT6))),TEMP,,gtwiiose,
1766 NSOL,10,(NODE(      DCORD,0.0,      0.0)),TEMP,,c0wiiose,
1767 NSOL,11,(NODE(      DCORD,0.0,      (-0.33*BTPT4))),TEMP,,gbwiiose,
1768 NSOL,12,(NODE(      DCORD,0.0,      (-0.66*BTPT4))),TEMP,,gbwoose,

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1769 NSOL,13,(NODE( DCORD,0.0, (-1.0*BTPT4))),TEMP,,sbwiose,
1770 NSOL,14,(NODE( DCORD,0.0, (-1.0*BTPT3))),TEMP,,sbwoose,
1771 NSOL,15,(NODE( DCORD,0.0, (-1.0*BTPT2))),TEMP,,ibwiose,
1772 NSOL,16,(NODE( DCORD,0.0, (-1.0*BTPT1))),TEMP,,ibwoose,
1773 NSOL,17,(NODE( DCORD,0.0, MIDPT)),TEMP,,obwoose,
1774 PRVAR, 2, 3, 4, 5, 6, 7,
1775 PRVAR, 8, 9,10,11,12,13,
1776 PRVAR,14,15,16,17,
1777 FINISH
1778 /COM, *****
1779 /COM, End of batch input file
1780 /COM, *****
1781 SAVE,
1782 /EXIT,
1783 /EOF

```

RUN SETUP PROCEDURE FROM FILE= /ansys50a/docu/start.ans

```

/INPUT FILE= /ansys50a/docu/start.ans LINE= 0
*****
ANSYS STARTUP FILE start.ans
*****

```

```

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= INP     /input,,inp,
ABBREVIATION= X3D     /show,3d,
ABBREVIATION= X11     /show,x11,
ABBREVIATION= VEC     /show,,,1,

```

ABBREVIATION= RAS /show,,,0,
 ABBREVIATION= ON /menu,on,
 ABBREVIATION= OFF /menu,off,
 ABBREVIATION= NVP /config,nvpag,512,
 ABBREVIATION= QUIT /exit,nosav,
 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

type: on

 ANSYS REVISION 5.0A 05/23/1995
 3-D Model of Pu Disp. Glass WP for MGDS Disposal Thomas L Lotz

 * *
 * File name: glsp21x2.inp *
 * 4 Pack Glass WP Form w/ C71500 Outer Barrier D. Container *
 * No Helium Fill Gas - WP placed at mid point between SNF WP *
 * *
 * Material Property file: propsd1.dat *
 * *
 * SNF Conductivity file: TBD (NOT REQUIRED) *
 * *
 * *
 * SNF Heat Loads file: pusgls2.dat *
 * Initial Heat Load: 853 W/canister *
 * *
 * Surface Temp. file: c21x5a.parm *
 * 100 MTU/acre (24.7 kgU/m^2) AML (High Thermal Loading) *
 * 5.0 m Diameter Drift with Concrete Invert *
 * Drift spacing = 22.5 m *
 * WP c/c spacing = 16.165 m *
 * *

 Increase the number of database pages from 16 (256) to 32 Mb
 DONT DO: /CONFIG,nvpag,512,
 Work space must also be increased (-m 87) For Radiation Matix

TITLE=
 DHLW Glass Form Waste Package

SI UNITS SPECIFIED
 LENGTH = METERS(M)
 MASS = KILOGRAMS(KG)
 TIME = SECONDS(SEC)
 TEMPERATURE = CENTIGRADE
 CURRENT = AMPS

 Read in average effective conductivities from SNF model
 No Need for File: PARRES,CHANGE,pwr15e,parm,
 Read in surface temps. from repository model

*** NOTE *** CP= .710 TIME= 10:44:58
Restore ANSYS parameters from file= c21x5a.parm.

/INPUT FILE= c21x5a.parm LINE= 0

PRINTOUT RESUMED BY /GOP

Define Transient time parameters (AS PER THE PARAM FILE)

TM_START = start time (sec)

TMI* = time increment for solution (sec)

TME* = start and stop for time do-loops (sec)

Note: 1 year = 3.15576e7 seconds

TMTMAX = time of maximum cladding temperature

TM_START=(1.0E-6)*(3.15576E7)

TMI0=0.1*3.15576E7

TMI1=1.0*3.15576E7

TMI10=10.0*3.15576E7

TMI100=100.0*3.15576E7

TMI1000=1000.0*3.15576E7

TME0=0.9*3.15576E7+TM_START

TME1=TMI1+TM_START

TME9=9.0*3.15576E7+TM_START

TME10=TMI10+TM_START

TME50=50.0*3.15576E7+TM_START

TME90=90.0*3.15576E7+TM_START

TME100=TMI100+TM_START

TME1000=TMI1000+TM_START

Define waste package parameters

Required Constants:

PARAMETER PI = 3.141593

PARAMETER SQT = 1.414214

Define emplacement parameters

DFRAD = radius of drift (m)

INVRT = height of invert backfill floor (m)

WPSPC = waste package c/c spacing (m)

OFFST = WP center below drift center (m)

XXX = X coordinate of invert drift wall intersection

YYY = Y coordinate of invert drift wall intersection

PARAMETER DFRAD = 2.500000

PARAMETER INVRT = .7000000

PARAMETER WPSPC = 16.16500

PARAMETER OFFST = .1833000

PARAMETER XXX = 1.734935

PARAMETER YYY = -1.616700

Required container wall parameters:

DCIRD = disposal container inner radius (m)

OWALL = outer barrier thickness (m)

IWALL = inner barrier thickness (m)

DCORD = disposal container outer radius (m)

DCLEN = Disp. Cont. outside length

DCOLT = Disp. Cont. Outer Lid Thickness (m)

DCILT = Disp. Cont. Inner Lid Thickness (m)

DCIOG = Disp. Cont. Inner/Outer Lid Gap at top of WP (m)

DCILN = Disp. Cont. Inner Bar. Total length (m)

DCILI = Disp. Cont. Inner Bar. Inner length (m)

PARAMETER DCIRD = .7845000

PARAMETER OWALL = .5000000E-01
 PARAMETER IWALL = .2000000E-01
 PARAMETER DCORD = .8545000
 PARAMETER DCLEN = 3.230000
 PARAMETER DCOLT = .5500000E-01
 PARAMETER DCILT = .2500000E-01
 PARAMETER DCIOG = .3000000E-01
 PARAMETER DCILN = 3.090000
 PARAMETER DCILI = 3.040000

Required ceramic and drum parameters:

CDRAD = glass radius (m)
 CDHGT = glass hieght; hieght of fill (m)
 DRMIR = SRP Canister inner rad. (m)
 DRMOR = SRP Canister drum outer rad. (m)
 DRBTT = SRP Canister thickness at bottom of Canister (m)
 DRTPT = SRP Canister thickness at Top of Canister (m)
 DRLEN = SRP Canister outer length (m)
 DRILN = SRP Canister Inner length (m)
 DRGAP = SRP Canister axial gap with inner barrier at bot
 DRGPT = SRP Canister axial gap with inner barrier at top
 DRMOF = SRP Canister center line off set (m)
 PEAKF = Peaking factor to adjust Heat generation dist.
 FVOLU = can_volume=PI*glass_fill_radiu^2*glass_length

PARAMETER CDRAD = .2953000
 PARAMETER CDHGT = 2.154900
 PARAMETER DRMIR = .2953000
 PARAMETER DRMOR = .3048000
 PARAMETER DRBTT = .1500000E-01
 PARAMETER DRTPT = .2000000E-01
 PARAMETER DRLEN = 2.744600
 PARAMETER DRILN = 2.709600
 PARAMETER DRGAP = .2500000E-01
 PARAMETER DRGPT = .2704000
 PARAMETER DRMOF = .2015054E-01
 PARAMETER PEAKF = 1.000000
 PARAMETER FVOLU = .5903423

Define Extrude Distances as required:
 Bottom of WP

PARAMETER MIDPT = 1.615000
 PARAMETER BTPT1 = 1.560000
 PARAMETER BTPT2 = 1.535000
 PARAMETER BTPT3 = 1.510000

PARAMETER BTPT4 = 1.495000
 Top of WP
 PARAMETER TPPT1 = 1.560000
 PARAMETER TPPT2 = 1.530000
 PARAMETER TPPT3 = 1.505000
 PARAMETER TPPT4 = 1.234600
 PARAMETER TPPT5 = 1.214600
 PARAMETER TPPT6 = .6599000

Define calculated parameters

ASSY = assembly heat production (W) f(yrs)

FUEL = volumetric heat production (W/m3) f(yrs)

ARRAY PARAMETER ASSY DELETED.

SET PARAMETER DIMENSIONS ON ASSY TYPE=TABL DIMENSIONS= 101 1 1

SET PARAMETER DIMENSIONS ON FUEL TYPE=TABL DIMENSIONS= 101 1 1

Define 45 degree point of reference:

TC045 = x coord. WP Center Line Outer Pour Can. at 45 de

TCI45 = x coord. WP Center Line Inner Pour Can. at 45 de

HCI45 = x coord. WP Center Line side of center Glass at

HCO45 = x coord. WP Edge side of center Glass at 45 deg.

CCO45 = x coord. Glass Center Line in Pour Can. at 45 de

SCO45 = x coord. WP Edge Outer Pour Can. at 45 deg.

SCI45 = x coord. WP Edge Inner Pour Can. at 45 deg.

MI45 = x coord. DCIRD at 45 deg.

MO45 = x coord. DCIRD+IWALL at 45 deg.

DO45 = x coord. DCIRD+IWALL+OWALL at 45 deg.

PARAMETER TC045 = .1094244
 PARAMETER TCI45 = .1161419
 PARAMETER HCI45 = .2205462
 PARAMETER HCO45 = .4293549
 PARAMETER CCO45 = .3249505
 PARAMETER SCO45 = .5404767
 PARAMETER SCI45 = .5337592
 PARAMETER MI45 = .5547253
 PARAMETER MO45 = .5688674
 PARAMETER DO45 = .6042227

Define different element types

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****

38303 VERSION=HP 9000/7XX 10:44:58 OCT 28, 1995 CP= 1.460
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

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

ELEMENT TYPE 1 IS PLANE55 2-D THERMAL SOLID
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
TWO-DIMENSIONAL MODEL

ELEMENT TYPE 2 IS SOLID70 3-D THERMAL SOLID
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 6 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 7 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 11 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 16 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 17 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 18 IS MATRIX50 SUBSTRUCTURE MATRIX
KEYOPT(1-12)= 1 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 19 IS LINK31 RADIATION LINK
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 26 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 27 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 36 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 46 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

File props01.dat describes material properties
and thier reference numbers

READ IN MATERIAL PROPERTY LIBRARY FROM FILE= propsd1.dat

/INPUT FILE= propsd1.dat LINE= 0

** ANSYS 5.0 MPC MATERIAL PROPERTY TABLES **

** Filename: propsd1.dat **

** Compiled by T. Lotz on 4-17-95 **

NUMBER	MATERIAL	DESCRIPTION
1	Stainless Steel 316	Pour Canister Material
2	Incaloy 825	Inner Container (resistant)
3	A516 Mild Steel	Outer Container (allowance)
4	Concrete	Concrete used for invert; Track Bed
5	Glass (Pyrex)	Boro-Silicate Glass form
6	TSw2	Drift Wall - Repository Horizon
7	Helium	Canister Fill Gas
8	Air	Alternate Fill Gas
9	Nitrogen	Alternate Fill Gas
10	Argon	Alternate Fill Gas
11	Aluminum 6063	Thermal Conductor
12	Copper	Alternate Thermal Conductor
13	Aluminum-Boron	Aluminum Boron Criticality Matl

** Density: DENS (kg/m^3) **

** Emissivity EMIS **

** Conductivity: KXX (W/m/K) **

** Specific Heat: C (J/kg/K) **

Define densities for all materials except gases
Density of rock (6) is 1.0 because
heat capacitances (J/m^3/K) are entered for C

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 1 ***

SLOC= 1 .0000000E+00

PROPERTY TABLE DENS MAT= 1 NUM. POINTS= 1

SLOC= 1 8000.000

PROPERTY TABLE DENS MAT= 2 NUM. POINTS= 1

SLOC= 1 8137.900

PROPERTY TABLE DENS MAT= 3 NUM. POINTS= 1

SLOC= 1 8131.000

PROPERTY TABLE DENS MAT= 4 NUM. POINTS= 1

SLOC= 1 2300.000

PROPERTY TABLE DENS MAT= 5 NUM. POINTS= 1

SLOC= 1 2225.000

PROPERTY TABLE DENS MAT= 6 NUM. POINTS= 1
SLOC= 1 1.000000

PROPERTY TABLE DENS MAT= 11 NUM. POINTS= 1
SLOC= 1 2690.000

PROPERTY TABLE DENS MAT= 12 NUM. POINTS= 1
SLOC= 1 8933.000

PROPERTY TABLE DENS MAT= 13 NUM. POINTS= 1
SLOC= 1 2693.000

Define emissivities for all materials except gases

PROPERTY TABLE EMIS MAT= 1 NUM. POINTS= 1
SLOC= 1 .6000000

PROPERTY TABLE EMIS MAT= 2 NUM. POINTS= 1
SLOC= 1 .8000000

PROPERTY TABLE EMIS MAT= 3 NUM. POINTS= 1
SLOC= 1 .8000000

PROPERTY TABLE EMIS MAT= 4 NUM. POINTS= 1
SLOC= 1 .8800000

PROPERTY TABLE EMIS MAT= 5 NUM. POINTS= 1
SLOC= 1 .8100000

PROPERTY TABLE EMIS MAT= 6 NUM. POINTS= 1
SLOC= 1 .8500000

PROPERTY TABLE EMIS MAT= 11 NUM. POINTS= 1
SLOC= 1 .7000000E-01

PROPERTY TABLE EMIS MAT= 12 NUM. POINTS= 1
SLOC= 1 .5000000

PROPERTY TABLE EMIS MAT= 13 NUM. POINTS= 1
SLOC= 1 .7000000E-01

Define specific heat for matl. 4, 5, 7, 11, 14, 15

PROPERTY TABLE C MAT= 4 NUM. POINTS= 1
SLOC= 1 880.0000

PROPERTY TABLE C MAT= 5 NUM. POINTS= 1
SLOC= 1 835.0000

PROPERTY TABLE C MAT= 7 NUM. POINTS= 1
SLOC= 1 5193.000

PROPERTY TABLE C MAT= 11 NUM. POINTS= 1
SLOC= 1 900.0000

Define K for material 4, 5, and 6

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 1
SLOC= 1 1.400000

PROPERTY TABLE KXX MAT= 5 NUM. POINTS= 1
SLOC= 1 1.100000

PROPERTY TABLE KXX MAT= 6 NUM. POINTS= 1
SLOC= 1 2.100000

Define K and C for materials 1, 3

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 21.11000 37.78000 65.56000
 93.33000 121.1100 148.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
 SLOC= 7 176.6700 204.4400 232.2200
 260.0000 287.7800 315.5600

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 18 ***
 SLOC= 13 343.3300 371.1100 398.8900
 426.6700 454.4400 482.2200

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 24 ***
 SLOC= 19 510.0000 537.7800 565.5600
 593.3300 621.1100 648.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 30 ***
 SLOC= 25 676.6700 704.4400 732.2200
 760.0000 787.7800 815.5600

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 6
 SLOC= 1 13.33000 13.67000 14.19000 14.54000
 15.06000 15.58000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 12
 SLOC= 7 15.92000 16.44000 16.96000 17.31000
 17.83000 18.17000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 18
 SLOC= 13 18.52000 19.04000 19.38000 19.90000
 20.25000 20.77000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 24
 SLOC= 19 21.11000 21.46000 21.98000 22.33000
 22.67000 23.02000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 30
 SLOC= 25 23.54000 23.88000 24.23000 24.58000
 24.92000 25.27000

PROPERTY TABLE C MAT= 1 NUM. POINTS= 6
 SLOC= 1 481.6800 486.9200 498.0900 499.3800
 509.9800 520.2900

PROPERTY TABLE C MAT= 1 NUM. POINTS= 12
 SLOC= 7 521.0700 527.3800 536.9200 537.3400
 543.0200 543.3100

PROPERTY TABLE C MAT= 1 NUM. POINTS= 18
 SLOC= 13 546.9100 552.1400 552.2600 557.2200
 557.2500 565.1100

PROPERTY TABLE C MAT= 1 NUM. POINTS= 24
 SLOC= 19 565.0100 564.9100 572.3500 572.1400
 574.9200 574.6800

PROPERTY TABLE C MAT= 1 NUM. POINTS= 30
 SLOC= 25 581.6400 581.3000 583.8600 586.3600
 585.9600 588.3900

PROPERTY TABLE KXX MAT= 3 NUM. POINTS= 6
 SLOC= 1 40.84000 41.36000 41.88000 42.23000
 42.23000

PROPERTY TABLE KXX MAT= 3 NUM. POINTS= 12
 SLOC= 7 42.06000 41.88000 41.36000 41.02000
 40.50000 39.98000

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	18	
SLOC= 13	39.29000	38.77000	38.08000	37.56000	
	36.69000	36.17000			

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	24	
SLOC= 19	35.48000	34.61000	33.92000	33.23000	
	32.36000	31.50000			

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	30	
SLOC= 25	30.29000	28.90000	27.35000	26.48000	
	26.13000	26.13000			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	6	
SLOC= 1	428.7200	444.9500	460.9400	476.8700	
	486.0800	495.6600			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	12	
SLOC= 7	506.0900	517.0700	525.6400	536.9900	
	543.6300	550.6200			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	18	
SLOC= 13	562.2100	577.3200	589.1000	600.5700	
	611.3500	629.0900			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	24	
SLOC= 19	645.3200	665.1200	682.0700	694.5200	
	724.0700	761.9500			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	30	
SLOC= 25	806.3100	888.6000	1095.040	1638.780	
	808.6800	736.9000			

Define K for material 2

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	6 ***
SLOC= 1	93.33000	121.1100
	176.6700	204.4400

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	12 ***
SLOC= 7	260.0000	287.7800
	343.3300	371.1100

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	18 ***
SLOC= 13	426.6700	454.4400
	510.0000	537.7800

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	24 ***
SLOC= 19	593.3300	621.1100
	676.6700	704.4400

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	27 ***
SLOC= 25	760.0000	787.7800
		815.5600

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	6	
SLOC= 1	12.29000	12.63000	13.15000	13.67000	
	14.02000	14.54000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	12	
SLOC= 7	14.88000	15.40000	15.75000	16.10000	
	16.61000	16.96000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	18	
SLOC= 13	17.31000	17.65000	18.00000	18.52000	
	18.86000	19.21000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	24	
SLOC= 19	19.73000	20.08000	20.42000	20.94000	

21.46000 21.98000

PROPERTY TABLE KXX MAT= 2 NUM. POINTS= 27
 SLOC= 25 22.33000 23.02000 23.54000

Define C for material 2

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 93.33000 121.1100 148.8900
 176.6700 204.4400 232.2200

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
 SLOC= 7 260.0000 287.7800 315.5600
 343.3300 371.1100 398.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 17 ***
 SLOC= 13 426.6700 454.4400 482.2200
 510.0000 537.7800

PROPERTY TABLE C MAT= 2 NUM. POINTS= 6
 SLOC= 1 460.6900 477.4200 501.0200 504.6500
 498.1200 520.4500

PROPERTY TABLE C MAT= 2 NUM. POINTS= 12
 SLOC= 7 536.8800 559.8500 576.8300 576.2100
 581.6800 598.2000

PROPERTY TABLE C MAT= 2 NUM. POINTS= 17
 SLOC= 13 619.5800 636.7600 654.2000 678.2500
 696.2900

Define C for material 6

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 4 ***
 SLOC= 1 25.00000 50.00000 94.00000
 95.00000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 8 ***
 SLOC= 5 105.0000 114.0000 115.0000
 155.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 11 ***
 SLOC= 9 195.0000 235.0000 275.0000

PROPERTY TABLE C MAT= 6 NUM. POINTS= 4
 SLOC= 1 2032400. 2128000. 2263800. .1076380E+08

PROPERTY TABLE C MAT= 6 NUM. POINTS= 8
 SLOC= 5 .1046900E+08 .1019840E+08 2006500. 2111400.

PROPERTY TABLE C MAT= 6 NUM. POINTS= 11
 SLOC= 9 2191200. 2269200. 2341000.

Define p, K, C for materials 7, 8, 9, ~10

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 -13.15000 6.850000 26.85000
 76.85000 126.8500 176.8500

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
 SLOC= 7 226.8500 276.8500 326.8500

376.8500 426.8500 476.8500

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 15 ***
SLOC= 13 526.8500 626.8500 726.8500

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 6
SLOC= 1 .1875000 .1750000 .1625000 .1422000
 .1219000 .1097000

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 12
SLOC= 7 .9750000E-01 .9060000E-01 .8360000E-01 .7670000E-01
 .6970000E-01 .6620000E-01

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 15
SLOC= 13 .6270000E-01 .5580000E-01 .4880000E-01

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 6
SLOC= 1 .1370000 .1450000 .1520000 .1700000
 .1870000 .2040000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 12
SLOC= 7 .2200000 .2360000 .2520000 .2640000
 .2780000 .2910000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 15
SLOC= 13 .3040000 .3300000 .3540000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 6
SLOC= 1 1.348000 1.254700 1.161400 .9950000
 .8711000 .7740000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 12
SLOC= 7 .6964000 .6329000 .5804000 .5356000
 .4975000 .4643000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 15
SLOC= 13 .4354000 .3868000 .3482000

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 6
SLOC= 1 .2300000E-01 .2500000E-01 .2600000E-01 .3000000E-01
 .3400000E-01 .3700000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 12
SLOC= 7 .4100000E-01 .4400000E-01 .4700000E-01 .5000000E-01
 .5200000E-01 .5500000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 15
SLOC= 13 .5700000E-01 .6200000E-01 .6700000E-01

PROPERTY TABLE C MAT= 8 NUM. POINTS= 6
SLOC= 1 1006.200 1006.600 1007.000 1009.000
 1014.000 1021.000

PROPERTY TABLE C MAT= 8 NUM. POINTS= 12
SLOC= 7 1030.000 1040.000 1051.000 1063.000
 1075.000 1087.000

PROPERTY TABLE C MAT= 8 NUM. POINTS= 15
SLOC= 13 1099.000 1121.000 1141.000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 6
SLOC= 1 1.303700 1.213500 1.123300 .9625000
 .8425000 .7485000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 12
SLOC= 7 .6739000 .6124000 .5615000 .5214000
 .4812000 .4512000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 15

SLOC= 13 .4211000 .3743000 .3368000

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 6
 SLOC= 1 .2300000E-01 .2400000E-01 .2600000E-01 .2900000E-01
 .3300000E-01 .3600000E-01

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 12
 SLOC= 7 .3900000E-01 .4200000E-01 .4500000E-01 .4700000E-01
 .5000000E-01 .5200000E-01

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 15
 SLOC= 13 .5500000E-01 .6000000E-01 .6500000E-01

PROPERTY TABLE C MAT= 9 NUM. POINTS= 6
 SLOC= 1 1041.800 1041.400 1041.000 1042.000
 1045.000 1050.000

PROPERTY TABLE C MAT= 9 NUM. POINTS= 12
 SLOC= 7 1056.000 1065.000 1075.000 1086.500
 1098.000 1159.000

PROPERTY TABLE C MAT= 9 NUM. POINTS= 15
 SLOC= 13 1220.000 1146.000 1167.000

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 6
 SLOC= 1 .1700000E-01 .1700000E-01 .1800000E-01 .2100000E-01
 .2300000E-01 .2500000E-01

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 12
 SLOC= 7 .2700000E-01 .2800000E-01 .3000000E-01 .3200000E-01
 .3400000E-01 .3600000E-01

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 15
 SLOC= 13 .3700000E-01 .4100000E-01 .4400000E-01

Define K and C for material 12

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 -73.15000 26.85000 126.8500
 326.8500 526.8500 726.8500

PROPERTY TABLE KXX MAT= 12 NUM. POINTS= 6
 SLOC= 1 413.0000 401.0000 393.0000 379.0000
 366.0000 352.0000

PROPERTY TABLE C MAT= 12 NUM. POINTS= 6
 SLOC= 1 356.0000 385.0000 397.0000 417.0000
 433.0000 451.0000

Define K and C for material 13

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 5 ***
 SLOC= 1 23.00000 50.00000 100.0000
 150.0000 200.0000

PROPERTY TABLE KXX MAT= 13 NUM. POINTS= 5
 SLOC= 1 182.5600 190.1700 199.2200 202.9100
 203.7200

PROPERTY TABLE C MAT= 13 NUM. POINTS= 5
 SLOC= 1 868.0000 903.0000 946.0000 976.0000
 998.0000

 ** End of Material Property List **

Define new material 15 for low thermal loading
outer barrier of 70/30 Copper Nickel (C71500)
Density: DENS (kg/m³)
Emissivity : EMIS
Conductivity: KXX (W/m/K)
Specific Heat: C (J/kg/K)

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 1 ***

SLOC= 1 .000000E+00
Density (lb/in³ converted to kg/m³)

PROPERTY TABLE DENS MAT= 15 NUM. POINTS= 1

SLOC= 1 8940.640
Emissivity

PROPERTY TABLE EMIS MAT= 15 NUM. POINTS= 1

SLOC= 1 .4000000
Specific Heat (Btu/lb/F converted to J/kg/K)

PROPERTY TABLE C MAT= 15 NUM. POINTS= 1

SLOC= 1 376.7898
Conductivity (Btu/hr/ft/F converted to W/m/K)

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 2 ***

SLOC= 1 20.00000 100.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 4 ***

SLOC= 3 200.0000 300.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***

SLOC= 5 400.0000 500.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 8 ***

SLOC= 7 600.0000 700.0000

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 2

SLOC= 1 29.42190 29.24883

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 4

SLOC= 3 34.09479 38.59461

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 6

SLOC= 5 43.09443 48.11346

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 8

SLOC= 7 53.13249 58.15152

Read in single drum heat loads
Calculate the volumetric heat generation
(Assembly time is in years, FUEL is in seconds)

/INPUT FILE= pusgls2.dat LINE= 0

** History of DHLW GLASS POUR CANISTER Heat Generation Rates **
** Output Calculated by T. L. Lotz 5/09/95 for ORNL Report Data **

** Executable File Name: MATHCAD.EXE **
** Output File Name: pusgls2.dat **
** Execution Date: 05/08/95 **
** Start Age (years): 0.0 **
** Decay Period (years): 10000 **
** Enrichment (kg Pu): N.A. **
** Burnup (MWd/MTM): N.A. **
** Assembly Type: SR Pour Canisters **
** Pu Fract. (kg Pu/KG HM):N.A. **

```

**
** ASSY(#,1) is the Pour Calinster heat in Watts.
** ASSY(#,0) is the time post emplacement in years.
*****

```

PARAMETER ASSY(1,1) =	852.9300 852.3600	852.7900 852.2100	852.6400	852.5000
PARAMETER ASSY(7,1) =	852.0700 851.5000	851.9300 850.7800	851.7800	851.6400
PARAMETER ASSY(13,1) =	850.0700 847.2200	849.3500 846.5100	848.6400	847.9300
PARAMETER ASSY(19,1) =	845.8000 842.9700	845.0900 842.2600	844.3800	843.6800
PARAMETER ASSY(25,1) =	841.5600 838.7500	840.8600 831.7800	840.1500	839.4500
PARAMETER ASSY(31,1) =	824.8900 798.1100	818.0800 791.6000	811.3500	804.6900
PARAMETER ASSY(37,1) =	785.1700 760.1700	778.8100 754.0900	772.5300	766.3100
PARAMETER ASSY(43,1) =	748.0900 724.7400	742.1500 670.8400	736.2800	730.4800
PARAMETER ASSY(49,1) =	622.7500 476.7700	579.8300 449.4800	541.5200	507.3200
PARAMETER ASSY(55,1) =	425.0900 350.7500	403.2900 336.7800	383.7900	366.3600
PARAMETER ASSY(61,1) =	324.2700 285.8900	313.0600 238.3900	303.0000	293.9900
PARAMETER ASSY(67,1) =	220.4900 202.1200	212.4400 199.9200	207.8700	204.6700
PARAMETER ASSY(73,1) =	197.9700 191.6300	196.1900 190.3000	194.5600	193.0400
PARAMETER ASSY(79,1) =	189.0500 184.6900	187.8700 176.7700	186.7600	185.7000
PARAMETER ASSY(85,1) =	171.2200 156.3700	166.8400 153.2600	163.0600	159.6100
PARAMETER ASSY(91,1) =	150.2700 139.1700	147.3800 136.5900	144.5600	141.8300
PARAMETER ASSY(97,1) =	134.0700 124.6400	131.6200	129.2300	126.9100
PARAMETER ASSY(1,0) =	.1000000E-05 .4000000E-01	.1000000E-01 .5000000E-01	.2000000E-01	.3000000E-01
PARAMETER ASSY(7,0) =	.6000000E-01 .1000000	.7000000E-01 .1500000	.8000000E-01	.9000000E-01
PARAMETER ASSY(13,0) =	.2000000 .4000000	.2500000 .4500000	.3000000	.3500000
PARAMETER ASSY(19,0) =	.5000000 .7000000	.5500000 .7500000	.6000000	.6500000
PARAMETER ASSY(25,0) =	.8000000 1.000000	.8500000 1.500000	.9000000	.9500000

PARAMETER ASSY(31,0) =	2.000000 4.000000	2.500000 4.500000	3.000000	3.500000
PARAMETER ASSY(37,0) =	5.000000 7.000000	5.500000 7.500000	6.000000	6.500000
PARAMETER ASSY(43,0) =	8.000000 10.00000	8.500000 15.00000	9.000000	9.500000
PARAMETER ASSY(49,0) =	20.00000 40.00000	25.00000 45.00000	30.00000	35.00000
PARAMETER ASSY(55,0) =	50.00000 70.00000	55.00000 75.00000	60.00000	65.00000
PARAMETER ASSY(61,0) =	80.00000 100.0000	85.00000 150.0000	90.00000	95.00000
PARAMETER ASSY(67,0) =	200.0000 400.0000	250.0000 450.0000	300.0000	350.0000
PARAMETER ASSY(73,0) =	500.0000 700.0000	550.0000 750.0000	600.0000	650.0000
PARAMETER ASSY(79,0) =	800.0000 1000.000	850.0000 1500.000	900.0000	950.0000
PARAMETER ASSY(85,0) =	2000.000 4000.000	2500.000 4500.000	3000.000	3500.000
PARAMETER ASSY(91,0) =	5000.000 7000.000	5500.000 7500.000	6000.000	6500.000
PARAMETER ASSY(97,0) =	8000.000 10000.00	8500.000	9000.000	9500.000

PARAMETER ASSY(0,1) = 1.000000

FACTOR ON VECTOR OPERATION RESULT= .31558E+08
 FACTOR ON FIRST VECTOR PARAMETER = 1.0000
 FACTOR ON SECOND VECTOR PARAMETER= 1.0000
 FACTOR ON THIRD VECTOR PARAMETER = 1.0000

MATRIX COPY RESULT MATRIX= FUEL(1,0)
 INPUT MATRIX= ASSY(1,0)
 INPUT MATRIX SIZE= 101 ROWS BY 2 COLUMNS
 RESULT MATRIX SIZE= 101 ROWS BY 2 COLUMNS

FACTOR ON VECTOR OPERATION RESULT= 1.6939
 FACTOR ON FIRST VECTOR PARAMETER = 1.0000
 FACTOR ON SECOND VECTOR PARAMETER= 1.0000
 FACTOR ON THIRD VECTOR PARAMETER = 1.0000

VECTOR PARAMETER OPERATION *VFUN
 FUEL(1) = COPY ASSY(1)
 SCALE FACTORS RESULT= 1.6939 INPUT= 1.0000
 VECTOR LENGTH= 101

PARAMETER FUEL(0,1) = 1.000000

Define LOCAL Coordinate system for canister orientation
 if use CSYS,0, the P. Cans are 2x2,
 if use CSYS,15, the P. Cans are 1x2x1

LOCAL,15,0,0,0,0,0,0,45.0,0,0,0,0,

Construct geometry for a single SRP Pour Canister
 (K's 1 - 10)

(L's 1 - 16)
(A's 1 - 8)

KEYPOINT	1	X,Y,Z=	.000000E+00	.000000E+00	.000000E+00	IN CSYS= 0
KEYPOINT	2	X,Y,Z=	.324951	.324951	.000000E+00	IN CSYS= 0
KEYPOINT	3	X,Y,Z=	.116142	.116142	.000000E+00	IN CSYS= 0
KEYPOINT	4	X,Y,Z=	.116142	.533759	.000000E+00	IN CSYS= 0
KEYPOINT	5	X,Y,Z=	.533759	.533759	.000000E+00	IN CSYS= 0
KEYPOINT	6	X,Y,Z=	.533759	.116142	.000000E+00	IN CSYS= 0
KEYPOINT	7	X,Y,Z=	.109424	.109424	.000000E+00	IN CSYS= 0
KEYPOINT	8	X,Y,Z=	.109424	.540477	.000000E+00	IN CSYS= 0
KEYPOINT	9	X,Y,Z=	.540477	.540477	.000000E+00	IN CSYS= 0
KEYPOINT	10	X,Y,Z=	.540477	.109424	.000000E+00	IN CSYS= 0

LINE CONNECTS KEYPOINTS 3 2
 LINE NO.= 1 KP1= 3 TAN1= -.7071 -.7071 .0000
 KP2= 2 TAN2= .7071 .7071 .0000

LINE CONNECTS KEYPOINTS 2 6
 LINE NO.= 2 KP1= 2 TAN1= -.7071 .7071 .0000
 KP2= 6 TAN2= .7071 -.7071 .0000

LINE CONNECTS KEYPOINTS 4 2
 LINE NO.= 3 KP1= 4 TAN1= -.7071 .7071 .0000
 KP2= 2 TAN2= .7071 -.7071 .0000

LINE CONNECTS KEYPOINTS 2 5
 LINE NO.= 4 KP1= 2 TAN1= -.7071 -.7071 .0000
 KP2= 5 TAN2= .7071 .7071 .0000

ARC BETWEEN KEYPOINTS 6 AND 5 ORIENTATION KEYPOINT= 2
 RADIUS= .29530
 LINE NO.= 5 KP1= 6 TAN1= -.7071 -.7071 .0000
 KP2= 5 TAN2= -.7071 .7071 .0000

ARC BETWEEN KEYPOINTS 5 AND 4 ORIENTATION KEYPOINT= 2
 RADIUS= .29530
 LINE NO.= 6 KP1= 5 TAN1= .7071 -.7071 .0000
 KP2= 4 TAN2= -.7071 -.7071 .0000

ARC BETWEEN KEYPOINTS 4 AND 3 ORIENTATION KEYPOINT= 2
 RADIUS= .29530
 LINE NO.= 7 KP1= 4 TAN1= .7071 .7071 .0000
 KP2= 3 TAN2= .7071 -.7071 .0000

ARC BETWEEN KEYPOINTS 3 AND 6 ORIENTATION KEYPOINT= 2
 RADIUS= .29530
 LINE NO.= 8 KP1= 3 TAN1= -.7071 .7071 .0000
 KP2= 6 TAN2= .7071 .7071 .0000

LINE CONNECTS KEYPOINTS 7 3
 LINE NO.= 9 KP1= 7 TAN1= -.7071 -.7071 .0000
 KP2= 3 TAN2= .7071 .7071 .0000

LINE CONNECTS KEYPOINTS 10 6
 LINE NO.= 10 KP1= 10 TAN1= .7071 -.7071 .0000
 KP2= 6 TAN2= -.7071 .7071 .0000

LINE CONNECTS KEYPOINTS 9 5
 LINE NO.= 11 KP1= 9 TAN1= .7071 .7071 .0000
 KP2= 5 TAN2= -.7071 -.7071 .0000

LINE CONNECTS KEYPOINTS 8 4
 LINE NO.= 12 KP1= 8 TAN1= -.7071 .7071 .0000
 KP2= 4 TAN2= .7071 -.7071 .0000

ARC BETWEEN KEYPOINTS 7 AND 8 ORIENTATION KEYPOINT= 2
 RADIUS= .30480
 LINE NO.= 13 KP1= 7 TAN1= .7071 -.7071 .0000
 KP2= 8 TAN2= .7071 .7071 .0000

ARC BETWEEN KEYPOINTS 8 AND 9 ORIENTATION KEYPOINT= 2
 RADIUS= .30480
 LINE NO.= 14 KP1= 8 TAN1= -.7071 -.7071 .0000
 KP2= 9 TAN2= .7071 -.7071 .0000

ARC BETWEEN KEYPOINTS 9 AND 10 ORIENTATION KEYPOINT= 2
 RADIUS= .30480
 LINE NO.= 15 KP1= 9 TAN1= -.7071 .7071 .0000
 KP2= 10 TAN2= -.7071 -.7071 .0000

ARC BETWEEN KEYPOINTS 10 AND 7 ORIENTATION KEYPOINT= 2
 RADIUS= .30480
 LINE NO.= 16 KP1= 10 TAN1= .7071 .7071 .0000
 KP2= 7 TAN2= -.7071 .7071 .0000

DEFINE AREA BY LIST OF LINES
 LINE LIST = 2 4 5
 (TRAVERSED IN SAME DIRECTION AS LINE 2)
 AREA NUMBER = 1

DEFINE AREA BY LIST OF LINES
 LINE LIST = 1 2 8
 (TRAVERSED IN SAME DIRECTION AS LINE 1)
 AREA NUMBER = 2

DEFINE AREA BY LIST OF LINES
 LINE LIST = 1 3 7
 (TRAVERSED IN SAME DIRECTION AS LINE 1)
 AREA NUMBER = 3

DEFINE AREA BY LIST OF LINES
 LINE LIST = 3 4 6
 (TRAVERSED IN SAME DIRECTION AS LINE 3)
 AREA NUMBER = 4

DEFINE AREA BY LIST OF LINES
 LINE LIST = 5 10 15 11
 (TRAVERSED IN SAME DIRECTION AS LINE 5)
 AREA NUMBER = 5

DEFINE AREA BY LIST OF LINES
 LINE LIST = 8 9 16 10
 (TRAVERSED IN SAME DIRECTION AS LINE 8)
 AREA NUMBER = 6

DEFINE AREA BY LIST OF LINES
 LINE LIST = 7 12 13 9
 (TRAVERSED IN SAME DIRECTION AS LINE 7)
 AREA NUMBER = 7

DEFINE AREA BY LIST OF LINES
 LINE LIST = 6 11 14 12
 (TRAVERSED IN SAME DIRECTION AS LINE 6)

AREA NUMBER = 8

Interior and WP, Next

(K's 11 - 19)

(L's 17 - 34)

(A's 9 - 16)

KEYPOINT	11	X,Y,Z=	.784500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	12	X,Y,Z=	.554725	.554725	.000000E+00	IN CSYS=	0
KEYPOINT	13	X,Y,Z=	.000000E+00	.784500	.000000E+00	IN CSYS=	0
KEYPOINT	14	X,Y,Z=	.804500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	15	X,Y,Z=	.568867	.568867	.000000E+00	IN CSYS=	0
KEYPOINT	16	X,Y,Z=	.000000E+00	.804500	.000000E+00	IN CSYS=	0
KEYPOINT	17	X,Y,Z=	.854500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	18	X,Y,Z=	.604223	.604223	.000000E+00	IN CSYS=	0
KEYPOINT	19	X,Y,Z=	.000000E+00	.854500	.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS	1	7			
LINE NO.= 17	KP1=	1	TAN1=	-.7071	-.7071
	KP2=	7	TAN2=	.7071	.7071
				.0000	.0000

LINE CONNECTS KEYPOINTS	10	11			
LINE NO.= 18	KP1=	10	TAN1=	-.9125	-.4092
	KP2=	11	TAN2=	.9125	-.4092
				.0000	.0000

LINE CONNECTS KEYPOINTS	9	12			
LINE NO.= 19	KP1=	9	TAN1=	-.7071	-.7071
	KP2=	12	TAN2=	.7071	.7071
				.0000	.0000

LINE CONNECTS KEYPOINTS	8	13			
LINE NO.= 20	KP1=	8	TAN1=	.4092	-.9125
	KP2=	13	TAN2=	-.4092	.9125
				.0000	.0000

LINE CONNECTS KEYPOINTS	1	13			
LINE NO.= 21	KP1=	1	TAN1=	.0000	-1.0000
	KP2=	13	TAN2=	.0000	1.0000
				.0000	.0000

LINE CONNECTS KEYPOINTS	1	11			
LINE NO.= 22	KP1=	1	TAN1=	-1.0000	.0000
	KP2=	11	TAN2=	1.0000	.0000
				.0000	.0000

ARC BETWEEN KEYPOINTS	11 AND	12	ORIENTATION KEYPOINT=	1
RADIUS=	.78450			
LINE NO.= 23	KP1=	11	TAN1=	.0000
	KP2=	12	TAN2=	-1.0000
				.0000

ARC BETWEEN KEYPOINTS	12 AND	13	ORIENTATION KEYPOINT=	1
RADIUS=	.78450			
LINE NO.= 24	KP1=	12	TAN1=	.7071
	KP2=	13	TAN2=	-1.0000
				.0000

LINE CONNECTS KEYPOINTS	11	14			
LINE NO.= 25	KP1=	11	TAN1=	-1.0000	.0000
	KP2=	14	TAN2=	1.0000	.0000
				.0000	.0000

LINE CONNECTS KEYPOINTS	12	15			
LINE NO.= 26	KP1=	12	TAN1=	-.7071	-.7071
	KP2=	15	TAN2=	.7071	.7071
				.0000	.0000

LINE CONNECTS KEYPOINTS	16	13			

LINE NO.= 27 KP1= 16 TAN1= .0000 1.0000 .0000
 KP2= 13 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 14 AND 15 ORIENTATION KEYPOINT= 1
 RADIUS= .80450

LINE NO.= 28 KP1= 14 TAN1= .0000 -1.0000 .0000
 KP2= 15 TAN2= -.7071 .7071 .0000

ARC BETWEEN KEYPOINTS 15 AND 16 ORIENTATION KEYPOINT= 1
 RADIUS= .80450

LINE NO.= 29 KP1= 15 TAN1= .7071 -.7071 .0000
 KP2= 16 TAN2= -1.0000 .0000 .0000

LINE CONNECTS KEYPOINTS 14 17

LINE NO.= 30 KP1= 14 TAN1= -1.0000 .0000 .0000
 KP2= 17 TAN2= 1.0000 .0000 .0000

LINE CONNECTS KEYPOINTS 15 18

LINE NO.= 31 KP1= 15 TAN1= -.7071 -.7071 .0000
 KP2= 18 TAN2= .7071 .7071 .0000

LINE CONNECTS KEYPOINTS 19 16

LINE NO.= 32 KP1= 19 TAN1= .0000 1.0000 .0000
 KP2= 16 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 18 AND 17 ORIENTATION KEYPOINT= 1
 RADIUS= .85450

LINE NO.= 33 KP1= 18 TAN1= -.7071 .7071 .0000
 KP2= 17 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 19 AND 18 ORIENTATION KEYPOINT= 1
 RADIUS= .85450

LINE NO.= 34 KP1= 19 TAN1= -1.0000 .0000 .0000
 KP2= 18 TAN2= .7071 -.7071 .0000

DEFINE AREA BY LIST OF LINES

LINE LIST = 22 18 16 17
 (TRAVERSED IN SAME DIRECTION AS LINE 22)

AREA NUMBER = 9

DEFINE AREA BY LIST OF LINES

LINE LIST = 23 19 15 18
 (TRAVERSED IN SAME DIRECTION AS LINE 23)

AREA NUMBER = 10

DEFINE AREA BY LIST OF LINES

LINE LIST = 24 20 14 19
 (TRAVERSED IN SAME DIRECTION AS LINE 24)

AREA NUMBER = 11

DEFINE AREA BY LIST OF LINES

LINE LIST = 21 17 13 20
 (TRAVERSED IN SAME DIRECTION AS LINE 21)

AREA NUMBER = 12

DEFINE AREA BY LIST OF LINES

LINE LIST = 23 25 28 26
 (TRAVERSED IN SAME DIRECTION AS LINE 23)

AREA NUMBER = 13

DEFINE AREA BY LIST OF LINES

LINE LIST = 24 26 29 27
 (TRAVERSED IN SAME DIRECTION AS LINE 24)

```
AREA NUMBER = 14

DEFINE AREA BY LIST OF LINES
LINE LIST = 28 30 33 31
(TRAVERSED IN SAME DIRECTION AS LINE 28)

AREA NUMBER = 15

DEFINE AREA BY LIST OF LINES
LINE LIST = 29 31 34 32
(TRAVERSED IN SAME DIRECTION AS LINE 29)

AREA NUMBER = 16
*****
Set element shapes and sizes

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

DEFAULT ELEMENT DIVISIONS PER LINE = 1

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 4 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 5 TO 8 STEP 1

8 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 13 TO 16 STEP 1

12 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 21 TO 24 STEP 1

16 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 28 TO 29 STEP 1

18 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 33 TO 34 STEP 1

20 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 9 TO 12 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 17 TO 20 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 25 TO 27 STEP 1
```

7 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 30 TO 32 STEP 1

10 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 34 STEP 1

34 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

Mesh areas
glass, stainless pour canister, He, IB, OB,

MATERIAL NUMBER SET TO 5

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 1 TO 4 IN STEPS OF 1

NUMBER OF AREAS MESHED = 4
MAXIMUM NODE NUMBER = 57
MAXIMUM ELEMENT NUMBER = 48

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 5 TO 8 IN STEPS OF 1

NUMBER OF AREAS MESHED = 4
MAXIMUM NODE NUMBER = 73
MAXIMUM ELEMENT NUMBER = 64

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 9 TO 12 IN STEPS OF 1

*** WARNING *** CP= 2.970 TIME= 10:45:00
Area 9 has a corner angle of 24 degrees. This is not recommended for
quadrilateral elements.

*** WARNING *** CP= 2.990 TIME= 10:45:00
Meshing of area 9 produced 5 poorly shaped elements.

*** NOTE *** CP= 2.990 TIME= 10:45:00
Worst shape angle is 18 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
67 68 70 71 72

*** WARNING *** CP= 3.050 TIME= 10:45:00
Area 12 has a corner angle of 24 degrees. This is not recommended for
quadrilateral elements.

*** WARNING *** CP= 3.070 TIME= 10:45:00
Meshing of area 12 produced 5 poorly shaped elements.

*** NOTE ***

CP= 3.070 TIME= 10:45:00

Worst shape angle is 18 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***

92 93 94 95 96

NUMBER OF AREAS MESHED = 4
 MAXIMUM NODE NUMBER = 105
 MAXIMUM ELEMENT NUMBER = 96

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 13 TO 14 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 123
 MAXIMUM ELEMENT NUMBER = 112

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 15 TO 16 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 141
 MAXIMUM ELEMENT NUMBER = 128

Set up paths to extrude 3-D volumes from 2-D surfaces

(K's 20 - 31)

(L's 35 - 46)

Bottom direction first

KEYPOINT	20	X,Y,Z=	.000000E+00	.000000E+00	-1.49500	IN CSYS= 0
KEYPOINT	21	X,Y,Z=	.000000E+00	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	22	X,Y,Z=	.000000E+00	.000000E+00	-1.53500	IN CSYS= 0
KEYPOINT	23	X,Y,Z=	.000000E+00	.000000E+00	-1.56000	IN CSYS= 0
KEYPOINT	24	X,Y,Z=	.000000E+00	.000000E+00	-1.61500	IN CSYS= 0

LINE CONNECTS KEYPOINTS 1 20
 LINE NO.= 35 KP1= 1 TAN1=.0000 .0000 1.0000
 KP2= 20 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 20 21
 LINE NO.= 36 KP1= 20 TAN1=.0000 .0000 1.0000
 KP2= 21 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 21 22
 LINE NO.= 37 KP1= 21 TAN1=.0000 .0000 1.0000
 KP2= 22 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 22 23
 LINE NO.= 38 KP1= 22 TAN1=.0000 .0000 1.0000
 KP2= 23 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 23 24
 LINE NO.= 39 KP1= 23 TAN1=.0000 .0000 1.0000
 KP2= 24 TAN2=.0000 .0000 -1.0000

Top direction Next

KEYPOINT	25	X,Y,Z=	.000000E+00	.000000E+00	.659900	IN CSYS= 0

KEYPOINT 26 X,Y,Z= .000000E+00 .000000E+00 1.21460 IN CSYS= 0
 KEYPOINT 27 X,Y,Z= .000000E+00 .000000E+00 1.23460 IN CSYS= 0
 KEYPOINT 28 X,Y,Z= .000000E+00 .000000E+00 1.50500 IN CSYS= 0
 KEYPOINT 29 X,Y,Z= .000000E+00 .000000E+00 1.53000 IN CSYS= 0
 KEYPOINT 30 X,Y,Z= .000000E+00 .000000E+00 1.56000 IN CSYS= 0
 KEYPOINT 31 X,Y,Z= .000000E+00 .000000E+00 1.61500 IN CSYS= 0

LINE CONNECTS KEYPOINTS 1 25
 LINE NO.= 40 KP1= 1 TAN1=.0000 .0000 -1.0000
 KP2= 25 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 25 26
 LINE NO.= 41 KP1= 25 TAN1=.0000 .0000 -1.0000
 KP2= 26 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 26 27
 LINE NO.= 42 KP1= 26 TAN1=.0000 .0000 -1.0000
 KP2= 27 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 27 28
 LINE NO.= 43 KP1= 27 TAN1=.0000 .0000 -1.0000
 KP2= 28 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 28 29
 LINE NO.= 44 KP1= 28 TAN1=.0000 .0000 -1.0000
 KP2= 29 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 29 30
 LINE NO.= 45 KP1= 29 TAN1=.0000 .0000 -1.0000
 KP2= 30 TAN2=.0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 30 31
 LINE NO.= 46 KP1= 30 TAN1=.0000 .0000 -1.0000
 KP2= 31 TAN2=.0000 .0000 1.0000

Set number of element divisions for extrusion into 3-D

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
 PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.
 GLASS

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 35 TO 35 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
 TO NDIV = 3, SPACING RATIO = 1.000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 40 TO 40 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 41 TO 41 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 36 TO 36 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 42 TO 42 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 1, SPACING RATIO = 1.000
Interior WP He Space

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 37 TO 37 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 43 TO 43 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 3, SPACING RATIO = 1.000
Inner Barrier Lids

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 38 TO 38 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 44 TO 44 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 2, SPACING RATIO = 1.000
Outer/Inner Barrier Gap (HE)

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 45 TO 45 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 39 TO 39 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 46 TO 46 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 46 STEP 1

46 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

Reset coordinates if CSYS,15, option was used

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

Set up drift wall radiation matrix

(K's 32 - 34)

1) Define K's for extrude (will not use)

KEYPOINT 32 X,Y,Z= .000000E+00 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 33 X,Y,Z= .000000E+00 .183300 8.08250 IN CSYS= 0

KEYPOINT 34 X,Y,Z= .000000E+00 .183300 -8.08250 IN CSYS= 0

Define extrude lines (will not use)

(L's 47,48)

LINE CONNECTS KEYPOINTS 32 33

LINE NO.= 47 KP1= 32 TAN1= .0000 .0000 -1.0000

KP2= 33 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 32 34

LINE NO.= 48 KP1= 32 TAN1= .0000 .0000 1.0000

KP2= 34 TAN2= .0000 .0000 -1.0000

Extrude drift 8 elements with smallest
elements at WP mid-length (will not use)

SET DIVISIONS ON LINE 47 (IF SELECTED AND UNMESHED)

TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 48 (IF SELECTED AND UNMESHED)

TO NDIV = 8, SPACING RATIO = 8.400

2) Define K's and lines for lines of drift wall

(K's 35 - 39)

(L's 49 - 53)

Center Point

KEYPOINT 35 X,Y,Z= 1.73494 -1.61670 .000000E+00 IN CSYS= 0

KEYPOINT 36 X,Y,Z= 2.50000 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 37 X,Y,Z= .000000E+00 2.68330 .000000E+00 IN CSYS= 0

KEYPOINT 38 X,Y,Z= -2.50000 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 39 X,Y,Z= -1.73494 -1.61670 .000000E+00 IN CSYS= 0

ARC BETWEEN KEYPOINTS 35 AND 36 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 49 KP1= 35 TAN1= -.7200 -.6940 .0000

KP2= 36 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 36 AND 37 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 50 KP1= 36 TAN1= .0000 -1.0000 .0000

KP2= 37 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 37 AND 38 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 51 KP1= 37 TAN1= 1.0000 .0000 .0000

KP2= 38 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 38 AND 39 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000


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LINE NO.= 52 KP1= 38 TAN1= .0000 1.0000 .0000
              KP2= 39 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 39 35
LINE NO.= 53 KP1= 39 TAN1= -1.0000 .0000 .0000
              KP2= 35 TAN2= 1.0000 .0000 .0000
              Set element spacing for meshing

SET DIVISIONS ON LINE 49 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 50 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 51 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 52 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 53 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000
  Back Point
  (K's 40 - 44)
  (L's 54 - 58)

KEYPOINT 40 X,Y,Z= 1.73494 -1.61670 -8.08250 IN CSYS= 0
KEYPOINT 41 X,Y,Z= 2.50000 .183300 -8.08250 IN CSYS= 0
KEYPOINT 42 X,Y,Z= .000000E+00 2.68330 -8.08250 IN CSYS= 0
KEYPOINT 43 X,Y,Z= -2.50000 .183300 -8.08250 IN CSYS= 0
KEYPOINT 44 X,Y,Z= -1.73494 -1.61670 -8.08250 IN CSYS= 0

ARC BETWEEN KEYPOINTS 40 AND 41 ORIENTATION KEYPOINT= 34
RADIUS= 2.5000
LINE NO.= 54 KP1= 40 TAN1= -.7200 -.6940 .0000
              KP2= 41 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 41 AND 42 ORIENTATION KEYPOINT= 34
RADIUS= 2.5000
LINE NO.= 55 KP1= 41 TAN1= .0000 -1.0000 .0000
              KP2= 42 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 42 AND 43 ORIENTATION KEYPOINT= 34
RADIUS= 2.5000
LINE NO.= 56 KP1= 42 TAN1= 1.0000 .0000 .0000
              KP2= 43 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 43 AND 44 ORIENTATION KEYPOINT= 34
RADIUS= 2.5000
LINE NO.= 57 KP1= 43 TAN1= .0000 1.0000 .0000
              KP2= 44 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 44 40
LINE NO.= 58 KP1= 44 TAN1= -1.0000 .0000 .0000
              KP2= 40 TAN2= 1.0000 .0000 .0000
              Set element spacing for meshing

SET DIVISIONS ON LINE 54 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 55 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 56 (IF SELECTED AND UNMESHED)
  TO NDIV = 4, SPACING RATIO = 1.000

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SET DIVISIONS ON LINE 57 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 58 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000
Front Point

(K's 45 - 49)
(L's 59 - 63)

KEYPOINT	45	X,Y,Z=	1.73494	-1.61670	8.08250	IN CSYS=	0
KEYPOINT	46	X,Y,Z=	2.50000	.183300	8.08250	IN CSYS=	0
KEYPOINT	47	X,Y,Z=	.000000E+00	2.68330	8.08250	IN CSYS=	0
KEYPOINT	48	X,Y,Z=	-2.50000	.183300	8.08250	IN CSYS=	0
KEYPOINT	49	X,Y,Z=	-1.73494	-1.61670	8.08250	IN CSYS=	0

ARC BETWEEN KEYPOINTS 45 AND 46 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 59 KP1= 45 TAN1= -.7200 -.6940 .0000
KP2= 46 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 46 AND 47 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 60 KP1= 46 TAN1= .0000 -1.0000 .0000
KP2= 47 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 47 AND 48 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 61 KP1= 47 TAN1= 1.0000 .0000 .0000
KP2= 48 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 48 AND 49 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 62 KP1= 48 TAN1= .0000 1.0000 .0000
KP2= 49 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 49 45
LINE NO.= 63 KP1= 49 TAN1= -1.0000 .0000 .0000
KP2= 45 TAN2= 1.0000 .0000 .0000
Set element spacing for meshing

SET DIVISIONS ON LINE 59 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 60 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 61 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 62 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 63 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000
3) Create connecting lines for wall; make areas
(L's 64 - 68)

LINE CONNECTS KEYPOINTS 35 40
LINE NO.= 64 KP1= 35 TAN1= .0000 .0000 1.0000
KP2= 40 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 36 41
LINE NO.= 65 KP1= 36 TAN1= .0000 .0000 1.0000
KP2= 41 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 37 42

LINE NO.= 66 KP1= 37 TAN1=.0000 .0000 1.0000
 KP2= 42 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 38 43
 LINE NO.= 67 KP1= 38 TAN1=.0000 .0000 1.0000
 KP2= 43 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 39 44
 LINE NO.= 68 KP1= 39 TAN1=.0000 .0000 1.0000
 KP2= 44 TAN2=.0000 .0000 -1.0000

SET DIVISIONS ON LINE 64 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 65 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 66 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 67 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 68 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400
 (L's 69 - 73)

LINE CONNECTS KEYPOINTS 45 35
 LINE NO.= 69 KP1= 45 TAN1=.0000 .0000 1.0000
 KP2= 35 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 46 36
 LINE NO.= 70 KP1= 46 TAN1=.0000 .0000 1.0000
 KP2= 36 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 47 37
 LINE NO.= 71 KP1= 47 TAN1=.0000 .0000 1.0000
 KP2= 37 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 48 38
 LINE NO.= 72 KP1= 48 TAN1=.0000 .0000 1.0000
 KP2= 38 TAN2=.0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 49 39
 LINE NO.= 73 KP1= 49 TAN1=.0000 .0000 1.0000
 KP2= 39 TAN2=.0000 .0000 -1.0000

SET DIVISIONS ON LINE 69 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 70 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 71 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 72 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 73 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

Define cylindrical coordinate system for rotations, etc.

COORDINATE SYSTEM 11 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .00000E+00 .00000E+00 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

(A's 17 - 26)

DEFINE AREA BY LIST OF LINES

LINE LIST = 49 65 54 64
(TRAVERSED IN SAME DIRECTION AS LINE 49)

*** WARNING *** CP= 3.610 TIME= 10:45:01

Lines 49, 65, 54, and 64 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 17

DEFINE AREA BY LIST OF LINES

LINE LIST = 50 66 55 65
(TRAVERSED IN SAME DIRECTION AS LINE 50)

*** WARNING *** CP= 3.660 TIME= 10:45:01

Lines 50, 66, 55, and 65 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 18

DEFINE AREA BY LIST OF LINES

LINE LIST = 51 67 56 66
(TRAVERSED IN SAME DIRECTION AS LINE 51)

*** WARNING *** CP= 3.700 TIME= 10:45:01

Lines 51, 67, 56, and 66 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 19

DEFINE AREA BY LIST OF LINES

LINE LIST = 52 68 57 67
(TRAVERSED IN SAME DIRECTION AS LINE 52)

*** WARNING *** CP= 3.730 TIME= 10:45:01

Lines 52, 68, 57, and 67 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 20

DEFINE AREA BY LIST OF LINES

LINE LIST = 59 70 49 69
(TRAVERSED IN SAME DIRECTION AS LINE 59)

*** WARNING *** CP= 3.770 TIME= 10:45:01

Lines 59, 70, 49, and 69 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 21

DEFINE AREA BY LIST OF LINES

LINE LIST = 60 71 50 70
(TRAVERSED IN SAME DIRECTION AS LINE 60)

*** WARNING *** CP= 3.810 TIME= 10:45:01

Lines 60, 71, 50, and 70 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 22

DEFINE AREA BY LIST OF LINES

LINE LIST = 61 72 51 71
(TRAVERSED IN SAME DIRECTION AS LINE 61)

*** WARNING *** CP= 3.850 TIME= 10:45:01

Lines 61, 72, 51, and 71 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 23

DEFINE AREA BY LIST OF LINES

LINE LIST = 62 73 52 72
(TRAVERSED IN SAME DIRECTION AS LINE 62)

*** WARNING *** CP= 3.890 TIME= 10:45:01

Lines 62, 73, 52, and 72 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 24

DEFINE AREA BY LIST OF LINES

LINE LIST = 53 64 58 68
(TRAVERSED IN SAME DIRECTION AS LINE 53)

AREA NUMBER = 25

DEFINE AREA BY LIST OF LINES

LINE LIST = 63 69 53 73
(TRAVERSED IN SAME DIRECTION AS LINE 63)

AREA NUMBER = 26

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)
4) Set material type and Mesh areas

MATERIAL NUMBER SET TO 6

ELEMENT TYPE SET TO 11

GENERATE NODES AND ELEMENTS
IN AREAS 17 TO 24 IN STEPS OF 1

NUMBER OF AREAS MESHED = 8
MAXIMUM NODE NUMBER = 430
MAXIMUM ELEMENT NUMBER = 384

MATERIAL NUMBER SET TO 4

ELEMENT TYPE SET TO 11

GENERATE NODES AND ELEMENTS
IN AREAS 25 TO 26 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
MAXIMUM NODE NUMBER = 481
MAXIMUM ELEMENT NUMBER = 448

5) Set 3-D radiation shell elements

ELEMENT TYPE SET TO 46

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 481 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 46 REAL= 1 MATERIAL= 4 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 26 STEP 1

26 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 73 STEP 1

73 LINES (OF 73 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=KP COMPONENT=
IN RANGE 1 TO 49 STEP 1

49 KEYPOINTS (OF 49 DEFINED) SELECTED BY KSEL COMMAND.

Construct geometry for WP TOP end
(K's 50 - 55)

KEYPOINT	50	X,Y,Z=	.784500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	51	X,Y,Z=	.000000E+00	.784500	1.23460	IN CSYS= 0
KEYPOINT	52	X,Y,Z=	.804500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	53	X,Y,Z=	.000000E+00	.804500	1.23460	IN CSYS= 0
KEYPOINT	54	X,Y,Z=	.854500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	55	X,Y,Z=	.000000E+00	.854500	1.23460	IN CSYS= 0

(L's 74 - 79)

LINE CONNECTS KEYPOINTS	27	50
LINE NO.= 74	KP1= 27	TAN1= -1.0000 .0000 .0000
	KP2= 50	TAN2= 1.0000 .0000 .0000
LINE CONNECTS KEYPOINTS	27	51
LINE NO.= 75	KP1= 27	TAN1= .0000 -1.0000 .0000
	KP2= 51	TAN2= .0000 1.0000 .0000
LINE CONNECTS KEYPOINTS	50	52
LINE NO.= 76	KP1= 50	TAN1= -1.0000 .0000 .0000
	KP2= 52	TAN2= 1.0000 .0000 .0000
LINE CONNECTS KEYPOINTS	51	53
LINE NO.= 77	KP1= 51	TAN1= .0000 -1.0000 .0000
	KP2= 53	TAN2= .0000 1.0000 .0000
LINE CONNECTS KEYPOINTS	52	54
LINE NO.= 78	KP1= 52	TAN1= -1.0000 .0000 .0000
	KP2= 54	TAN2= 1.0000 .0000 .0000
LINE CONNECTS KEYPOINTS	53	55
LINE NO.= 79	KP1= 53	TAN1= .0000 -1.0000 .0000
	KP2= 55	TAN2= .0000 1.0000 .0000

(L's 80 - 82)

ARC BETWEEN KEYPOINTS 50 AND 51 ORIENTATION KEYPOINT= 27
RADIUS= .78450

LINE NO.= 80 KP1= 50 TAN1=.0000 -1.0000 .0000
 KP2= 51 TAN2=-1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 52 AND 53 ORIENTATION KEYPOINT= 27
 RADIUS= .80450

LINE NO.= 81 KP1= 52 TAN1=.0000 -1.0000 .0000
 KP2= 53 TAN2=-1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 54 AND 55 ORIENTATION KEYPOINT= 27
 RADIUS= .85450

LINE NO.= 82 KP1= 54 TAN1=.0000 -1.0000 .0000
 KP2= 55 TAN2=-1.0000 .0000 .0000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 74 TO 75 STEP 1

2 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 80 TO 82 STEP 1

5 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
 TO NDIV = 8, SPACING RATIO = 1.000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 76 TO 79 STEP 1

4 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 1 TO 26 STEP 1

26 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 1 TO 82 STEP 1

82 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=KP COMPONENT=
 IN RANGE 1 TO 55 STEP 1

55 KEYPOINTS (OF 55 DEFINED) SELECTED BY KSEL COMMAND.
 (A's 27 - 29)

DEFINE AREA BY LIST OF LINES
 LINE LIST = 74 75 80
 (TRAVERSED IN SAME DIRECTION AS LINE 74)

AREA NUMBER = 27

DEFINE AREA BY LIST OF LINES
 LINE LIST = 80 76 81 77
 (TRAVERSED IN SAME DIRECTION AS LINE 80)

AREA NUMBER = 28

DEFINE AREA BY LIST OF LINES
 LINE LIST = 81 78 82 79
 (TRAVERSED IN SAME DIRECTION AS LINE 81)

AREA NUMBER = 29

 Construct geometry for WP Bottom end

(K's 56 - 61)

KEYPOINT	56	X,Y,Z=	.784500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	57	X,Y,Z=	.000000E+00	.784500	-1.51000	IN CSYS= 0
KEYPOINT	58	X,Y,Z=	.804500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	59	X,Y,Z=	.000000E+00	.804500	-1.51000	IN CSYS= 0
KEYPOINT	60	X,Y,Z=	.854500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	61	X,Y,Z=	.000000E+00	.854500	-1.51000	IN CSYS= 0

(L's 83 - 88)

LINE CONNECTS KEYPOINTS		21	56			
LINE NO.=	83	KP1=	21	TAN1=	-1.0000	.0000 .0000
		KP2=	56	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		21	57			
LINE NO.=	84	KP1=	21	TAN1=	.0000	-1.0000 .0000
		KP2=	57	TAN2=	.0000	1.0000 .0000
LINE CONNECTS KEYPOINTS		56	58			
LINE NO.=	85	KP1=	56	TAN1=	-1.0000	.0000 .0000
		KP2=	58	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		57	59			
LINE NO.=	86	KP1=	57	TAN1=	.0000	-1.0000 .0000
		KP2=	59	TAN2=	.0000	1.0000 .0000
LINE CONNECTS KEYPOINTS		58	60			
LINE NO.=	87	KP1=	58	TAN1=	-1.0000	.0000 .0000
		KP2=	60	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		59	61			
LINE NO.=	88	KP1=	59	TAN1=	.0000	-1.0000 .0000
		KP2=	61	TAN2=	.0000	1.0000 .0000

(L's 89 - 91)

ARC BETWEEN KEYPOINTS		56 AND	57	ORIENTATION KEYPOINT=	21
RADIUS=		.78450			
LINE NO.=	89	KP1=	56	TAN1=	.0000 -1.0000 .0000
		KP2=	57	TAN2=	-1.0000 .0000 .0000
ARC BETWEEN KEYPOINTS		58 AND	59	ORIENTATION KEYPOINT=	21
RADIUS=		.80450			
LINE NO.=	90	KP1=	58	TAN1=	.0000 -1.0000 .0000
		KP2=	59	TAN2=	-1.0000 .0000 .0000
ARC BETWEEN KEYPOINTS		60 AND	61	ORIENTATION KEYPOINT=	21
RADIUS=		.85450			
LINE NO.=	91	KP1=	60	TAN1=	.0000 -1.0000 .0000
		KP2=	61	TAN2=	-1.0000 .0000 .0000

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 83 TO 84 STEP 1

2 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 89 TO 91 STEP 1

5 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES


```

    TO NDIV = 8, SPACING RATIO = 1.000

SELECT      FOR ITEM=LINE COMPONENT=
IN RANGE    85 TO      88 STEP      1

    4 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT  FOR ITEM=AREA COMPONENT=
IN RANGE    1 TO      29 STEP      1

    29 AREAS (OF 29 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT  FOR ITEM=LINE COMPONENT=
IN RANGE    1 TO      91 STEP      1

    91 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT  FOR ITEM=KP  COMPONENT=
IN RANGE    1 TO      61 STEP      1

    61 KEYPOINTS (OF 61 DEFINED) SELECTED BY KSEL COMMAND.
    (A's 30 - 32 )

DEFINE AREA BY LIST OF LINES
    LINE LIST = 83 84 89
    (TRAVERSED IN SAME DIRECTION AS LINE 83)

    AREA NUMBER = 30

DEFINE AREA BY LIST OF LINES
    LINE LIST = 89 85 90 86
    (TRAVERSED IN SAME DIRECTION AS LINE 89)

    AREA NUMBER = 31

DEFINE AREA BY LIST OF LINES
    LINE LIST = 90 87 91 88
    (TRAVERSED IN SAME DIRECTION AS LINE 90)

    AREA NUMBER = 32
        Mesh areas
            Top and Bottom WP Ends

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
    PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
    IN AREAS 27 TO 32 IN STEPS OF 1

NUMBER OF AREAS MESHED = 6
MAXIMUM NODE NUMBER = 675
MAXIMUM ELEMENT NUMBER = 928
*****
    Extrude 2-D WP Interior into 3-D Space
    (V's 1 - 32)
        Bottom WP Area

DRAG AREAS
    1, 2, 3, 4,
    ALONG LINES
    35, 36,

DRAG AREAS

```

5, 6, 7, 8,
ALONG LINES
35, 36,

DRAG AREAS
9, 10, 11, 12,
ALONG LINES
35, 36,

DRAG AREAS
13, 14,
ALONG LINES
35, 36,

DRAG AREAS
15, 16,
ALONG LINES
35, 36,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT	20 USED FOR KEYPOINT(S)	88	
KEYPOINT	21 USED FOR KEYPOINT(S)	96	
KEYPOINT	56 USED FOR KEYPOINT(S)	97	110
KEYPOINT	57 USED FOR KEYPOINT(S)	102	114
KEYPOINT	58 USED FOR KEYPOINT(S)	113	122
KEYPOINT	59 USED FOR KEYPOINT(S)	115	126
KEYPOINT	60 USED FOR KEYPOINT(S)	125	
KEYPOINT	61 USED FOR KEYPOINT(S)	127	
KEYPOINT	63 USED FOR KEYPOINT(S)	72	
KEYPOINT	64 USED FOR KEYPOINT(S)	73	
KEYPOINT	65 USED FOR KEYPOINT(S)	76	
KEYPOINT	66 USED FOR KEYPOINT(S)	78	
KEYPOINT	68 USED FOR KEYPOINT(S)	80	
KEYPOINT	69 USED FOR KEYPOINT(S)	81	
KEYPOINT	70 USED FOR KEYPOINT(S)	84	
KEYPOINT	71 USED FOR KEYPOINT(S)	86	
KEYPOINT	74 USED FOR KEYPOINT(S)	93	
KEYPOINT	75 USED FOR KEYPOINT(S)	90	
KEYPOINT	77 USED FOR KEYPOINT(S)	91	
KEYPOINT	79 USED FOR KEYPOINT(S)	95	
KEYPOINT	82 USED FOR KEYPOINT(S)	101	
KEYPOINT	83 USED FOR KEYPOINT(S)	98	
KEYPOINT	85 USED FOR KEYPOINT(S)	99	
KEYPOINT	87 USED FOR KEYPOINT(S)	103	
KEYPOINT	89 USED FOR KEYPOINT(S)	104	
KEYPOINT	92 USED FOR KEYPOINT(S)	105	
KEYPOINT	94 USED FOR KEYPOINT(S)	108	
KEYPOINT	100 USED FOR KEYPOINT(S)	111	
KEYPOINT	106 USED FOR KEYPOINT(S)	117	
KEYPOINT	107 USED FOR KEYPOINT(S)	116	
KEYPOINT	109 USED FOR KEYPOINT(S)	120	
KEYPOINT	112 USED FOR KEYPOINT(S)	123	
LINE	35 USED FOR LINE(S)	159	
LINE	36 USED FOR LINE(S)	179	
LINE	83 USED FOR LINE(S)	178	

*** WARNING *** CP= 8.740 TIME= 10:45:06
Unmeshed line 178 is merged into meshed line 83.
LINE 84 USED FOR LINE(S) 196

*** WARNING *** CP= 8.740 TIME= 10:45:06
Unmeshed line 196 is merged into meshed line 84.
LINE 85 USED FOR LINE(S) 218

*** WARNING *** CP= 8.740 TIME= 10:45:06
Unmeshed line 218 is merged into meshed line 85.
LINE 86 USED FOR LINE(S) 221

*** WARNING *** CP= 8.740 TIME= 10:45:06
Unmeshed line 221 is merged into meshed line 86.

LINE 87 USED FOR LINE(S) 244

*** WARNING *** CP= 8.740 TIME= 10:45:06

Unmeshed line 244 is merged into meshed line 87.

LINE 88 USED FOR LINE(S) 247

*** WARNING *** CP= 8.740 TIME= 10:45:06

Unmeshed line 247 is merged into meshed line 88.

LINE 94 USED FOR LINE(S) 119

LINE 95 USED FOR LINE(S) 118

LINE 96 USED FOR LINE(S) 120

LINE 99 USED FOR LINE(S) 127

LINE 100 USED FOR LINE(S) 126

LINE 102 USED FOR LINE(S) 132

LINE 103 USED FOR LINE(S) 131

LINE 104 USED FOR LINE(S) 136

LINE 107 USED FOR LINE(S) 139

LINE 108 USED FOR LINE(S) 138

LINE 109 USED FOR LINE(S) 140

LINE 112 USED FOR LINE(S) 147

LINE 113 USED FOR LINE(S) 146

LINE 115 USED FOR LINE(S) 152

LINE 116 USED FOR LINE(S) 151

LINE 117 USED FOR LINE(S) 156

LINE 122 USED FOR LINE(S) 169

LINE 123 USED FOR LINE(S) 170

LINE 124 USED FOR LINE(S) 162

LINE 128 USED FOR LINE(S) 163

LINE 129 USED FOR LINE(S) 164

LINE 133 USED FOR LINE(S) 177

LINE 134 USED FOR LINE(S) 174

LINE 137 USED FOR LINE(S) 175

LINE 142 USED FOR LINE(S) 189

LINE 143 USED FOR LINE(S) 190

LINE 144 USED FOR LINE(S) 182

LINE 148 USED FOR LINE(S) 183

LINE 149 USED FOR LINE(S) 184

LINE 153 USED FOR LINE(S) 197

LINE 154 USED FOR LINE(S) 194

LINE 157 USED FOR LINE(S) 195

LINE 160 USED FOR LINE(S) 199

LINE 166 USED FOR LINE(S) 198

LINE 167 USED FOR LINE(S) 200

LINE 171 USED FOR LINE(S) 206

LINE 172 USED FOR LINE(S) 207

LINE 180 USED FOR LINE(S) 212

LINE 186 USED FOR LINE(S) 211

LINE 187 USED FOR LINE(S) 213

LINE 191 USED FOR LINE(S) 219

LINE 192 USED FOR LINE(S) 220

LINE 202 USED FOR LINE(S) 226

LINE 203 USED FOR LINE(S) 224

LINE 204 USED FOR LINE(S) 225

LINE 209 USED FOR LINE(S) 233

LINE 210 USED FOR LINE(S) 232

LINE 215 USED FOR LINE(S) 239

LINE 216 USED FOR LINE(S) 237

LINE 217 USED FOR LINE(S) 238

LINE 222 USED FOR LINE(S) 246

LINE 223 USED FOR LINE(S) 245

AREA 34 USED FOR AREA(S) 57

AREA 38 USED FOR AREA(S) 62

AREA 41 USED FOR AREA(S) 66

AREA 43 USED FOR AREA(S) 70

AREA 46 USED FOR AREA(S) 73

AREA 50 USED FOR AREA(S) 78

AREA 53 USED FOR AREA(S) 82

AREA 55 USED FOR AREA(S) 86

AREA 59 USED FOR AREA(S) 96

AREA 63 USED FOR AREA(S) 91

AREA	67	USED FOR AREA(S)	103
AREA	71	USED FOR AREA(S)	100
AREA	75	USED FOR AREA(S)	112
AREA	79	USED FOR AREA(S)	107
AREA	83	USED FOR AREA(S)	119
AREA	87	USED FOR AREA(S)	116
AREA	94	USED FOR AREA(S)	121
AREA	98	USED FOR AREA(S)	126
AREA	110	USED FOR AREA(S)	130
AREA	114	USED FOR AREA(S)	135
AREA	123	USED FOR AREA(S)	139
AREA	128	USED FOR AREA(S)	144
AREA	132	USED FOR AREA(S)	148
AREA	137	USED FOR AREA(S)	153

(V's 33 - 80)

Top WP Area

DRAG AREAS
 1, 2, 3, 4,
 ALONG LINES
 40, 41, 42,

DRAG AREAS
 5, 6, 7, 8,
 ALONG LINES
 40, 41, 42,

DRAG AREAS
 9, 10, 11, 12,
 ALONG LINES
 40, 41, 42,

DRAG AREAS
 13, 14,
 ALONG LINES
 40, 41, 42,

DRAG AREAS
 15, 16,
 ALONG LINES
 40, 41, 42,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT	25	USED FOR KEYPOINT(S)	131	
KEYPOINT	26	USED FOR KEYPOINT(S)	139	
KEYPOINT	27	USED FOR KEYPOINT(S)	147	
KEYPOINT	50	USED FOR KEYPOINT(S)	148	167
KEYPOINT	51	USED FOR KEYPOINT(S)	153	171
KEYPOINT	52	USED FOR KEYPOINT(S)	170	185
KEYPOINT	53	USED FOR KEYPOINT(S)	172	189
KEYPOINT	54	USED FOR KEYPOINT(S)	188	
KEYPOINT	55	USED FOR KEYPOINT(S)	190	
KEYPOINT	73	USED FOR KEYPOINT(S)	98	
KEYPOINT	76	USED FOR KEYPOINT(S)	99	
KEYPOINT	78	USED FOR KEYPOINT(S)	103	
KEYPOINT	80	USED FOR KEYPOINT(S)	105	
KEYPOINT	84	USED FOR KEYPOINT(S)	110	
KEYPOINT	86	USED FOR KEYPOINT(S)	111	
KEYPOINT	88	USED FOR KEYPOINT(S)	115	
KEYPOINT	90	USED FOR KEYPOINT(S)	117	
KEYPOINT	93	USED FOR KEYPOINT(S)	122	
KEYPOINT	95	USED FOR KEYPOINT(S)	123	
KEYPOINT	96	USED FOR KEYPOINT(S)	127	
KEYPOINT	97	USED FOR KEYPOINT(S)	129	
KEYPOINT	101	USED FOR KEYPOINT(S)	136	
KEYPOINT	102	USED FOR KEYPOINT(S)	133	
KEYPOINT	104	USED FOR KEYPOINT(S)	134	
KEYPOINT	108	USED FOR KEYPOINT(S)	138	
KEYPOINT	113	USED FOR KEYPOINT(S)	144	
KEYPOINT	114	USED FOR KEYPOINT(S)	141	

KEYPOINT 116 USED FOR KEYPOINT(S) 142
 KEYPOINT 120 USED FOR KEYPOINT(S) 146
 KEYPOINT 125 USED FOR KEYPOINT(S) 152
 KEYPOINT 126 USED FOR KEYPOINT(S) 149
 KEYPOINT 128 USED FOR KEYPOINT(S) 150
 KEYPOINT 130 USED FOR KEYPOINT(S) 154
 KEYPOINT 132 USED FOR KEYPOINT(S) 155
 KEYPOINT 135 USED FOR KEYPOINT(S) 156
 KEYPOINT 137 USED FOR KEYPOINT(S) 159
 KEYPOINT 140 USED FOR KEYPOINT(S) 161
 KEYPOINT 143 USED FOR KEYPOINT(S) 162
 KEYPOINT 145 USED FOR KEYPOINT(S) 165
 KEYPOINT 151 USED FOR KEYPOINT(S) 168
 KEYPOINT 157 USED FOR KEYPOINT(S) 174
 KEYPOINT 158 USED FOR KEYPOINT(S) 173
 KEYPOINT 160 USED FOR KEYPOINT(S) 177
 KEYPOINT 163 USED FOR KEYPOINT(S) 180
 KEYPOINT 164 USED FOR KEYPOINT(S) 179
 KEYPOINT 166 USED FOR KEYPOINT(S) 183
 KEYPOINT 169 USED FOR KEYPOINT(S) 186
 LINE 40 USED FOR LINE(S) 290
 LINE 41 USED FOR LINE(S) 310
 LINE 42 USED FOR LINE(S) 330
 LINE 74 USED FOR LINE(S) 329

*** WARNING *** CP= 12.800 TIME= 10:45:10
 Unmeshed line 329 is merged into meshed line 74.
 LINE 75 USED FOR LINE(S) 347

*** WARNING *** CP= 12.800 TIME= 10:45:10
 Unmeshed line 347 is merged into meshed line 75.
 LINE 76 USED FOR LINE(S) 382

*** WARNING *** CP= 12.800 TIME= 10:45:10
 Unmeshed line 382 is merged into meshed line 76.
 LINE 77 USED FOR LINE(S) 385

*** WARNING *** CP= 12.810 TIME= 10:45:10
 Unmeshed line 385 is merged into meshed line 77.
 LINE 78 USED FOR LINE(S) 421

*** WARNING *** CP= 12.810 TIME= 10:45:10
 Unmeshed line 421 is merged into meshed line 78.
 LINE 79 USED FOR LINE(S) 424

*** WARNING *** CP= 12.810 TIME= 10:45:10
 Unmeshed line 424 is merged into meshed line 79.

LINE 120 USED FOR LINE(S) 207
 LINE 126 USED FOR LINE(S) 206
 LINE 127 USED FOR LINE(S) 211
 LINE 136 USED FOR LINE(S) 224
 LINE 138 USED FOR LINE(S) 221
 LINE 140 USED FOR LINE(S) 237
 LINE 146 USED FOR LINE(S) 233
 LINE 147 USED FOR LINE(S) 245
 LINE 156 USED FOR LINE(S) 250
 LINE 159 USED FOR LINE(S) 247
 LINE 162 USED FOR LINE(S) 251
 LINE 169 USED FOR LINE(S) 258
 LINE 170 USED FOR LINE(S) 257
 LINE 175 USED FOR LINE(S) 263
 LINE 177 USED FOR LINE(S) 262
 LINE 178 USED FOR LINE(S) 267
 LINE 183 USED FOR LINE(S) 270
 LINE 184 USED FOR LINE(S) 269
 LINE 189 USED FOR LINE(S) 271
 LINE 195 USED FOR LINE(S) 278
 LINE 196 USED FOR LINE(S) 277
 LINE 198 USED FOR LINE(S) 283
 LINE 199 USED FOR LINE(S) 282

LINE	200	USED	FOR	LINE(S)	287
LINE	213	USED	FOR	LINE(S)	300
LINE	218	USED	FOR	LINE(S)	301
LINE	219	USED	FOR	LINE(S)	293
LINE	225	USED	FOR	LINE(S)	294
LINE	226	USED	FOR	LINE(S)	295
LINE	238	USED	FOR	LINE(S)	308
LINE	239	USED	FOR	LINE(S)	305
LINE	246	USED	FOR	LINE(S)	306
LINE	253	USED	FOR	LINE(S)	320
LINE	254	USED	FOR	LINE(S)	321
LINE	255	USED	FOR	LINE(S)	313
LINE	259	USED	FOR	LINE(S)	314
LINE	260	USED	FOR	LINE(S)	315
LINE	264	USED	FOR	LINE(S)	328
LINE	265	USED	FOR	LINE(S)	325
LINE	268	USED	FOR	LINE(S)	326
LINE	273	USED	FOR	LINE(S)	340
LINE	274	USED	FOR	LINE(S)	341
LINE	275	USED	FOR	LINE(S)	333
LINE	279	USED	FOR	LINE(S)	334
LINE	280	USED	FOR	LINE(S)	335
LINE	284	USED	FOR	LINE(S)	348
LINE	285	USED	FOR	LINE(S)	345
LINE	288	USED	FOR	LINE(S)	346
LINE	291	USED	FOR	LINE(S)	350
LINE	297	USED	FOR	LINE(S)	349
LINE	298	USED	FOR	LINE(S)	351
LINE	302	USED	FOR	LINE(S)	357
LINE	303	USED	FOR	LINE(S)	358
LINE	311	USED	FOR	LINE(S)	363
LINE	317	USED	FOR	LINE(S)	362
LINE	318	USED	FOR	LINE(S)	364
LINE	322	USED	FOR	LINE(S)	370
LINE	323	USED	FOR	LINE(S)	371
LINE	331	USED	FOR	LINE(S)	376
LINE	337	USED	FOR	LINE(S)	375
LINE	338	USED	FOR	LINE(S)	377
LINE	342	USED	FOR	LINE(S)	383
LINE	343	USED	FOR	LINE(S)	384
LINE	353	USED	FOR	LINE(S)	390
LINE	354	USED	FOR	LINE(S)	388
LINE	355	USED	FOR	LINE(S)	389
LINE	360	USED	FOR	LINE(S)	397
LINE	361	USED	FOR	LINE(S)	396
LINE	366	USED	FOR	LINE(S)	403
LINE	367	USED	FOR	LINE(S)	401
LINE	368	USED	FOR	LINE(S)	402
LINE	373	USED	FOR	LINE(S)	410
LINE	374	USED	FOR	LINE(S)	409
LINE	379	USED	FOR	LINE(S)	416
LINE	380	USED	FOR	LINE(S)	414
LINE	381	USED	FOR	LINE(S)	415
LINE	386	USED	FOR	LINE(S)	423
LINE	387	USED	FOR	LINE(S)	422
AREA	62	USED	FOR	AREA(S)	169
AREA	78	USED	FOR	AREA(S)	174
AREA	91	USED	FOR	AREA(S)	178
AREA	100	USED	FOR	AREA(S)	182
AREA	112	USED	FOR	AREA(S)	185
AREA	126	USED	FOR	AREA(S)	190
AREA	139	USED	FOR	AREA(S)	194
AREA	148	USED	FOR	AREA(S)	198
AREA	158	USED	FOR	AREA(S)	201
AREA	162	USED	FOR	AREA(S)	206
AREA	165	USED	FOR	AREA(S)	210
AREA	167	USED	FOR	AREA(S)	214
AREA	171	USED	FOR	AREA(S)	224
AREA	175	USED	FOR	AREA(S)	219
AREA	179	USED	FOR	AREA(S)	231

AREA 183 USED FOR AREA(S) 228
 AREA 187 USED FOR AREA(S) 240
 AREA 191 USED FOR AREA(S) 235
 AREA 195 USED FOR AREA(S) 247
 AREA 199 USED FOR AREA(S) 244
 AREA 203 USED FOR AREA(S) 256
 AREA 207 USED FOR AREA(S) 251
 AREA 211 USED FOR AREA(S) 263
 AREA 215 USED FOR AREA(S) 260
 AREA 222 USED FOR AREA(S) 265
 AREA 226 USED FOR AREA(S) 270
 AREA 238 USED FOR AREA(S) 274
 AREA 242 USED FOR AREA(S) 279
 AREA 254 USED FOR AREA(S) 283
 AREA 258 USED FOR AREA(S) 288
 AREA 267 USED FOR AREA(S) 292
 AREA 272 USED FOR AREA(S) 297
 AREA 276 USED FOR AREA(S) 301
 AREA 281 USED FOR AREA(S) 306
 AREA 285 USED FOR AREA(S) 310
 AREA 290 USED FOR AREA(S) 315

Extrude 2-D WP Ends into 3-D Space
 (V's 81 - 89)

Bottom WP Area

DRAG AREAS
 30, 31, 32,
 ALONG LINES
 37, 38, 39,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT 22 USED FOR KEYPOINT(S) 98
 KEYPOINT 23 USED FOR KEYPOINT(S) 117
 KEYPOINT 24 USED FOR KEYPOINT(S) 134
 LINE 37 USED FOR LINE(S) 207
 LINE 38 USED FOR LINE(S) 270
 LINE 39 USED FOR LINE(S) 310
 (V's 90 - 101)

Top WP Area

DRAG AREAS
 27, 28, 29,
 ALONG LINES
 43, 44, 45, 46,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT 28 USED FOR KEYPOINT(S) 98
 KEYPOINT 29 USED FOR KEYPOINT(S) 150
 KEYPOINT 30 USED FOR KEYPOINT(S) 161
 KEYPOINT 31 USED FOR KEYPOINT(S) 172
 LINE 43 USED FOR LINE(S) 270
 LINE 44 USED FOR LINE(S) 371
 LINE 45 USED FOR LINE(S) 409
 LINE 46 USED FOR LINE(S) 434

Mesh Volumes - which are solid volumes - leave gaps to last
 Glass First

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
 PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 5

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
 IN VOLUMES 1 TO 4 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
 MAXIMUM NODE NUMBER = 846

MAXIMUM ELEMENT NUMBER = 1072

GENERATE NODES AND ELEMENTS
IN VOLUMES 33 TO 36 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 960
MAXIMUM ELEMENT NUMBER = 1168
SS in Pour Can.

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 5 TO 8 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1017
MAXIMUM ELEMENT NUMBER = 1216

GENERATE NODES AND ELEMENTS
IN VOLUMES 9 TO 16 IN STEPS OF 1

*** WARNING *** CP= 17.540 TIME= 10:45:15
Meshing of area 58 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.540 TIME= 10:45:15
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.580 TIME= 10:45:15
Meshing of area 60 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.580 TIME= 10:45:15
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.680 TIME= 10:45:15
Meshing of area 64 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.680 TIME= 10:45:15
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.780 TIME= 10:45:15
Meshing of area 68 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.780 TIME= 10:45:15
Worst aspect ratio is 52.4561404 : 1.

NUMBER OF VOLUMES MESHED = 8
MAXIMUM NODE NUMBER = 1081
MAXIMUM ELEMENT NUMBER = 1280

GENERATE NODES AND ELEMENTS
IN VOLUMES 41 TO 44 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1195
MAXIMUM ELEMENT NUMBER = 1328

GENERATE NODES AND ELEMENTS
IN VOLUMES 45 TO 56 IN STEPS OF 1

*** WARNING *** CP= 19.290 TIME= 10:45:16
Meshing of area 170 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.290 TIME= 10:45:16
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.320 TIME= 10:45:16
Meshing of area 172 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.320 TIME= 10:45:16
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.410 TIME= 10:45:16
Meshing of area 176 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.410 TIME= 10:45:16
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.490 TIME= 10:45:17
Meshing of area 180 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.490 TIME= 10:45:17
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.640 TIME= 10:45:17
Meshing of area 186 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.640 TIME= 10:45:17
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.680 TIME= 10:45:17
Meshing of area 188 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.680 TIME= 10:45:17
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.780 TIME= 10:45:17
Meshing of area 192 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.780 TIME= 10:45:17
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.880 TIME= 10:45:17
Meshing of area 196 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.880 TIME= 10:45:17
Worst aspect ratio is 29.1947368 : 1.

NUMBER OF VOLUMES MESHED = 12
MAXIMUM NODE NUMBER = 1291
MAXIMUM ELEMENT NUMBER = 1408
In. Bar. Material for WP

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 25 TO 28 IN STEPS OF 1

*** WARNING *** CP= 20.510 TIME= 10:45:18
Meshing of area 122 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.510 TIME= 10:45:18
Worst aspect ratio is 49.8333333 : 1.

*** WARNING *** CP= 20.560 TIME= 10:45:18
Meshing of area 124 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.560 TIME= 10:45:18
Worst aspect ratio is 49.8333333 : 1.

*** WARNING *** CP= 20.690 TIME= 10:45:18
Meshing of area 127 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.690 TIME= 10:45:18
Worst aspect ratio is 49.8333333 : 1.

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1393
MAXIMUM ELEMENT NUMBER = 1472

GENERATE NODES AND ELEMENTS
IN VOLUMES 69 TO 74 IN STEPS OF 1

*** WARNING *** CP= 21.340 TIME= 10:45:18
Meshing of area 266 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.340 TIME= 10:45:18
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.380 TIME= 10:45:18
Meshing of area 268 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.380 TIME= 10:45:18
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.490 TIME= 10:45:19
Meshing of area 271 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.490 TIME= 10:45:19
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.630 TIME= 10:45:19
Meshing of area 275 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.630 TIME= 10:45:19
Worst aspect ratio is 27.735 : 1.

*** WARNING *** CP= 21.670 TIME= 10:45:19
Meshing of area 277 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.670 TIME= 10:45:19
Worst aspect ratio is 27.735 : 1.

*** WARNING *** CP= 21.780 TIME= 10:45:19
Meshing of area 280 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.780 TIME= 10:45:19
Worst aspect ratio is 27.735 : 1.

NUMBER OF VOLUMES MESHED = 6
MAXIMUM NODE NUMBER = 1522
MAXIMUM ELEMENT NUMBER = 1552

GENERATE NODES AND ELEMENTS
IN VOLUMES 82 TO 82 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 1576
MAXIMUM ELEMENT NUMBER = 1584

GENERATE NODES AND ELEMENTS
IN VOLUMES 84 TO 85 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 1786
MAXIMUM ELEMENT NUMBER = 1712

GENERATE NODES AND ELEMENTS
IN VOLUMES 91 TO 91 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 1867
MAXIMUM ELEMENT NUMBER = 1760

GENERATE NODES AND ELEMENTS
IN VOLUMES 93 TO 94 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 2077
MAXIMUM ELEMENT NUMBER = 1888

Out. Bar. Material for WP

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 29 TO 32 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2145
MAXIMUM ELEMENT NUMBER = 1952

GENERATE NODES AND ELEMENTS
IN VOLUMES 75 TO 80 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 6
MAXIMUM NODE NUMBER = 2231
MAXIMUM ELEMENT NUMBER = 2032

GENERATE NODES AND ELEMENTS
IN VOLUMES 83 TO 83 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 2267
MAXIMUM ELEMENT NUMBER = 2064

GENERATE NODES AND ELEMENTS
IN VOLUMES 86 TO 89 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2497
MAXIMUM ELEMENT NUMBER = 2256

GENERATE NODES AND ELEMENTS
IN VOLUMES 92 TO 95 IN STEPS OF 3

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 2587
MAXIMUM ELEMENT NUMBER = 2336

GENERATE NODES AND ELEMENTS
IN VOLUMES 98 TO 101 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2905
MAXIMUM ELEMENT NUMBER = 2528

DONT MESH OR ASSIGN MAT. ASSUME VOID SPACES
AND NO RADIATION TRANSFER IN THESE SPACES
He/Air in Pour Can.

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 37, 40,1

He/Air in WP I/O Bar. Gap - NO RADIATION

ESHAPE,2,
MAT, 7,

TYPE,2,
VMESH, 96, 97,1

Clear 2-D mesh

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 1 TO 1 STEP 1

22 AREAS (OF 366 DEFINED) SELECTED BY ASEL COMMAND.

CLEAR NODES AND ELEMENTS FROM ALL SELECTED AREAS

*** NOTE *** CP= 28.580 TIME= 10:45:26
Nodes cannot be cleared from area 1 because volume 1 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.580 TIME= 10:45:26
Nodes cannot be cleared from area 2 because volume 2 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.590 TIME= 10:45:26
Nodes cannot be cleared from area 3 because volume 3 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.590 TIME= 10:45:26
Nodes cannot be cleared from area 4 because volume 4 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.600 TIME= 10:45:26
Nodes cannot be cleared from area 5 because volume 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.600 TIME= 10:45:26
Nodes cannot be cleared from area 6 because volume 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.610 TIME= 10:45:26
Nodes cannot be cleared from area 7 because volume 11 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.610 TIME= 10:45:26
Nodes cannot be cleared from area 8 because volume 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.630 TIME= 10:45:26
Nodes cannot be cleared from area 13 because volume 25 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.630 TIME= 10:45:26
Nodes cannot be cleared from area 14 because volume 26 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.630 TIME= 10:45:26
Nodes cannot be cleared from area 15 because volume 29 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.640 TIME= 10:45:26
Nodes cannot be cleared from area 16 because volume 30 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.660 TIME= 10:45:26
Nodes cannot be cleared from area 28 because volume 91 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.670 TIME= 10:45:26
Nodes cannot be cleared from area 29 because volume 92 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.700 TIME= 10:45:26
Nodes cannot be cleared from area 31 because volume 82 is meshed. Only

elements are deleted.

*** NOTE *** CP= 28.710 TIME= 10:45:26
Nodes cannot be cleared from area 32 because volume 83 is meshed. Only elements are deleted.

CLEARED 22 AREAS, 10 LINES, 3 KEYPOINTS

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 366 STEP 1

366 AREAS (OF 366 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 2528 STEP 1

2240 ELEMENTS (OF 2240 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 2905 STEP 1

2778 NODES (OF 2778 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 101 STEP 1

101 VOLUMES (OF 101 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 448 STEP 1

444 LINES (OF 444 DEFINED) SELECTED BY LSEL COMMAND.

MERGE IDENTICAL ELEMENTS

ZERO ELEMENTS WERE MERGED

MERGE COINCIDENT NODES WITHIN TOLERANCE OF .10000E-03

NODE 498	USED FOR NODES	1516
NODE 595	USED FOR NODES	1387
NODE 560	USED FOR NODES	1522
NODE 657	USED FOR NODES	1393
NODE 552	USED FOR NODES	1517
NODE 649	USED FOR NODES	1388
NODE 578	USED FOR NODES	2231
NODE 675	USED FOR NODES	2145
NODE 667	USED FOR NODES	2140
NODE 570	USED FOR NODES	2226
NODE 497	USED FOR NODES	1515
NODE 594	USED FOR NODES	1386
NODE 559	USED FOR NODES	1521
NODE 656	USED FOR NODES	1392
NODE 551	USED FOR NODES	1518
NODE 648	USED FOR NODES	1389
NODE 577	USED FOR NODES	2230
NODE 674	USED FOR NODES	2144
NODE 569	USED FOR NODES	2227
NODE 666	USED FOR NODES	2141
NODE 496	USED FOR NODES	1514
NODE 593	USED FOR NODES	1385
NODE 558	USED FOR NODES	1520
NODE 655	USED FOR NODES	1391
NODE 550	USED FOR NODES	1519
NODE 647	USED FOR NODES	1390
NODE 576	USED FOR NODES	2229
NODE 673	USED FOR NODES	2143
NODE 568	USED FOR NODES	2228
NODE 665	USED FOR NODES	2142
NODE 495	USED FOR NODES	1502
NODE 592	USED FOR NODES	1373

NODE 557 USED FOR NODES 1507
 NODE 654 USED FOR NODES 1378
 NODE 549 USED FOR NODES 1506
 NODE 646 USED FOR NODES 1377
 NODE 575 USED FOR NODES 2219
 NODE 672 USED FOR NODES 2133
 NODE 567 USED FOR NODES 2218
 NODE 664 USED FOR NODES 2132
 NODE 494 USED FOR NODES 1505
 NODE 591 USED FOR NODES 1376
 NODE 556 USED FOR NODES 1513
 NODE 653 USED FOR NODES 1384
 NODE 548 USED FOR NODES 1508
 NODE 645 USED FOR NODES 1379
 NODE 574 USED FOR NODES 2225
 NODE 671 USED FOR NODES 2139
 NODE 663 USED FOR NODES 2134
 NODE 566 USED FOR NODES 2220
 NODE 493 USED FOR NODES 1504
 NODE 590 USED FOR NODES 1375
 NODE 555 USED FOR NODES 1512
 NODE 652 USED FOR NODES 1383
 NODE 547 USED FOR NODES 1509
 NODE 644 USED FOR NODES 1380
 NODE 573 USED FOR NODES 2224
 NODE 670 USED FOR NODES 2138
 NODE 492 USED FOR NODES 1503
 NODE 589 USED FOR NODES 1374
 NODE 554 USED FOR NODES 1511
 NODE 651 USED FOR NODES 1382
 NODE 546 USED FOR NODES 1510
 NODE 643 USED FOR NODES 1381
 NODE 565 USED FOR NODES 2221
 NODE 662 USED FOR NODES 2135
 NODE 572 USED FOR NODES 2223
 NODE 669 USED FOR NODES 2137
 NODE 564 USED FOR NODES 2222
 NODE 661 USED FOR NODES 2136

*** WARNING *** CP= 30.150 TIME= 10:45:27
 Same node numbers associated with more than one solid model entity.
 Future mesh clearing operations could produce unexpected results.
 NUMMRG,KP could correct this problem.

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

 Rotate this set into the other quadrants about the Z axis
 (V's 102 - 404)

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)
 (V's 102 - 202)

GENERATE 2 TOTAL SETS OF VOLUMES
 SET IS FROM 1 TO 101 IN STEPS OF 1
 DX,DY,DZ= .000E+00 90.0 .000E+00 CSYS= 11

MAXIMUM NODE NUMBER = 5273
 MAXIMUM ELEMENT NUMBER = 4128
 (V's 203 - 303)

GENERATE 2 TOTAL SETS OF VOLUMES
 SET IS FROM 1 TO 101 IN STEPS OF 1
 DX,DY,DZ= .000E+00 180. .000E+00 CSYS= 11

MAXIMUM NODE NUMBER = 7641
 MAXIMUM ELEMENT NUMBER = 5728
 (V's 304 - 404)

GENERATE 2 TOTAL SETS OF VOLUMES
SET IS FROM 1 TO 101 IN STEPS OF 1
DX,DY,DZ= .000E+00 270. .000E+00 CSYS= 11

MAXIMUM NODE NUMBER = 10009
MAXIMUM ELEMENT NUMBER = 7328

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

MERGE IDENTICAL ELEMENTS

ZERO ELEMENTS WERE MERGED

MERGE COINCIDENT NODES WITHIN TOLERANCE OF .10000E-03

NODE 3488	USED FOR NODES	5848
NODE 4099	USED FOR NODES	6471
NODE 4100	USED FOR NODES	6472
NODE 4539	USED FOR NODES	6911
NODE 4540	USED FOR NODES	6912
NODE 4037	USED FOR NODES	6397
NODE 5238	USED FOR NODES	7610
NODE 5239	USED FOR NODES	7611
NODE 4011	USED FOR NODES	6363
NODE 4012	USED FOR NODES	6364
NODE 3446	USED FOR NODES	5782
NODE 4920	USED FOR NODES	7292
NODE 4656	USED FOR NODES	7030
NODE 4657	USED FOR NODES	7031
NODE 4974	USED FOR NODES	7346
NODE 4345	USED FOR NODES	6717
NODE 4346	USED FOR NODES	6718
NODE 3448	USED FOR NODES	5786
NODE 3449	USED FOR NODES	5787
NODE 3450	USED FOR NODES	5788
NODE 4658	USED FOR NODES	7032
NODE 3975	USED FOR NODES	6327
NODE 3976	USED FOR NODES	6328
NODE 4921	USED FOR NODES	7293
NODE 4975	USED FOR NODES	7347
NODE 4660	USED FOR NODES	7055
NODE 3453	USED FOR NODES	5801
NODE 3452	USED FOR NODES	5800
NODE 4102	USED FOR NODES	6488
NODE 4014	USED FOR NODES	6372
NODE 4923	USED FOR NODES	7309
NODE 3978	USED FOR NODES	6336
NODE 4348	USED FOR NODES	6734
NODE 4541	USED FOR NODES	6927
NODE 4013	USED FOR NODES	6371
NODE 5240	USED FOR NODES	7626
NODE 3447	USED FOR NODES	5798
NODE 4038	USED FOR NODES	6401
NODE 4976	USED FOR NODES	7362
NODE 4659	USED FOR NODES	7054
NODE 4347	USED FOR NODES	6733
NODE 3489	USED FOR NODES	5852
NODE 3451	USED FOR NODES	5799
NODE 3977	USED FOR NODES	6335
NODE 4977	USED FOR NODES	7363
NODE 4101	USED FOR NODES	6487
NODE 4922	USED FOR NODES	7308
NODE 4661	USED FOR NODES	7056
NODE 5241	USED FOR NODES	7627
NODE 4542	USED FOR NODES	6928
NODE 3350	USED FOR NODES	5672
NODE 4603	USED FOR NODES	6977
NODE 5195	USED FOR NODES	7567
NODE 3398	USED FOR NODES	5754
NODE 4064	USED FOR NODES	6436
NODE 4884	USED FOR NODES	7256

NODE	3947	USED FOR NODES	6303
NODE	4885	USED FOR NODES	7257
NODE	3347	USED FOR NODES	5667
NODE	3858	USED FOR NODES	6202
NODE	4503	USED FOR NODES	6875
NODE	4504	USED FOR NODES	6876
NODE	4063	USED FOR NODES	6435
NODE	4958	USED FOR NODES	7324
NODE	4966	USED FOR NODES	7325
NODE	3859	USED FOR NODES	6203
NODE	4602	USED FOR NODES	6976
NODE	4309	USED FOR NODES	6681
NODE	4310	USED FOR NODES	6682
NODE	3349	USED FOR NODES	5671
NODE	5194	USED FOR NODES	7566
NODE	3912	USED FOR NODES	6256
NODE	3913	USED FOR NODES	6257
NODE	3351	USED FOR NODES	5673
NODE	4604	USED FOR NODES	6978
NODE	3354	USED FOR NODES	5686
NODE	4606	USED FOR NODES	7001
NODE	3861	USED FOR NODES	6211
NODE	4312	USED FOR NODES	6698
NODE	4887	USED FOR NODES	7273
NODE	4066	USED FOR NODES	6452
NODE	3353	USED FOR NODES	5685
NODE	5197	USED FOR NODES	7584
NODE	5196	USED FOR NODES	7583
NODE	4505	USED FOR NODES	6891
NODE	3860	USED FOR NODES	6210
NODE	3948	USED FOR NODES	6307
NODE	4886	USED FOR NODES	7272
NODE	3399	USED FOR NODES	5758
NODE	4506	USED FOR NODES	6892
NODE	3348	USED FOR NODES	5683
NODE	4311	USED FOR NODES	6697
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NODE	1870	USED	FOR	NODES	9493
NODE	1589	USED	FOR	NODES	8925
NODE	2308	USED	FOR	NODES	9156
NODE	2645	USED	FOR	NODES	9802
NODE	2664	USED	FOR	NODES	9815
NODE	2646	USED	FOR	NODES	9801
NODE	1590	USED	FOR	NODES	8924
NODE	2309	USED	FOR	NODES	9155
NODE	1881	USED	FOR	NODES	9499
NODE	1889	USED	FOR	NODES	9506
NODE	2317	USED	FOR	NODES	9162
NODE	2656	USED	FOR	NODES	9808
NODE	1580	USED	FOR	NODES	8917
NODE	1598	USED	FOR	NODES	8931
NODE	1871	USED	FOR	NODES	9492
NODE	2657	USED	FOR	NODES	9807
NODE	2665	USED	FOR	NODES	9814
NODE	2318	USED	FOR	NODES	9161
NODE	1591	USED	FOR	NODES	8923
NODE	1581	USED	FOR	NODES	8916
NODE	1872	USED	FOR	NODES	9491
NODE	1882	USED	FOR	NODES	9498
NODE	1599	USED	FOR	NODES	8930
NODE	1890	USED	FOR	NODES	9505
NODE	2310	USED	FOR	NODES	9154
NODE	2647	USED	FOR	NODES	9800
NODE	2319	USED	FOR	NODES	9160
NODE	2666	USED	FOR	NODES	9813
NODE	2311	USED	FOR	NODES	9153
NODE	2648	USED	FOR	NODES	9799
NODE	1582	USED	FOR	NODES	8915
NODE	1883	USED	FOR	NODES	9497
NODE	1592	USED	FOR	NODES	8922
NODE	2658	USED	FOR	NODES	9806
NODE	1873	USED	FOR	NODES	9490
NODE	1600	USED	FOR	NODES	8929
NODE	1891	USED	FOR	NODES	9504
NODE	2667	USED	FOR	NODES	9812
NODE	1884	USED	FOR	NODES	9496
NODE	2649	USED	FOR	NODES	9798
NODE	2312	USED	FOR	NODES	9152
NODE	2320	USED	FOR	NODES	9159
NODE	1892	USED	FOR	NODES	9503
NODE	1601	USED	FOR	NODES	8928
NODE	1593	USED	FOR	NODES	8921
NODE	1583	USED	FOR	NODES	8914
NODE	2659	USED	FOR	NODES	9805
NODE	1874	USED	FOR	NODES	9489
NODE	1893	USED	FOR	NODES	9502
NODE	1602	USED	FOR	NODES	8927
NODE	2668	USED	FOR	NODES	9811
NODE	2313	USED	FOR	NODES	9151
NODE	1885	USED	FOR	NODES	9495
NODE	1584	USED	FOR	NODES	8913
NODE	1875	USED	FOR	NODES	9488
NODE	1594	USED	FOR	NODES	8920
NODE	2321	USED	FOR	NODES	9158

NODE	2650	USED FOR NODES	9797
NODE	2660	USED FOR NODES	9804
NODE	1295	USED FOR NODES	8071
NODE	1450	USED FOR NODES	8640
NODE	1454	USED FOR NODES	8641
NODE	1400	USED FOR NODES	8587
NODE	1396	USED FOR NODES	8586
NODE	1586	USED FOR NODES	8898
NODE	1299	USED FOR NODES	8072
NODE	1877	USED FOR NODES	9473
NODE	1300	USED FOR NODES	8073
NODE	483	USED FOR NODES	8679
NODE	2651	USED FOR NODES	9781
NODE	1876	USED FOR NODES	9472
NODE	2643	USED FOR NODES	9773
NODE	580	USED FOR NODES	8130
NODE	1525	USED FOR NODES	8781
NODE	2652	USED FOR NODES	9782
NODE	75	USED FOR NODES	8067
NODE	1790	USED FOR NODES	9311
NODE	1798	USED FOR NODES	9312
NODE	1799	USED FOR NODES	9313
NODE	2304	USED FOR NODES	9135
NODE	1533	USED FOR NODES	8782
NODE	2305	USED FOR NODES	9136
NODE	1585	USED FOR NODES	8897
NODE	1471	USED FOR NODES	8651
NODE	1562	USED FOR NODES	8802
NODE	1772	USED FOR NODES	9048
NODE	1846	USED FOR NODES	9343
NODE	1417	USED FOR NODES	8597
NODE	1845	USED FOR NODES	9342
NODE	2063	USED FOR NODES	9623
NODE	2847	USED FOR NODES	9932
NODE	650	USED FOR NODES	8135
NODE	1416	USED FOR NODES	8596
NODE	553	USED FOR NODES	8684
NODE	1771	USED FOR NODES	9047
NODE	112	USED FOR NODES	8084
NODE	1470	USED FOR NODES	8650
NODE	1325	USED FOR NODES	8088
NODE	2446	USED FOR NODES	9241
NODE	2062	USED FOR NODES	9622
NODE	2846	USED FOR NODES	9929
NODE	2848	USED FOR NODES	9933
NODE	1844	USED FOR NODES	9341
NODE	2447	USED FOR NODES	9242
NODE	1561	USED FOR NODES	8801
NODE	1326	USED FOR NODES	8089
NODE	1327	USED FOR NODES	8090
NODE	1545	USED FOR NODES	8799
NODE	545	USED FOR NODES	8683
NODE	1546	USED FOR NODES	8800
NODE	642	USED FOR NODES	8134
NODE	1313	USED FOR NODES	8085
NODE	2046	USED FOR NODES	9620
NODE	2047	USED FOR NODES	9621
NODE	1408	USED FOR NODES	8594
NODE	1409	USED FOR NODES	8595
NODE	1462	USED FOR NODES	8648
NODE	108	USED FOR NODES	8083
NODE	1463	USED FOR NODES	8649
NODE	2430	USED FOR NODES	9239
NODE	2588	USED FOR NODES	9694
NODE	2431	USED FOR NODES	9240
NODE	2830	USED FOR NODES	9930
NODE	1315	USED FOR NODES	8087
NODE	1756	USED FOR NODES	9046
NODE	1820	USED FOR NODES	9338
NODE	1822	USED FOR NODES	9340

NODE	2831	USED FOR NODES	9931
NODE	1755	USED FOR NODES	9045
NODE	2589	USED FOR NODES	9702
NODE	1314	USED FOR NODES	8086
NODE	1821	USED FOR NODES	9339
NODE	2530	USED FOR NODES	9397
NODE	2195	USED FOR NODES	8750
NODE	2627	USED FOR NODES	9713
NODE	2483	USED FOR NODES	9278
NODE	2891	USED FOR NODES	9977
NODE	2098	USED FOR NODES	8189
NODE	2289	USED FOR NODES	9084
NODE	2573	USED FOR NODES	9659
NODE	2159	USED FOR NODES	8714
NODE	2253	USED FOR NODES	8838
NODE	2572	USED FOR NODES	9658
NODE	2158	USED FOR NODES	8713
NODE	2626	USED FOR NODES	9712
NODE	668	USED FOR NODES	8225
NODE	2096	USED FOR NODES	8187
NODE	2890	USED FOR NODES	9976
NODE	571	USED FOR NODES	8774
NODE	130	USED FOR NODES	8183
NODE	2482	USED FOR NODES	9277
NODE	2252	USED FOR NODES	8837
NODE	2194	USED FOR NODES	8749
NODE	2528	USED FOR NODES	9395
NODE	2288	USED FOR NODES	9083
NODE	2529	USED FOR NODES	9396
NODE	2097	USED FOR NODES	8188
NODE	2086	USED FOR NODES	8186
NODE	2151	USED FOR NODES	8712
NODE	2187	USED FOR NODES	8748
NODE	2150	USED FOR NODES	8711
NODE	2084	USED FOR NODES	8184
NODE	2186	USED FOR NODES	8747
NODE	2085	USED FOR NODES	8185
NODE	2236	USED FOR NODES	8835
NODE	2237	USED FOR NODES	8836
NODE	2557	USED FOR NODES	9657
NODE	2875	USED FOR NODES	9975
NODE	2466	USED FOR NODES	9275
NODE	2467	USED FOR NODES	9276
NODE	2504	USED FOR NODES	9392
NODE	563	USED FOR NODES	8773
NODE	2505	USED FOR NODES	9393
NODE	660	USED FOR NODES	8224
NODE	2273	USED FOR NODES	9082
NODE	2272	USED FOR NODES	9081
NODE	2874	USED FOR NODES	9974
NODE	126	USED FOR NODES	8182
NODE	2610	USED FOR NODES	9710
NODE	2611	USED FOR NODES	9711
NODE	2506	USED FOR NODES	9394
NODE	2556	USED FOR NODES	9656

*** WARNING *** CP= 62.480 TIME= 10:46:00
 Same node numbers associated with more than one solid model entity.
 Future mesh clearing operations could produce unexpected results.
 NUMMRG,KP could correct this problem.

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03		
KEYPOINT	1 USED FOR KEYPOINT(S)	209 372 535
KEYPOINT	11 USED FOR KEYPOINT(S)	541
KEYPOINT	13 USED FOR KEYPOINT(S)	210
KEYPOINT	14 USED FOR KEYPOINT(S)	551
KEYPOINT	16 USED FOR KEYPOINT(S)	223
KEYPOINT	17 USED FOR KEYPOINT(S)	560
KEYPOINT	19 USED FOR KEYPOINT(S)	232
KEYPOINT	20 USED FOR KEYPOINT(S)	212 375 538

KEYPOINT	168	USED	FOR	KEYPOINT(S)	660
KEYPOINT	170	USED	FOR	KEYPOINT(S)	337
KEYPOINT	171	USED	FOR	KEYPOINT(S)	662
KEYPOINT	173	USED	FOR	KEYPOINT(S)	666
KEYPOINT	174	USED	FOR	KEYPOINT(S)	338
KEYPOINT	176	USED	FOR	KEYPOINT(S)	615
KEYPOINT	177	USED	FOR	KEYPOINT(S)	342
KEYPOINT	178	USED	FOR	KEYPOINT(S)	288
KEYPOINT	179	USED	FOR	KEYPOINT(S)	667
KEYPOINT	180	USED	FOR	KEYPOINT(S)	344
KEYPOINT	182	USED	FOR	KEYPOINT(S)	618
KEYPOINT	183	USED	FOR	KEYPOINT(S)	669
KEYPOINT	184	USED	FOR	KEYPOINT(S)	291
KEYPOINT	215	USED	FOR	KEYPOINT(S)	373
KEYPOINT	216	USED	FOR	KEYPOINT(S)	374
KEYPOINT	220	USED	FOR	KEYPOINT(S)	380
KEYPOINT	225	USED	FOR	KEYPOINT(S)	386
KEYPOINT	226	USED	FOR	KEYPOINT(S)	387
KEYPOINT	229	USED	FOR	KEYPOINT(S)	391
KEYPOINT	234	USED	FOR	KEYPOINT(S)	395
KEYPOINT	235	USED	FOR	KEYPOINT(S)	396
KEYPOINT	238	USED	FOR	KEYPOINT(S)	400
KEYPOINT	269	USED	FOR	KEYPOINT(S)	429
KEYPOINT	273	USED	FOR	KEYPOINT(S)	433
KEYPOINT	277	USED	FOR	KEYPOINT(S)	437
KEYPOINT	280	USED	FOR	KEYPOINT(S)	442
KEYPOINT	283	USED	FOR	KEYPOINT(S)	445
KEYPOINT	286	USED	FOR	KEYPOINT(S)	448
KEYPOINT	289	USED	FOR	KEYPOINT(S)	451
KEYPOINT	292	USED	FOR	KEYPOINT(S)	454
KEYPOINT	295	USED	FOR	KEYPOINT(S)	457
KEYPOINT	298	USED	FOR	KEYPOINT(S)	459
KEYPOINT	299	USED	FOR	KEYPOINT(S)	463
KEYPOINT	301	USED	FOR	KEYPOINT(S)	465
KEYPOINT	305	USED	FOR	KEYPOINT(S)	466
KEYPOINT	306	USED	FOR	KEYPOINT(S)	470
KEYPOINT	308	USED	FOR	KEYPOINT(S)	472
KEYPOINT	312	USED	FOR	KEYPOINT(S)	473
KEYPOINT	313	USED	FOR	KEYPOINT(S)	477
KEYPOINT	315	USED	FOR	KEYPOINT(S)	479
KEYPOINT	319	USED	FOR	KEYPOINT(S)	480
KEYPOINT	320	USED	FOR	KEYPOINT(S)	484
KEYPOINT	322	USED	FOR	KEYPOINT(S)	486
KEYPOINT	326	USED	FOR	KEYPOINT(S)	487
KEYPOINT	327	USED	FOR	KEYPOINT(S)	491
KEYPOINT	329	USED	FOR	KEYPOINT(S)	493
KEYPOINT	333	USED	FOR	KEYPOINT(S)	494
KEYPOINT	334	USED	FOR	KEYPOINT(S)	498
KEYPOINT	336	USED	FOR	KEYPOINT(S)	500
KEYPOINT	340	USED	FOR	KEYPOINT(S)	501
KEYPOINT	341	USED	FOR	KEYPOINT(S)	505
KEYPOINT	343	USED	FOR	KEYPOINT(S)	507
KEYPOINT	378	USED	FOR	KEYPOINT(S)	536
KEYPOINT	379	USED	FOR	KEYPOINT(S)	537
KEYPOINT	383	USED	FOR	KEYPOINT(S)	543
KEYPOINT	388	USED	FOR	KEYPOINT(S)	549
KEYPOINT	389	USED	FOR	KEYPOINT(S)	550
KEYPOINT	392	USED	FOR	KEYPOINT(S)	554
KEYPOINT	397	USED	FOR	KEYPOINT(S)	558
KEYPOINT	398	USED	FOR	KEYPOINT(S)	559
KEYPOINT	401	USED	FOR	KEYPOINT(S)	563
KEYPOINT	432	USED	FOR	KEYPOINT(S)	592
KEYPOINT	436	USED	FOR	KEYPOINT(S)	596
KEYPOINT	440	USED	FOR	KEYPOINT(S)	600
KEYPOINT	443	USED	FOR	KEYPOINT(S)	605
KEYPOINT	446	USED	FOR	KEYPOINT(S)	608
KEYPOINT	449	USED	FOR	KEYPOINT(S)	611
KEYPOINT	452	USED	FOR	KEYPOINT(S)	614
KEYPOINT	455	USED	FOR	KEYPOINT(S)	617
KEYPOINT	458	USED	FOR	KEYPOINT(S)	620

KEYPOINT	461	USED FOR KEYPOINT(S)	622
KEYPOINT	462	USED FOR KEYPOINT(S)	626
KEYPOINT	464	USED FOR KEYPOINT(S)	628
KEYPOINT	468	USED FOR KEYPOINT(S)	629
KEYPOINT	469	USED FOR KEYPOINT(S)	633
KEYPOINT	471	USED FOR KEYPOINT(S)	635
KEYPOINT	475	USED FOR KEYPOINT(S)	636
KEYPOINT	476	USED FOR KEYPOINT(S)	640
KEYPOINT	478	USED FOR KEYPOINT(S)	642
KEYPOINT	482	USED FOR KEYPOINT(S)	643
KEYPOINT	483	USED FOR KEYPOINT(S)	647
KEYPOINT	485	USED FOR KEYPOINT(S)	649
KEYPOINT	489	USED FOR KEYPOINT(S)	650
KEYPOINT	490	USED FOR KEYPOINT(S)	654
KEYPOINT	492	USED FOR KEYPOINT(S)	656
KEYPOINT	496	USED FOR KEYPOINT(S)	657
KEYPOINT	497	USED FOR KEYPOINT(S)	661
KEYPOINT	499	USED FOR KEYPOINT(S)	663
KEYPOINT	503	USED FOR KEYPOINT(S)	664
KEYPOINT	504	USED FOR KEYPOINT(S)	668
KEYPOINT	506	USED FOR KEYPOINT(S)	670
LINE	21	USED FOR LINE(S)	511
LINE	22	USED FOR LINE(S)	1363
LINE	25	USED FOR LINE(S)	1385
LINE	27	USED FOR LINE(S)	549
LINE	30	USED FOR LINE(S)	1406
LINE	32	USED FOR LINE(S)	570
LINE	35	USED FOR LINE(S)	514 931 1348
LINE	36	USED FOR LINE(S)	533 950 1367
LINE	37	USED FOR LINE(S)	746 1163 1580
LINE	38	USED FOR LINE(S)	765 1182 1599
LINE	39	USED FOR LINE(S)	781 1198 1615
LINE	40	USED FOR LINE(S)	662 1079 1496
LINE	41	USED FOR LINE(S)	674 1091 1508
LINE	42	USED FOR LINE(S)	686 1103 1520
LINE	43	USED FOR LINE(S)	797 1214 1631
LINE	44	USED FOR LINE(S)	816 1233 1650
LINE	45	USED FOR LINE(S)	832 1249 1666
LINE	46	USED FOR LINE(S)	848 1265 1682
LINE	74	USED FOR LINE(S)	1529
LINE	75	USED FOR LINE(S)	685
LINE	76	USED FOR LINE(S)	1552
LINE	77	USED FOR LINE(S)	716
LINE	78	USED FOR LINE(S)	1576
LINE	79	USED FOR LINE(S)	740
LINE	83	USED FOR LINE(S)	1376
LINE	84	USED FOR LINE(S)	532
LINE	85	USED FOR LINE(S)	1396
LINE	86	USED FOR LINE(S)	560
LINE	87	USED FOR LINE(S)	1417
LINE	88	USED FOR LINE(S)	581
LINE	158	USED FOR LINE(S)	1364
LINE	160	USED FOR LINE(S)	1359
LINE	172	USED FOR LINE(S)	512
LINE	176	USED FOR LINE(S)	513
LINE	180	USED FOR LINE(S)	1373
LINE	192	USED FOR LINE(S)	531
LINE	204	USED FOR LINE(S)	1386
LINE	205	USED FOR LINE(S)	1387
LINE	206	USED FOR LINE(S)	1584
LINE	207	USED FOR LINE(S)	1635
LINE	208	USED FOR LINE(S)	550
LINE	209	USED FOR LINE(S)	547
LINE	211	USED FOR LINE(S)	1582
LINE	217	USED FOR LINE(S)	1395
LINE	222	USED FOR LINE(S)	558
LINE	224	USED FOR LINE(S)	744
LINE	230	USED FOR LINE(S)	1407
LINE	231	USED FOR LINE(S)	1408
LINE	233	USED FOR LINE(S)	745

LINE	234	USED FOR LINE(S)	571
LINE	235	USED FOR LINE(S)	568
LINE	237	USED FOR LINE(S)	756
LINE	243	USED FOR LINE(S)	1416
LINE	245	USED FOR LINE(S)	754
LINE	248	USED FOR LINE(S)	579
LINE	250	USED FOR LINE(S)	1585
LINE	251	USED FOR LINE(S)	1586
LINE	257	USED FOR LINE(S)	762
LINE	258	USED FOR LINE(S)	760
LINE	263	USED FOR LINE(S)	1591
LINE	267	USED FOR LINE(S)	1592
LINE	269	USED FOR LINE(S)	1602
LINE	271	USED FOR LINE(S)	1600
LINE	278	USED FOR LINE(S)	763
LINE	282	USED FOR LINE(S)	764
LINE	283	USED FOR LINE(S)	773
LINE	287	USED FOR LINE(S)	771
LINE	289	USED FOR LINE(S)	1505
LINE	291	USED FOR LINE(S)	1502
LINE	293	USED FOR LINE(S)	1603
LINE	294	USED FOR LINE(S)	1604
LINE	295	USED FOR LINE(S)	778
LINE	300	USED FOR LINE(S)	776
LINE	303	USED FOR LINE(S)	660
LINE	305	USED FOR LINE(S)	1608
LINE	306	USED FOR LINE(S)	1609
LINE	307	USED FOR LINE(S)	661
LINE	308	USED FOR LINE(S)	1618
LINE	309	USED FOR LINE(S)	1517
LINE	310	USED FOR LINE(S)	1633
LINE	311	USED FOR LINE(S)	1514
LINE	313	USED FOR LINE(S)	1616
LINE	315	USED FOR LINE(S)	779
LINE	320	USED FOR LINE(S)	780
LINE	321	USED FOR LINE(S)	789
LINE	323	USED FOR LINE(S)	672
LINE	325	USED FOR LINE(S)	787
LINE	327	USED FOR LINE(S)	673
LINE	328	USED FOR LINE(S)	1619
LINE	329	USED FOR LINE(S)	1620
LINE	330	USED FOR LINE(S)	794
LINE	331	USED FOR LINE(S)	1526
LINE	333	USED FOR LINE(S)	792
LINE	335	USED FOR LINE(S)	1624
LINE	340	USED FOR LINE(S)	1625
LINE	343	USED FOR LINE(S)	684
LINE	345	USED FOR LINE(S)	795
LINE	346	USED FOR LINE(S)	796
LINE	347	USED FOR LINE(S)	807
LINE	348	USED FOR LINE(S)	805
LINE	350	USED FOR LINE(S)	1636
LINE	351	USED FOR LINE(S)	1637
LINE	355	USED FOR LINE(S)	1535
LINE	356	USED FOR LINE(S)	1536
LINE	357	USED FOR LINE(S)	813
LINE	358	USED FOR LINE(S)	811
LINE	359	USED FOR LINE(S)	700
LINE	360	USED FOR LINE(S)	698
LINE	363	USED FOR LINE(S)	1642
LINE	364	USED FOR LINE(S)	1643
LINE	368	USED FOR LINE(S)	1543
LINE	369	USED FOR LINE(S)	1544
LINE	370	USED FOR LINE(S)	1653
LINE	372	USED FOR LINE(S)	708
LINE	373	USED FOR LINE(S)	706
LINE	375	USED FOR LINE(S)	1651
LINE	377	USED FOR LINE(S)	814
LINE	381	USED FOR LINE(S)	1551
LINE	382	USED FOR LINE(S)	815

LINE	383	USED	FOR	LINE(S)	824
LINE	384	USED	FOR	LINE(S)	822
LINE	386	USED	FOR	LINE(S)	714
LINE	388	USED	FOR	LINE(S)	1654
LINE	389	USED	FOR	LINE(S)	1655
LINE	390	USED	FOR	LINE(S)	829
LINE	394	USED	FOR	LINE(S)	1559
LINE	395	USED	FOR	LINE(S)	1560
LINE	396	USED	FOR	LINE(S)	827
LINE	398	USED	FOR	LINE(S)	724
LINE	399	USED	FOR	LINE(S)	722
LINE	401	USED	FOR	LINE(S)	1659
LINE	402	USED	FOR	LINE(S)	1660
LINE	403	USED	FOR	LINE(S)	1669
LINE	407	USED	FOR	LINE(S)	1567
LINE	408	USED	FOR	LINE(S)	1568
LINE	410	USED	FOR	LINE(S)	1667
LINE	411	USED	FOR	LINE(S)	732
LINE	412	USED	FOR	LINE(S)	730
LINE	415	USED	FOR	LINE(S)	830
LINE	416	USED	FOR	LINE(S)	831
LINE	420	USED	FOR	LINE(S)	1575
LINE	421	USED	FOR	LINE(S)	840
LINE	422	USED	FOR	LINE(S)	838
LINE	424	USED	FOR	LINE(S)	1670
LINE	425	USED	FOR	LINE(S)	738
LINE	427	USED	FOR	LINE(S)	1671
LINE	428	USED	FOR	LINE(S)	845
LINE	429	USED	FOR	LINE(S)	843
LINE	431	USED	FOR	LINE(S)	1675
LINE	432	USED	FOR	LINE(S)	1676
LINE	433	USED	FOR	LINE(S)	1685
LINE	435	USED	FOR	LINE(S)	1683
LINE	437	USED	FOR	LINE(S)	846
LINE	438	USED	FOR	LINE(S)	847
LINE	439	USED	FOR	LINE(S)	856
LINE	440	USED	FOR	LINE(S)	854
LINE	442	USED	FOR	LINE(S)	1686
LINE	443	USED	FOR	LINE(S)	1687
LINE	444	USED	FOR	LINE(S)	861
LINE	445	USED	FOR	LINE(S)	859
LINE	447	USED	FOR	LINE(S)	1691
LINE	448	USED	FOR	LINE(S)	1692
LINE	525	USED	FOR	LINE(S)	929
LINE	529	USED	FOR	LINE(S)	928
LINE	530	USED	FOR	LINE(S)	930
LINE	539	USED	FOR	LINE(S)	948
LINE	542	USED	FOR	LINE(S)	949
LINE	551	USED	FOR	LINE(S)	966
LINE	552	USED	FOR	LINE(S)	964
LINE	553	USED	FOR	LINE(S)	967
LINE	561	USED	FOR	LINE(S)	975
LINE	562	USED	FOR	LINE(S)	977
LINE	572	USED	FOR	LINE(S)	987
LINE	573	USED	FOR	LINE(S)	985
LINE	574	USED	FOR	LINE(S)	988
LINE	582	USED	FOR	LINE(S)	996
LINE	583	USED	FOR	LINE(S)	998
LINE	668	USED	FOR	LINE(S)	1077
LINE	671	USED	FOR	LINE(S)	1078
LINE	680	USED	FOR	LINE(S)	1089
LINE	683	USED	FOR	LINE(S)	1090
LINE	692	USED	FOR	LINE(S)	1101
LINE	695	USED	FOR	LINE(S)	1102
LINE	701	USED	FOR	LINE(S)	1115
LINE	702	USED	FOR	LINE(S)	1117
LINE	709	USED	FOR	LINE(S)	1123
LINE	710	USED	FOR	LINE(S)	1125
LINE	717	USED	FOR	LINE(S)	1131
LINE	718	USED	FOR	LINE(S)	1133

LINE	725	USED FOR LINE(S)	1139
LINE	726	USED FOR LINE(S)	1141
LINE	733	USED FOR LINE(S)	1147
LINE	734	USED FOR LINE(S)	1149
LINE	741	USED FOR LINE(S)	1155
LINE	742	USED FOR LINE(S)	1157
LINE	748	USED FOR LINE(S)	1161
LINE	750	USED FOR LINE(S)	1162
LINE	751	USED FOR LINE(S)	1171
LINE	752	USED FOR LINE(S)	1173
LINE	757	USED FOR LINE(S)	1177
LINE	758	USED FOR LINE(S)	1179
LINE	766	USED FOR LINE(S)	1180
LINE	768	USED FOR LINE(S)	1181
LINE	769	USED FOR LINE(S)	1188
LINE	770	USED FOR LINE(S)	1190
LINE	774	USED FOR LINE(S)	1193
LINE	775	USED FOR LINE(S)	1195
LINE	782	USED FOR LINE(S)	1196
LINE	784	USED FOR LINE(S)	1197
LINE	785	USED FOR LINE(S)	1204
LINE	786	USED FOR LINE(S)	1206
LINE	790	USED FOR LINE(S)	1209
LINE	791	USED FOR LINE(S)	1211
LINE	799	USED FOR LINE(S)	1212
LINE	801	USED FOR LINE(S)	1213
LINE	802	USED FOR LINE(S)	1222
LINE	803	USED FOR LINE(S)	1224
LINE	808	USED FOR LINE(S)	1228
LINE	809	USED FOR LINE(S)	1230
LINE	817	USED FOR LINE(S)	1231
LINE	819	USED FOR LINE(S)	1232
LINE	820	USED FOR LINE(S)	1239
LINE	821	USED FOR LINE(S)	1241
LINE	825	USED FOR LINE(S)	1244
LINE	826	USED FOR LINE(S)	1246
LINE	833	USED FOR LINE(S)	1247
LINE	835	USED FOR LINE(S)	1248
LINE	836	USED FOR LINE(S)	1255
LINE	837	USED FOR LINE(S)	1257
LINE	841	USED FOR LINE(S)	1260
LINE	842	USED FOR LINE(S)	1262
LINE	849	USED FOR LINE(S)	1263
LINE	851	USED FOR LINE(S)	1264
LINE	852	USED FOR LINE(S)	1271
LINE	853	USED FOR LINE(S)	1273
LINE	857	USED FOR LINE(S)	1276
LINE	858	USED FOR LINE(S)	1278
LINE	942	USED FOR LINE(S)	1346
LINE	946	USED FOR LINE(S)	1345
LINE	947	USED FOR LINE(S)	1347
LINE	956	USED FOR LINE(S)	1365
LINE	959	USED FOR LINE(S)	1366
LINE	968	USED FOR LINE(S)	1383
LINE	969	USED FOR LINE(S)	1381
LINE	970	USED FOR LINE(S)	1384
LINE	978	USED FOR LINE(S)	1392
LINE	979	USED FOR LINE(S)	1394
LINE	989	USED FOR LINE(S)	1404
LINE	990	USED FOR LINE(S)	1402
LINE	991	USED FOR LINE(S)	1405
LINE	999	USED FOR LINE(S)	1413
LINE	1000	USED FOR LINE(S)	1415
LINE	1085	USED FOR LINE(S)	1494
LINE	1088	USED FOR LINE(S)	1495
LINE	1097	USED FOR LINE(S)	1506
LINE	1100	USED FOR LINE(S)	1507
LINE	1109	USED FOR LINE(S)	1518
LINE	1112	USED FOR LINE(S)	1519
LINE	1118	USED FOR LINE(S)	1532

LINE	1119	USED FOR LINE(S)	1534
LINE	1126	USED FOR LINE(S)	1540
LINE	1127	USED FOR LINE(S)	1542
LINE	1134	USED FOR LINE(S)	1548
LINE	1135	USED FOR LINE(S)	1550
LINE	1142	USED FOR LINE(S)	1556
LINE	1143	USED FOR LINE(S)	1558
LINE	1150	USED FOR LINE(S)	1564
LINE	1151	USED FOR LINE(S)	1566
LINE	1158	USED FOR LINE(S)	1572
LINE	1159	USED FOR LINE(S)	1574
LINE	1165	USED FOR LINE(S)	1578
LINE	1167	USED FOR LINE(S)	1579
LINE	1168	USED FOR LINE(S)	1588
LINE	1169	USED FOR LINE(S)	1590
LINE	1174	USED FOR LINE(S)	1594
LINE	1175	USED FOR LINE(S)	1596
LINE	1183	USED FOR LINE(S)	1597
LINE	1185	USED FOR LINE(S)	1598
LINE	1186	USED FOR LINE(S)	1605
LINE	1187	USED FOR LINE(S)	1607
LINE	1191	USED FOR LINE(S)	1610
LINE	1192	USED FOR LINE(S)	1612
LINE	1199	USED FOR LINE(S)	1613
LINE	1201	USED FOR LINE(S)	1614
LINE	1202	USED FOR LINE(S)	1621
LINE	1203	USED FOR LINE(S)	1623
LINE	1207	USED FOR LINE(S)	1626
LINE	1208	USED FOR LINE(S)	1628
LINE	1216	USED FOR LINE(S)	1629
LINE	1218	USED FOR LINE(S)	1630
LINE	1219	USED FOR LINE(S)	1639
LINE	1220	USED FOR LINE(S)	1641
LINE	1225	USED FOR LINE(S)	1645
LINE	1226	USED FOR LINE(S)	1647
LINE	1234	USED FOR LINE(S)	1648
LINE	1236	USED FOR LINE(S)	1649
LINE	1237	USED FOR LINE(S)	1656
LINE	1238	USED FOR LINE(S)	1658
LINE	1242	USED FOR LINE(S)	1661
LINE	1243	USED FOR LINE(S)	1663
LINE	1250	USED FOR LINE(S)	1664
LINE	1252	USED FOR LINE(S)	1665
LINE	1253	USED FOR LINE(S)	1672
LINE	1254	USED FOR LINE(S)	1674
LINE	1258	USED FOR LINE(S)	1677
LINE	1259	USED FOR LINE(S)	1679
LINE	1266	USED FOR LINE(S)	1680
LINE	1268	USED FOR LINE(S)	1681
LINE	1269	USED FOR LINE(S)	1688
LINE	1270	USED FOR LINE(S)	1690
LINE	1274	USED FOR LINE(S)	1693
LINE	1275	USED FOR LINE(S)	1695
AREA	89	USED FOR AREA(S)	1148
AREA	102	USED FOR AREA(S)	423
AREA	105	USED FOR AREA(S)	1161
AREA	118	USED FOR AREA(S)	439
AREA	124	USED FOR AREA(S)	1168
AREA	127	USED FOR AREA(S)	453
AREA	133	USED FOR AREA(S)	1176
AREA	136	USED FOR AREA(S)	462
AREA	142	USED FOR AREA(S)	1184
AREA	145	USED FOR AREA(S)	469
AREA	151	USED FOR AREA(S)	1192
AREA	154	USED FOR AREA(S)	478
AREA	169	USED FOR AREA(S)	1347
AREA	178	USED FOR AREA(S)	633
AREA	185	USED FOR AREA(S)	640
AREA	194	USED FOR AREA(S)	1350
AREA	201	USED FOR AREA(S)	645

AREA	210	USED FOR AREA(S)	1355
AREA	217	USED FOR AREA(S)	1277
AREA	219	USED FOR AREA(S)	1362
AREA	228	USED FOR AREA(S)	648
AREA	230	USED FOR AREA(S)	555
AREA	233	USED FOR AREA(S)	1289
AREA	235	USED FOR AREA(S)	654
AREA	244	USED FOR AREA(S)	1364
AREA	246	USED FOR AREA(S)	567
AREA	249	USED FOR AREA(S)	1301
AREA	251	USED FOR AREA(S)	658
AREA	260	USED FOR AREA(S)	1368
AREA	262	USED FOR AREA(S)	579
AREA	265	USED FOR AREA(S)	1374
AREA	268	USED FOR AREA(S)	1307
AREA	271	USED FOR AREA(S)	593
AREA	274	USED FOR AREA(S)	660
AREA	277	USED FOR AREA(S)	1314
AREA	280	USED FOR AREA(S)	600
AREA	283	USED FOR AREA(S)	666
AREA	286	USED FOR AREA(S)	1321
AREA	289	USED FOR AREA(S)	607
AREA	292	USED FOR AREA(S)	1376
AREA	295	USED FOR AREA(S)	1328
AREA	298	USED FOR AREA(S)	614
AREA	301	USED FOR AREA(S)	670
AREA	304	USED FOR AREA(S)	1335
AREA	307	USED FOR AREA(S)	621
AREA	310	USED FOR AREA(S)	1380
AREA	313	USED FOR AREA(S)	1342
AREA	316	USED FOR AREA(S)	628
AREA	319	USED FOR AREA(S)	1386
AREA	321	USED FOR AREA(S)	672
AREA	323	USED FOR AREA(S)	679
AREA	325	USED FOR AREA(S)	1389
AREA	327	USED FOR AREA(S)	684
AREA	329	USED FOR AREA(S)	1394
AREA	331	USED FOR AREA(S)	1401
AREA	333	USED FOR AREA(S)	687
AREA	335	USED FOR AREA(S)	693
AREA	337	USED FOR AREA(S)	1403
AREA	339	USED FOR AREA(S)	697
AREA	341	USED FOR AREA(S)	1407
AREA	343	USED FOR AREA(S)	1413
AREA	345	USED FOR AREA(S)	699
AREA	347	USED FOR AREA(S)	705
AREA	349	USED FOR AREA(S)	1415
AREA	351	USED FOR AREA(S)	709
AREA	353	USED FOR AREA(S)	1419
AREA	355	USED FOR AREA(S)	1425
AREA	357	USED FOR AREA(S)	711
AREA	359	USED FOR AREA(S)	717
AREA	361	USED FOR AREA(S)	1427
AREA	363	USED FOR AREA(S)	721
AREA	365	USED FOR AREA(S)	1431
AREA	436	USED FOR AREA(S)	779
AREA	449	USED FOR AREA(S)	795
AREA	456	USED FOR AREA(S)	809
AREA	464	USED FOR AREA(S)	818
AREA	472	USED FOR AREA(S)	825
AREA	480	USED FOR AREA(S)	834
AREA	565	USED FOR AREA(S)	911
AREA	577	USED FOR AREA(S)	923
AREA	589	USED FOR AREA(S)	935
AREA	595	USED FOR AREA(S)	949
AREA	602	USED FOR AREA(S)	956
AREA	609	USED FOR AREA(S)	963
AREA	616	USED FOR AREA(S)	970
AREA	623	USED FOR AREA(S)	977
AREA	630	USED FOR AREA(S)	984

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AREA 635 USED FOR AREA(S) 989
AREA 638 USED FOR AREA(S) 996
AREA 643 USED FOR AREA(S) 1001
AREA 650 USED FOR AREA(S) 1004
AREA 652 USED FOR AREA(S) 1010
AREA 656 USED FOR AREA(S) 1014
AREA 662 USED FOR AREA(S) 1016
AREA 664 USED FOR AREA(S) 1022
AREA 668 USED FOR AREA(S) 1026
AREA 674 USED FOR AREA(S) 1028
AREA 677 USED FOR AREA(S) 1035
AREA 682 USED FOR AREA(S) 1040
AREA 689 USED FOR AREA(S) 1043
AREA 691 USED FOR AREA(S) 1049
AREA 695 USED FOR AREA(S) 1053
AREA 701 USED FOR AREA(S) 1055
AREA 703 USED FOR AREA(S) 1061
AREA 707 USED FOR AREA(S) 1065
AREA 713 USED FOR AREA(S) 1067
AREA 715 USED FOR AREA(S) 1073
AREA 719 USED FOR AREA(S) 1077
AREA 792 USED FOR AREA(S) 1135
AREA 805 USED FOR AREA(S) 1151
AREA 812 USED FOR AREA(S) 1165
AREA 820 USED FOR AREA(S) 1174
AREA 828 USED FOR AREA(S) 1181
AREA 836 USED FOR AREA(S) 1190
AREA 921 USED FOR AREA(S) 1267
AREA 933 USED FOR AREA(S) 1279
AREA 945 USED FOR AREA(S) 1291
AREA 951 USED FOR AREA(S) 1305
AREA 958 USED FOR AREA(S) 1312
AREA 965 USED FOR AREA(S) 1319
AREA 972 USED FOR AREA(S) 1326
AREA 979 USED FOR AREA(S) 1333
AREA 986 USED FOR AREA(S) 1340
AREA 991 USED FOR AREA(S) 1345
AREA 994 USED FOR AREA(S) 1352
AREA 999 USED FOR AREA(S) 1357
AREA 1006 USED FOR AREA(S) 1360
AREA 1008 USED FOR AREA(S) 1366
AREA 1012 USED FOR AREA(S) 1370
AREA 1018 USED FOR AREA(S) 1372
AREA 1020 USED FOR AREA(S) 1378
AREA 1024 USED FOR AREA(S) 1382
AREA 1030 USED FOR AREA(S) 1384
AREA 1033 USED FOR AREA(S) 1391
AREA 1038 USED FOR AREA(S) 1396
AREA 1045 USED FOR AREA(S) 1399
AREA 1047 USED FOR AREA(S) 1405
AREA 1051 USED FOR AREA(S) 1409
AREA 1057 USED FOR AREA(S) 1411
AREA 1059 USED FOR AREA(S) 1417
AREA 1063 USED FOR AREA(S) 1421
AREA 1069 USED FOR AREA(S) 1423
AREA 1071 USED FOR AREA(S) 1429
AREA 1075 USED FOR AREA(S) 1433

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Define Some LOCAL Coordinate Systems for use
 IF THE CSYS,15, WAS USED... THESE MUST BE REDEFINED TO THE
 POUR CANISTER CENTER LINES.... I.E. THE X-Y's ARE ON AXIS

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COORDINATE SYSTEM 21 DEFINITION. TYPE= 0 (CARTESIAN)
XC,YC,ZC= .32495 .32495 .00000E+00
ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

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ACTIVE COORDINATE SYSTEM SET TO 21 (CARTESIAN)

COORDINATE SYSTEM 22 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= .32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 22 (CARTESIAN)

COORDINATE SYSTEM 23 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= -.32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 23 (CARTESIAN)

COORDINATE SYSTEM 24 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= -.32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 24 (CARTESIAN)

COORDINATE SYSTEM 31 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

COORDINATE SYSTEM 32 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

COORDINATE SYSTEM 33 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= -.32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

COORDINATE SYSTEM 34 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= -.32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #1 - ASSUME NO RAD. DONT DO

TYPE,6,
 VSEL,S,MAT,,5,
 ASEL,S,EXT,
 CSYS,31,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
 NSLA,S,1,
 ESURF,

Inner SS. Lid of Can. #1

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 CSYS,31,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,

CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
NSLA,S,1,
ESURF,

Inner SS. Side of Can. #1

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
CSYS,31,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0
CSYS,0,
NSLA,S,1,
ESURF,

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #2

TYPE,6,
VSEL,S,MAT,,5,
ASEL,S,EXT,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
NSLA,S,1,
ESURF,

Inner SS. Lid of Can. #2

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
NSLA,S,1,
ESURF,

Inner SS. Side of Can. #2

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0
CSYS,0,
NSLA,S,1,
ESURF,

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #3

TYPE,6,
VSEL,S,MAT,,5,
ASEL,S,EXT,
CSYS,33,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
NSLA,S,1,
ESURF,

Inner SS. Lid of Can. #3

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
CSYS,33,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),

ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
 NSLA,S,1,
 ESURF,

Inner SS. Side of Can. #3

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
 ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
 CSYS,33,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0
 CSYS,0,
 NSLA,S,1,
 ESURF,

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #4

TYPE,6,
 VSEL,S,MAT,,5,
 ASEL,S,EXT,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
 NSLA,S,1,
 ESURF,

Inner SS. Lid of Can. #4

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
 ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
 NSLA,S,1,
 ESURF,

Inner SS. Side of Can. #4

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
 ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
 NSLA,S,1,
 ESURF,

Define Elements for radiation - Between Can and IB

Pour Can. Surf.

Top Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
 KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2345 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5099
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=

IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Top Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Sides Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00

KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

*** NOTE *** CP= 76.210 TIME= 10:46:13
Page file used.

NUMBER OF ELEMENTS GENERATED= 64

Top Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Top Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Inner Barrier Inside Surfaces

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 2 TO 2 STEP 1

64 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

152 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.5060 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5360

KABS= 0. TOLERANCE= .000000E+00

128 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .78550 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

80 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

962 NODES (OF 8979 DEFINED) SELECTED FROM
80 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 832

Define Elements for radiation

In Inner Barrier / Out Barrier Gap - ASSUME NO RAD. SO DONT DEFINE
Top of Inner Barrier Lid

TYPE,16,
VSEL,S,MAT,,2,
ASEL,S,EXT,
ASEL,R,LOC,Z,(TPPT2-0.001),(TPPT2+0.001),
NSLA,S,1,
ESURF,

Bottom of Outer Barrier Lid

TYPE,16,
ASEL,S,LOC,Z,(TPPT1-0.001),(TPPT1+0.001),
ASEL,U,AREA,,346,
ASEL,U,AREA,,702,
ASEL,U,AREA,,1058,
ASEL,U,AREA,,1414,
NSLA,S,1,
ESURF,

Side of Outer Barrier WP (Inside Surface)

TYPE,16,
VSEL,S,MAT,,15,
ASEL,S,EXT,
CSYS,11,
ASEL,U,LOC,X,(DCORD-IWALL),100,
CSYS,0,
ASEL,U,LOC,Z,-100,TPPT2,
ASEL,U,LOC,Z,TPPT1,100,
NSLA,S,1,
ESURF,

Define Elements for radiation

Outer Surface of Waste Package

ELEMENT TYPE SET TO 36
Bottom Lid

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.6160 AND -1.6140

KABS= 0. TOLERANCE= .000000E+00

12 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

337 NODES (OF 8979 DEFINED) SELECTED FROM
12 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320
Side of WP

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN -.85350 AND .85350
KABS= 0. TOLERANCE= .000000E+00

68 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

800 NODES (OF 8979 DEFINED) SELECTED FROM
68 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 768
Top Lid

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.6140 AND 1.6160
KABS= 0. TOLERANCE= .000000E+00

12 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

337 NODES (OF 8979 DEFINED) SELECTED FROM
12 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320

***** ROUTINE COMPLETED ***** CP = 97.160

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= glsp21x2.db
FOR POSSIBLE RESUME FROM THIS POINT

Generate super-elements

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:46:46 OCT 28, 1995 CP= 107.310
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RADIATION MATRIX UTILITY (AUX12) *****

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 26 TO 26 STEP 1

1920 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

1930 NODES (OF 8979 DEFINED) SELECTED FROM
1920 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= .56700E-07

THREE DIMENSIONAL GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 100

WRITE RADIATION MATRIX TO FILE= ibrcanga.sub

*** WARNING *** CP= 107.740 TIME= 10:46:46
No space node defined. An enclosed system need not have a space node.
For an open system a space node is required to account for radiation losses.

NUMBER OF ELEMENTS= 1920 NUMBER OF NODES= 1930
DEFINE 100 RADIAL ZONES, 20200 RAYS
DEFINE THE 20200 RAY POINTS
SORT THE 20200 RAY POINTS

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10656 STEP 1

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 5876.930

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 12:23:03 OCT 28, 1995 CP= 5876.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RADIATION MATRIX UTILITY (AUX12) *****

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 36 TO 36 STEP 1

1408 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 46 TO 46 STEP 1

1728 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

1750 NODES (OF 8979 DEFINED) SELECTED FROM
1728 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= .56700E-07

THREE DIMENSIONAL GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 100

WRITE RADIATION MATRIX TO FILE= obrdrwga.sub

*** WARNING *** CP= 5877.550 TIME= 12:23:03
No space node defined. An enclosed system need not have a space node.
For an open system a space node is required to account for radiation losses.

NUMBER OF ELEMENTS= 1728 NUMBER OF NODES= 1750
DEFINE 100 RADIAL ZONES, 20200 RAYS
DEFINE THE 20200 RAY POINTS
SORT THE 20200 RAY POINTS

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10656 STEP 1

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

.8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 7856.950

- DO NOT DO RADITATION FOR INTERNAL P. CAN OR THE I/O B. GAP
/AUX12,
ESEL,S,TYPE,,16,
NSLE,S,
STEF,5.67E-8,
GEOM,0,
VTYPE,0,100,
WRITE,iobargap,
ESEL,ALL,
NSEL,ALL,
FINISH


```
/COM,  
/AUX12,  
ESEL,S,TYPE,,6,  
NSLE,S,  
STEF,5.67E-8,  
GEOM,0,  
VTYPE,0,100,  
WRITE,glscangap,
```

```
ALL SELECT FOR ITEM=ELEM COMPONENT=  
IN RANGE 1 TO 10656 STEP 1
```

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

```
ALL SELECT FOR ITEM=NODE COMPONENT=  
IN RANGE 1 TO 10009 STEP 1
```

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 12:56:06 OCT 28, 1995 CP= 7857.040
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

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

```
ELEMENT TYPE SET TO 18  
SE,glscangap,  
SE,iobargap,
```

SUPERELEMENT 10657 ibrcanga NODE TOLERANCE = .10000E-03

STORE DOFS OF SUPERELEMENT 10657

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

STORE NODES OF SUPERELEMENT 10657

SUPERELEMENT 10658 obrdrwga NODE TOLERANCE = .10000E-03

STORE DOFS OF SUPERELEMENT 10658

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

STORE NODES OF SUPERELEMENT 10658
Delete radiation edge elements

```
SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 6 TO 6 STEP 1
```

0 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 16 TO 16 STEP 1
```

0 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 26 TO 26 STEP 1
```

1920 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 36 TO 36 STEP 1
```

3328 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 46 TO 46 STEP 1

3648 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

DELETE ALL SELECTED ELEMENTS.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 1695 STEP 1

1359 LINES (OF 1359 DEFINED) SELECTED BY LSEL COMMAND.

Define SHELL Element thicknesses; Required for solution:

REAL CONSTANT SET 1 ITEMS 1 TO 6
.10000E-02 .10000E-02 .10000E-02 .10000E-02 .00000E+00 .00000E+00

***** ROUTINE COMPLETED ***** CP = 7859.790

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= glsp21x2.db
FOR POSSIBLE RESUME FROM THIS POINT

Gaps in WP between glass, can, Inner Barrier and Outer Barrier.....
DONT MESH; Either Assume its VOID or its meshed earlier
This section used only if both rad. and He conducti
is used in the model.
He/Air in WP I/O Bar. Gap

/PREP7
ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 96, 97,1
VMESH,197,198,1
VMESH,298,299,1
VMESH,399,400,1

Now Mesh inside of WP; DONT MESH Assume VOID
He space in WP

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 17, 24,1
VMESH,118,125,1
VMESH,219,226,1
VMESH,320,327,1

VMESH, 57, 68,1
VMESH,158,169,1
VMESH,259,270,1
VMESH,360,371,1

VMESH, 81,
VMESH,182,
VMESH,283,
VMESH,384,

VMESH, 90,
VMESH,191,

VMESH,292,
VMESH,393,

Now Mesh inside of Can DONT MESH Assume VOID
He/Air in Pour Can.

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 37, 40,1
VMESH,138,141,1
VMESH,239,242,1
VMESH,340,343,1

NUMMRG,ELEM,
NUMMRG,NODE,
NUMMRG,KP,
FINISH

Create element mesh plots to illustrate model

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 12:56:22 OCT 28, 1995 CP= 7869.280
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RESULTS INTERPRETATION (POST1) *****
View model meshing from drift end view

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 .00000E+00 .00000E+00 1.0000

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

164 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3072 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
164 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

5 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3232 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
5 SELECTED AREAS BY ESLA COMMAND.

TITLE=

DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshfct.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshfct.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH
View model meshing for 45 side cut-away

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 1.0000 1.0000

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 135.00
KABS= 0. TOLERANCE= .000000E+00

18 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

240 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
18 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 45.000
KABS= 0. TOLERANCE= .000000E+00

27 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

600 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
27 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3800 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3992 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

TITLE=
DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshcut.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshcut.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH
View model meshing for 90 side cut-away

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 .000000E+00 .000000E+00

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3200 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3392 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

TITLE=
DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshsct.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshsct.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED ***** CP = 7879.030

Set solution parameters and apply B.C.'s

Solve steady-state for initial conditions
with WP surface equal to drift ambient
temperature from repository model.

***** ANSYS SOLUTION ROUTINE *****

PERFORM A TRANSIENT ANALYSIS
THIS WILL BE A NEW ANALYSIS

USE THE DEFAULT NEWTON-RAPHSON OPTION FOR ALL DOFS
AND USE THE DEFAULT ADAPTIVE DESCENT OPTION

*** NOTE *** CP= 7879.040 TIME= 12:56:32
Damping (if present) may be ignored only in reduced transient analyses.

PERFORM A FULL TRANSIENT ANALYSIS

TEMPERATURE OFFSET FROM ABSOLUTE ZERO= 273.150
Apply Drift Wall Temp. BC

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1379438 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=

IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.
Apply Heat Generation BC to glass

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1444.80589 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.
Set Solution Params and solve

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= .10000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE COMMAND *****

*** NOTE *** CP= 7881.390 TIME= 12:56:34
All shape tests were bypassed for elements associated with the solid
model, because most of them were already done at AMESH or VMESH. Use
CHECK if desired to perform all of the element tests.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 12:56:34 OCT 28, 1995 CP= 7881.390
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

SOLUTION OPTIONS

PROBLEM DIMENSIONALITY. 3-D
DEGREES OF FREEDOM. TEMP
ANALYSIS TYPE. TRANSIENT
SOLUTION METHOD. FULL
OFFSET TEMPERATURE FROM ABSOLUTE ZERO. 273.15
NEWTON-RAPHSON OPTION. PROGRAM CHOSEN

*** NOTE *** CP= 7882.830 TIME= 12:56:36
This load step will be a static (steady-state) step.

*** NOTE *** CP= 7883.270 TIME= 12:56:36
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

LOAD STEP OPTIONS

LOAD STEP NUMBER. 1
TIME AT END OF THE LOAD STEP. 10000E-05
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

TOTAL MASS = 19821.

CENTROID	MOM. OF INERTIA ABOUT ORIGIN	MOM. OF INERTIA ABOUT CENTROID
XC = -.47040E-12	IXX = .2730E+05	IXX = .2701E+05
YC = -.10514E-01	IYY = .2709E+05	IYY = .2680E+05
ZC = -.12014	IZZ = 9810.	IZZ = 9808.
	IXY = .8715E-08	IXY = .8813E-08
	IYZ = .4597E-10	IYZ = 25.04
	IZX = -.2955E-08	IZX = -.1835E-08

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
2	19692.2
11	129.199

Range of element maximum matrix coefficients in global coordinates
Maximum= 11.1632414 at element 4464.
Minimum= 4.837293208E-09 at element 10657.

*** WARNING *** CP= 7921.970 TIME= 12:58:10
Coefficient ratio exceeds 1.0e8 - Check results.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	22.280	.003
11	320	SHELL57	.810	.003
18	2	MATRIX50	5.510	2.755

Time at end of element matrix formulation CP= 7921.97.
HT FLOW CONVERGENCE VALUE= 154.0 CRITERION= .1540

Estimated number of active DOF= 8639.

Maximum wavefront= 2002.

Time at end of matrix triangularization CP= 8996.94.
 Equation solver maximum pivot= 45.7732646 at node 8097 TEMP.
 Equation solver minimum pivot= 0.217830495 at node 3498 TEMP.
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 191.4
 HT FLOW CONVERGENCE VALUE= 444.3 CRITERION= .9758E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -51.15
 HT FLOW CONVERGENCE VALUE= 52.83 CRITERION= .9758E-01
 EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -12.72
 HT FLOW CONVERGENCE VALUE= 9.754 CRITERION= .9758E-01
 EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.9473
 HT FLOW CONVERGENCE VALUE= .6400 CRITERION= .9758E-01
 EQUIL ITER 5 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1997
 HT FLOW CONVERGENCE VALUE= .1575 CRITERION= .9758E-01
 EQUIL ITER 6 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1489E-01
 HT FLOW CONVERGENCE VALUE= .9058E-02 CRITERION= .9758E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 6

*** ELEMENT RESULT CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	14.420	.002
11	320	SHELL57	.420	.001
18	2	MATRIX50	8.810	4.405

*** NODAL LOAD CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	1.050	.000
11	320	SHELL57	.060	.000
18	2	MATRIX50	.000	.000

*** LOAD STEP 1 SUBSTEP 1 COMPLETED. CUM ITER = 6
 *** TIME = .100000E-05 TIME INC = .100000E-05

*** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM = 8639
 R.M.S. WAVEFRONT SIZE = 964.8

*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED= 4096
 57.625 MB WRITTEN ON ELEMENT MATRIX FILE: glsp21x2.emat
 5.953 MB WRITTEN ON ELEMENT SAVED DATA FILE: glsp21x2.esav
 58.766 MB WRITTEN ON TRIANGULARIZED MATRIX FILE: glsp21x2.tri
 .047 MB WRITTEN ON SUBSTRUCTURE DOF SOLUTION FILE: glsp21x2.dsub
 5.297 MB WRITTEN ON RESULTS FILE: glsp21x2.rth

Solve steady-state for initial conditions
 with WP surface temperatures from repository
 steady-state solution.
 Apply Drift Wall Temp. BC

SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
 KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
 10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
 RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1383000 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.
Apply Heat Generation BC to glass

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1444.80589 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.
Set Solution Params and solve

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= .20000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 14580.020 TIME= 15:08:39
This load step will be a static (steady-state) step.

*** NOTE *** CP= 14580.460 TIME= 15:08:40
The step data was checked and warning messages were found.
Please review output or errors file (glsp21x2.err) for these warning messages.

*** NOTE *** CP= 14580.460 TIME= 15:08:40
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 15:08:40 OCT 28, 1995 CP= 14580.460
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 2
TIME AT END OF THE LOAD STEP. 20000E-05
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= .9344E-02 CRITERION= .9758E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2685E-02
HT FLOW CONVERGENCE VALUE= .2027E-02 CRITERION= .9758E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 2 SUBSTEP 1 COMPLETED. CUM ITER = 7
*** TIME = .20000E-05 TIME INC = .10000E-05

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= glsp21x2.db
FOR POSSIBLE RESUME FROM THIS POINT

SOLVE A SET OF STEADY STATE POINTS FOR GRINS AND GIGGLES

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

USE AUTOMATIC TIME STEPPING THIS LOAD STEP
Time substep ranges from 10 sec to 1/4 loadstep
NSUBST,10,20,5,ON
Begin Transient
Apply loads and solve for 0 to .9 years

*DO LOOP ON PARAMETER= TM FROM 31.558 TO .28402E+08 BY .31558E+07

TIME= 31.558

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1444.80589 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1383000 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 14870.600 TIME= 15:19:10
This load step will be a static (steady-state) step.

*** NOTE *** CP= 14871.040 TIME= 15:19:10
The step data was checked and warning messages were found.
Please review output or errors file (glsp21x2.err) for these warning messages.

*** NOTE *** CP= 14871.040 TIME= 15:19:10
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 15:19:10 OCT 28, 1995 CP= 14871.050
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 3
TIME AT END OF THE LOAD STEP. 31.558
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= .2027E-02 CRITERION= .9758E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2610E-03
HT FLOW CONVERGENCE VALUE= .1558E-03 CRITERION= .9758E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 3 SUBSTEP 1 COMPLETED. CUM ITER = 8
*** TIME = 31.5576 TIME INC = 31.5576

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 15145.130 TIME= 15:29:14
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 15:29:14 OCT 28, 1995 CP= 15145.570
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 139.3 CRITERION= .1700
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 20.28
HT FLOW CONVERGENCE VALUE= 24.47 CRITERION= .9742E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -4.405
HT FLOW CONVERGENCE VALUE= 3.179 CRITERION= .9742E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2641
HT FLOW CONVERGENCE VALUE= .1604 CRITERION= .9742E-01
EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .4669E-01
HT FLOW CONVERGENCE VALUE= .3493E-01 CRITERION= .9742E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 4
*** LOAD STEP 4 SUBSTEP 1 COMPLETED. CUM ITER = 12
*** TIME = .315579E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 15979.810 TIME= 15:58:02
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 15:58:03 OCT 28, 1995 CP= 15980.250
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 72.09 CRITERION= .1211
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 8.872
HT FLOW CONVERGENCE VALUE= 10.53 CRITERION= .9725E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.855
HT FLOW CONVERGENCE VALUE= 1.324 CRITERION= .9725E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.9959E-01
HT FLOW CONVERGENCE VALUE= .6039E-01 CRITERION= .9725E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 5 SUBSTEP 1 COMPLETED. CUM ITER = 15
*** TIME = .631155E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 16622.560 TIME= 16:20:32
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 16:20:32 OCT 28, 1995 CP= 16623.000
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 52.94 CRITERION= .1106
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 6.064
HT FLOW CONVERGENCE VALUE= 7.116 CRITERION= .9709E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.227
HT FLOW CONVERGENCE VALUE= .8609 CRITERION= .9709E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.6220E-01
HT FLOW CONVERGENCE VALUE= .3713E-01 CRITERION= .9709E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 6 SUBSTEP 1 COMPLETED. CUM ITER = 18
*** TIME = .946731E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 17268.610 TIME= 16:43:20
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 16:43:21 OCT 28, 1995 CP= 17269.100
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 43.09 CRITERION= .1061
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 4.702
HT FLOW CONVERGENCE VALUE= 5.459 CRITERION= .9693E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.9252
HT FLOW CONVERGENCE VALUE= .6400 CRITERION= .9693E-01

EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4498E-01
HT FLOW CONVERGENCE VALUE= .2649E-01 CRITERION= .9693E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 7 SUBSTEP 1 COMPLETED. CUM ITER = 21
*** TIME = .126231E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 17931.490 TIME= 17:09:48
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7(X) 17:09:48 OCT 28, 1995 CP= 17931.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 36.76 CRITERION= .1035
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.864
HT FLOW CONVERGENCE VALUE= 4.444 CRITERION= .9677E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.7429
HT FLOW CONVERGENCE VALUE= .5069 CRITERION= .9677E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3463E-01
HT FLOW CONVERGENCE VALUE= .2032E-01 CRITERION= .9677E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 8 SUBSTEP 1 COMPLETED. CUM ITER = 24
*** TIME = .157788E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 18574.460 TIME= 17:32:14
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 17:32:15 OCT 28, 1995 CP= 18574.910
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 32.29 CRITERION= .1019
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.293
HT FLOW CONVERGENCE VALUE= 3.663 CRITERION= .9660E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.6207
HT FLOW CONVERGENCE VALUE= .3896 CRITERION= .9660E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2804E-01
HT FLOW CONVERGENCE VALUE= .1759E-01 CRITERION= .9660E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 9 SUBSTEP 1 COMPLETED. CUM ITER = 27
*** TIME = .189346E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 19217.340 TIME= 17:54:43
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 17:54:43 OCT 28, 1995 CP= 19217.780
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 29.00 CRITERION= .1007
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.882
HT FLOW CONVERGENCE VALUE= 3.082 CRITERION= .9644E-01

EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5337
HT FLOW CONVERGENCE VALUE= .3237 CRITERION= .9644E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2328E-01
HT FLOW CONVERGENCE VALUE= .1497E-01 CRITERION= .9644E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 10 SUBSTEP 1 COMPLETED. CUM ITER = 30
*** TIME = .220904E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 19862.080 TIME= 18:17:12
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 18:17:12 OCT 28, 1995 CP= 19862.520
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 26.18 CRITERION= .9978E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.545
HT FLOW CONVERGENCE VALUE= 2.679 CRITERION= .9628E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4636
HT FLOW CONVERGENCE VALUE= .2769 CRITERION= .9628E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1935E-01
HT FLOW CONVERGENCE VALUE= .1268E-01 CRITERION= .9628E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 11 SUBSTEP 1 COMPLETED. CUM ITER = 33
*** TIME = .252461E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 20511.940 TIME= 18:39:47
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 18:39:47 OCT 28, 1995 CP= 20512.380
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 24.02 CRITERION= .9907E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.289
HT FLOW CONVERGENCE VALUE= 2.285 CRITERION= .9612E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4110
HT FLOW CONVERGENCE VALUE= .2438 CRITERION= .9612E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1660E-01
HT FLOW CONVERGENCE VALUE= .1097E-01 CRITERION= .9612E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 12 SUBSTEP 1 COMPLETED. CUM ITER = 36
*** TIME = .284019E+08 TIME INC = .315576E+07
NSUBST,10,25,10,ON

Apply loads and solve for 1 to 9 years

*DO LOOP ON PARAMETER= TM FROM .31558E+08 TO .28402E+09 BY .31558E+08
TIME= .31558E+08

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM

32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1420.78590 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 83.0314775 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 21162.350 TIME= 19:02:22
This load step will be a static (steady-state) step.

*** NOTE *** CP= 21162.790 TIME= 19:02:23
The step data was checked and warning messages were found.
Please review output or errors file (glsp21x2.err) for these warning messages.

*** NOTE *** CP= 21162.790 TIME= 19:02:23
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 19:02:23 OCT 28, 1995 CP= 21162.790
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 13
TIME AT END OF THE LOAD STEP. 31558E+08
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 22.42 CRITERION= .9854E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.099
HT FLOW CONVERGENCE VALUE= 1.869 CRITERION= .9596E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3726
HT FLOW CONVERGENCE VALUE= .2212 CRITERION= .9596E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1460E-01
HT FLOW CONVERGENCE VALUE= .9951E-02 CRITERION= .9596E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 13 SUBSTEP 1 COMPLETED. CUM ITER = 39
*** TIME = .315576E+08 TIME INC = .315576E+07

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 21814.060 TIME= 19:24:59
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 19:25:00 OCT 28, 1995 CP= 21814.500
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 160.5 CRITERION= .1862
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 14.79
HT FLOW CONVERGENCE VALUE= 11.28 CRITERION= .9437E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.326
HT FLOW CONVERGENCE VALUE= 1.281 CRITERION= .9437E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.8336E-01
HT FLOW CONVERGENCE VALUE= .5065E-01 CRITERION= .9437E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 14 SUBSTEP 1 COMPLETED. CUM ITER = 42

*** TIME = .631152E+08 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 22460.260 TIME= 19:47:32
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 19:47:32 OCT 28, 1995 CP= 22460.710
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 114.1 CRITERION= .1471
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 9.406
HT FLOW CONVERGENCE VALUE= 6.748 CRITERION= .9282E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.383
HT FLOW CONVERGENCE VALUE= .6896 CRITERION= .9282E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4428E-01
HT FLOW CONVERGENCE VALUE= .2759E-01 CRITERION= .9282E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 15 SUBSTEP 1 COMPLETED. CUM ITER = 45
*** TIME = .946728E+08 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 23113.720 TIME= 20:10:09
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 20:10:10 OCT 28, 1995 CP= 23114.170
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 95.77 CRITERION= .1323
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 7.372
HT FLOW CONVERGENCE VALUE= 4.867 CRITERION= .9131E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.024
HT FLOW CONVERGENCE VALUE= .4893 CRITERION= .9131E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3030E-01
HT FLOW CONVERGENCE VALUE= .1841E-01 CRITERION= .9131E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 16 SUBSTEP 1 COMPLETED. CUM ITER = 48
*** TIME = .126230E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 23760.910 TIME= 20:32:41
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 20:32:42 OCT 28, 1995 CP= 23761.350
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 86.74 CRITERION= .1249
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 6.331
HT FLOW CONVERGENCE VALUE= 4.080 CRITERION= .8983E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.8355
HT FLOW CONVERGENCE VALUE= .3849 CRITERION= .8983E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .2337E-01
HT FLOW CONVERGENCE VALUE= .1360E-01 CRITERION= .8983E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 17 SUBSTEP 1 COMPLETED. CUM ITER = 51
*** TIME = .157788E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 24413.680 TIME= 20:55:20
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 20:55:20 OCT 28, 1995 CP= 24414.120
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 76.15 CRITERION= .1167
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 5.314
HT FLOW CONVERGENCE VALUE= 3.358 CRITERION= .8838E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.6707
HT FLOW CONVERGENCE VALUE= .2995 CRITERION= .8838E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1847E-01
HT FLOW CONVERGENCE VALUE= .1005E-01 CRITERION= .8838E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 18 SUBSTEP 1 COMPLETED. CUM ITER = 54
*** TIME = .189346E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 25067.080 TIME= 21:17:57
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 21:17:57 OCT 28, 1995 CP= 25067.520
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 65.40 CRITERION= .1088
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 4.397
HT FLOW CONVERGENCE VALUE= 2.705 CRITERION= .8697E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5334
HT FLOW CONVERGENCE VALUE= .2317 CRITERION= .8697E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1453E-01
HT FLOW CONVERGENCE VALUE= .7449E-02 CRITERION= .8697E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 19 SUBSTEP 1 COMPLETED. CUM ITER = 57
*** TIME = .220903E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 25720.340 TIME= 21:40:35
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 21:40:35 OCT 28, 1995 CP= 25720.790
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 59.79 CRITERION= .1044
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.899
HT FLOW CONVERGENCE VALUE= 2.336 CRITERION= .8559E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4561
HT FLOW CONVERGENCE VALUE= .1930 CRITERION= .8559E-01

EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1221E-01
HT FLOW CONVERGENCE VALUE= .5954E-02 CRITERION= .8559E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 20 SUBSTEP 1 COMPLETED. CUM ITER = 60
*** TIME = .252461E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 26367.660 TIME= 22:03:07
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:03:07 OCT 28, 1995 CP= 26368.100
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 46.72 CRITERION= .9632E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.965
HT FLOW CONVERGENCE VALUE= 1.719 CRITERION= .8424E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3347
HT FLOW CONVERGENCE VALUE= .1392 CRITERION= .8424E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .9112E-02
HT FLOW CONVERGENCE VALUE= .4190E-02 CRITERION= .8424E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 21 SUBSTEP 1 COMPLETED. CUM ITER = 63
*** TIME = .284018E+09 TIME INC = .315576E+08
NSUBST,17,40,15,ON

Apply loads and solve for 10 to 90 years

*DO LOOP ON PARAMETER= TM FROM .31558E+09 TO .28402E+10 BY .31558E+09

TIME= .31558E+09

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1227.66065 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 139.973714 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 27021.670 TIME= 22:25:46
This load step will be a static (steady-state) step.

*** NOTE *** CP= 27022.120 TIME= 22:25:47
The step data was checked and warning messages were found.
Please review output or errors file (glsp21x2.err) for these warning
messages.

*** NOTE *** CP= 27022.120 TIME= 22:25:47
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:25:47 OCT 28, 1995 CP= 27022.120
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 22
TIME AT END OF THE LOAD STEP. 31558E+09
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25

STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 39.74 CRITERION= .9194E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.472
HT FLOW CONVERGENCE VALUE= 1.393 CRITERION= .8292E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2702
HT FLOW CONVERGENCE VALUE= .1104 CRITERION= .8292E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7359E-02
HT FLOW CONVERGENCE VALUE= .3239E-02 CRITERION= .8292E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 22 SUBSTEP 1 COMPLETED. CUM ITER = 66
*** TIME = .315576E+09 TIME INC = .315576E+08

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 27668.560 TIME= 22:48:18
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:48:19 OCT 28, 1995 CP= 27669.010
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 291.1 CRITERION= .2994
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 17.80
HT FLOW CONVERGENCE VALUE= 6.326 CRITERION= .7125E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.373
HT FLOW CONVERGENCE VALUE= .4519 CRITERION= .7125E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .2945E-01
HT FLOW CONVERGENCE VALUE= .1027E-01 CRITERION= .7125E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 23 SUBSTEP 1 COMPLETED. CUM ITER = 69
*** TIME = .631152E+09 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 28321.330 TIME= 23:10:55
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:10:56 OCT 28, 1995 CP= 28321.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 210.8 CRITERION= .2195
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 11.46
HT FLOW CONVERGENCE VALUE= 3.481 CRITERION= .6195E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.7432
HT FLOW CONVERGENCE VALUE= .2153 CRITERION= .6195E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1397E-01
HT FLOW CONVERGENCE VALUE= .3791E-02 CRITERION= .6195E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 24 SUBSTEP 1 COMPLETED. CUM ITER = 72
*** TIME = .946728E+09 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 28975.540 TIME= 23:33:33
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:33:34 OCT 28, 1995 CP= 28975.990
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 100.7 CRITERION= .1143
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 5.080
HT FLOW CONVERGENCE VALUE= 1.436 CRITERION= .5455E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2824
HT FLOW CONVERGENCE VALUE= .7786E-01 CRITERION= .5455E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .5566E-02
HT FLOW CONVERGENCE VALUE= .1192E-02 CRITERION= .5455E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 25 SUBSTEP 1 COMPLETED. CUM ITER = 75
*** TIME = .126230E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 29629.750 TIME= 23:56:12
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:56:12 OCT 28, 1995 CP= 29630.200
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 48.27 CRITERION= .6827E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.349
HT FLOW CONVERGENCE VALUE= .6224 CRITERION= .4863E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1137
HT FLOW CONVERGENCE VALUE= .2982E-01 CRITERION= .4863E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 26 SUBSTEP 1 COMPLETED. CUM ITER = 77
*** TIME = .157788E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 30092.010 TIME= 00:12:30
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:12:30 OCT 29, 1995 CP= 30092.450
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 21.97 CRITERION= .4887E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.022
HT FLOW CONVERGENCE VALUE= .3236 CRITERION= .4391E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5010E-01
HT FLOW CONVERGENCE VALUE= .1165E-01 CRITERION= .4391E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 1 COMPLETED. CUM ITER = 79
*** TIME = .189346E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 30558.430 TIME= 00:28:53
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:28:53 OCT 29, 1995 CP= 30558.870
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 4.971 CRITERION= .4026E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.266
HT FLOW CONVERGENCE VALUE= .2475 CRITERION= .4013E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2031E-01
HT FLOW CONVERGENCE VALUE= .3107E-02 CRITERION= .4013E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 28 SUBSTEP 1 COMPLETED. CUM ITER = 81
*** TIME = .220903E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31019.270 TIME= 00:45:11
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:45:11 OCT 29, 1995 CP= 31019.710
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 14.51 CRITERION= .3972E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.600
HT FLOW CONVERGENCE VALUE= .3243 CRITERION= .3710E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3717E-01
HT FLOW CONVERGENCE VALUE= .4961E-02 CRITERION= .3710E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 29 SUBSTEP 1 COMPLETED. CUM ITER = 83
*** TIME = .252461E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31485.320 TIME= 01:01:33
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:01:34 OCT 29, 1995 CP= 31485.760
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 15.27 CRITERION= .3780E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.271
HT FLOW CONVERGENCE VALUE= .2857 CRITERION= .3467E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3633E-01
HT FLOW CONVERGENCE VALUE= .4730E-02 CRITERION= .3467E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 30 SUBSTEP 1 COMPLETED. CUM ITER = 85
*** TIME = .284018E+10 TIME INC = .315576E+09
NSUBST,22,60,20,ON

Apply loads and solve for 100 to 1000 years

*DO LOOP ON PARAMETER= TM FROM .31558E+10 TO .31558E+11 BY .31558E+10

TIME= .31558E+10

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
484.278374 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 175.696156 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31952.020 TIME= 01:17:56
This load step will be a static (steady-state) step.

*** NOTE *** CP= 31952.460 TIME= 01:17:56
The step data was checked and warning messages were found.
Please review output or errors file (glsp21x2.err) for these warning messages.

*** NOTE *** CP= 31952.470 TIME= 01:17:56
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:17:56 OCT 29, 1995 CP= 31952.470
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 31
TIME AT END OF THE LOAD STEP. 31558E+10
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 15.60 CRITERION= .3618E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.995
HT FLOW CONVERGENCE VALUE= .2552 CRITERION= .3271E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3499E-01
HT FLOW CONVERGENCE VALUE= .4453E-02 CRITERION= .3271E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 31 SUBSTEP 1 COMPLETED. CUM ITER = 87
*** TIME = .315576E+10 TIME INC = .315576E+09

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 32417.940 TIME= 01:34:18
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:34:18 OCT 29, 1995 CP= 32418.380
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 91.48 CRITERION= .9460E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -9.182
HT FLOW CONVERGENCE VALUE= .6970 CRITERION= .2523E-01

EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1078
HT FLOW CONVERGENCE VALUE= .1077E-01 CRITERION= .2523E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 32 SUBSTEP 1 COMPLETED. CUM ITER = 89
*** TIME = .631152E+10 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 32879.890 TIME= 01:50:36
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:50:36 OCT 29, 1995 CP= 32880.330
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 88.26 CRITERION= .9140E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -5.303
HT FLOW CONVERGENCE VALUE= .7370 CRITERION= .2378E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1421
HT FLOW CONVERGENCE VALUE= .1457E-01 CRITERION= .2378E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 1 COMPLETED. CUM ITER = 91
*** TIME = .946728E+10 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 33346.210 TIME= 01:06:59
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:07:00 OCT 29, 1995 CP= 33346.650
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 45.28 CRITERION= .5084E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.742
HT FLOW CONVERGENCE VALUE= .4029 CRITERION= .2312E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7597E-01
HT FLOW CONVERGENCE VALUE= .7662E-02 CRITERION= .2312E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 34 SUBSTEP 1 COMPLETED. CUM ITER = 93
*** TIME = .126230E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 33807.100 TIME= 01:23:17
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:23:17 OCT 29, 1995 CP= 33807.540
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 28.69 CRITERION= .3655E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.803
HT FLOW CONVERGENCE VALUE= .2599 CRITERION= .2265E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .4868E-01
HT FLOW CONVERGENCE VALUE= .4848E-02 CRITERION= .2265E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 35 SUBSTEP 1 COMPLETED. CUM ITER = 95

*** TIME = .157788E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 34273.120 TIME= 01:39:39
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:39:39 OCT 29, 1995 CP= 34273.560
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= .4024E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.015
HT FLOW CONVERGENCE VALUE= .3006 CRITERION= .2226E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .5700E-01
HT FLOW CONVERGENCE VALUE= .5656E-02 CRITERION= .2226E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 36 SUBSTEP 1 COMPLETED. CUM ITER = 97
*** TIME = .189346E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 34739.420 TIME= 01:56:01
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:56:01 OCT 29, 1995 CP= 34739.860
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 39.85 CRITERION= .4548E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.336
HT FLOW CONVERGENCE VALUE= .3565 CRITERION= .2192E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .6845E-01
HT FLOW CONVERGENCE VALUE= .6776E-02 CRITERION= .2192E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 37 SUBSTEP 1 COMPLETED. CUM ITER = 99
*** TIME = .220903E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 35205.470 TIME= 02:12:23
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:12:24 OCT 29, 1995 CP= 35205.910
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 43.24 CRITERION= .4835E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.523
HT FLOW CONVERGENCE VALUE= .3893 CRITERION= .2163E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7557E-01
HT FLOW CONVERGENCE VALUE= .7465E-02 CRITERION= .2163E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 38 SUBSTEP 1 COMPLETED. CUM ITER = 101
*** TIME = .252461E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 35667.890 TIME= 02:28:42
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:28:42 OCT 29, 1995 CP= 35668.330
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 41.17 CRITERION= .4638E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.427
HT FLOW CONVERGENCE VALUE= .3749 CRITERION= .2137E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7348E-01
HT FLOW CONVERGENCE VALUE= .7238E-02 CRITERION= .2137E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 39 SUBSTEP 1 COMPLETED. CUM ITER = 103
*** TIME = .284018E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 36135.330 TIME= 02:45:04
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:45:04 OCT 29, 1995 CP= 36135.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 36.79 CRITERION= .4243E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.204
HT FLOW CONVERGENCE VALUE= .3391 CRITERION= .2113E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .6704E-01
HT FLOW CONVERGENCE VALUE= .6581E-02 CRITERION= .2113E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 1 COMPLETED. CUM ITER = 105
*** TIME = .315576E+11 TIME INC = .315576E+10

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 36593.590

Create element contour plots of solution results

Sort through solution results for time of max temp.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 03:01:17 OCT 29, 1995 CP= 36593.590
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

VARIABLE 2 IS AT NODE 7655 ITEM= TEMP COMP= NAME= peakgls

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	7655 TEMP	peakgls	128.3	31.56	209.3	.9467E+09

*GET TMTMAX FROM VARI 2 ITEM=EXTR TMAX VALUE= 946728032.

***** ROUTINE COMPLETED ***** CP = 36593.950

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 03:01:20 OCT 29, 1995 CP= 36593.990
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

***** ANSYS RESULTS INTERPRETATION (POST1) *****
Create temperature contour plots of WP at peak

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 1.0000 1.0000

DISTANCE FOR WINDOW 1 3.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER

ELEMENT OUTLINE STYLE FOR WINDOW 1 IS -1 0=DEFAULT, 1=ALTERNATE, -1=NONE
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 135.00
KABS= 0. TOLERANCE= .000000E+00

18 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

240 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
18 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00

KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 45.000
KABS= 0. TOLERANCE= .000000E+00

27 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

600 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
27 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3800 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3992 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .94673E+09

SET COMMAND GOT LOAD STEP= 24 SUBSTEP= 1 CUMULATIVE ITERATION= 72
TIME/FREQUENCY= .94673E+09

TITLE=
DHLW WP at Time of Peak Temp. (30.000001 years)

/SHOW SWITCH PLOTS TO FILE solupk.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 AUTOMATIC CONTOURS

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solupk.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at Time of Peak Temp. (30.000001 years)

*** WARNING *** CP= 36633.990 TIME= 03:02:18
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 36634.020 TIME= 03:02:18
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

Create temperature contour plots at 5, 10, 50, and 100 yrs

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .15779E+09

SET COMMAND GOT LOAD STEP= 17 SUBSTEP= 1 CUMULATIVE ITERATION= 51
TIME/FREQUENCY= .15779E+09

TITLE=
DHLW WP at 5 years

/SHOW SWITCH PLOTS TO FILE solu5.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 169.56 BY .32056 TO 210.27

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu5.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 5 years

*** WARNING *** CP= 36681.730 TIME= 03:03:12
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 36681.770 TIME= 03:03:12
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .31558E+09

SET COMMAND GOT LOAD STEP= 22 SUBSTEP= 1 CUMULATIVE ITERATION= 66
TIME/FREQUENCY= .31558E+09

TITLE=
DHLW WP at 10 years

/SHOW SWITCH PLOTS TO FILE solu10.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 169.56 BY .32056 TO 210.27

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu10.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 10 years

*** WARNING *** CP= 36728.810 TIME= 03:04:05
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 36728.840 TIME= 03:04:05
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .78886E-30

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 6
TIME/FREQUENCY= .10000E-05

TITLE=
DHLW WP at 50 years

/SHOW SWITCH PLOTS TO FILE solu50.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 169.56 BY .32056 TO 210.27

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu50.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 50 years

*** WARNING *** CP= 36748.200 TIME= 03:04:28
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 36748.230 TIME= 03:04:28
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .31558E+10

SET COMMAND GOT LOAD STEP= 31 SUBSTEP= 1 CUMULATIVE ITERATION= 87
TIME/FREQUENCY= .31558E+10

TITLE=
DHLW WP at 100 years

/SHOW SWITCH PLOTS TO FILE solu100.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 169.56 BY .32056 TO 210.27

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu100.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 100 years

*** WARNING *** CP= 36795.060 TIME= 03:05:24
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 36795.090 TIME= 03:05:24
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED ***** CP = 36803.860

Print time/temperature output at specific locations
Save profile from center to edge

Variable Legend: A01i000

t = structural stainless Canister near center line
 c = center of Glass log
 h = halfway between center and Canister
 s = structural stainless Canister
 i = inner barrier of DC
 o = outer barrier of DC
 ## = cartesian quadrant number of Canister
 i = side of assembly toward center of WP
 o = side of assembly toward edge of WP
 045 = profile 45 deg down
 135 = profile 45 deg up

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:33 OCT 29, 1995 CP= 36803.860
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

MAXIMUM NUMBER OF VARIABLES= 32

 Temperature Profile from center to lower right (45 deg.) z=2/3

VARIABLE 2 IS AT NODE 7952 ITEM= TEMP COMP= NAME= t94i045
 VARIABLE 3 IS AT NODE 7726 ITEM= TEMP COMP= NAME= t94o045
 VARIABLE 4 IS AT NODE 7730 ITEM= TEMP COMP= NAME= h94i045
 VARIABLE 5 IS AT NODE 7654 ITEM= TEMP COMP= NAME= c94i045
 VARIABLE 6 IS AT NODE 7686 ITEM= TEMP COMP= NAME= h94o045
 VARIABLE 7 IS AT NODE 7667 ITEM= TEMP COMP= NAME= s94i045
 VARIABLE 8 IS AT NODE 7929 ITEM= TEMP COMP= NAME= s94o045
 VARIABLE 9 IS AT NODE 8013 ITEM= TEMP COMP= NAME= i94i045
 VARIABLE 10 IS AT NODE 8030 ITEM= TEMP COMP= NAME= i94o045
 VARIABLE 11 IS AT NODE 8145 ITEM= TEMP COMP= NAME= o94o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	7952 TEMP	t94i045	123.6	.2000E-05	202.8	.1262E+10
3	NSOL	7726 TEMP	t94o045	123.7	.2000E-05	202.8	.1262E+10
4	NSOL	7730 TEMP	h94i045	133.0	.2000E-05	209.5	.9467E+09
5	NSOL	7654 TEMP	c94i045	129.9	31.56	209.0	.9467E+09
6	NSOL	7686 TEMP	h94o045	114.2	31.56	201.4	.1262E+10
7	NSOL	7667 TEMP	s94i045	86.80	31.56	188.0	.1578E+10
8	NSOL	7929 TEMP	s94o045	86.63	31.56	188.0	.1578E+10
9	NSOL	8013 TEMP	i94i045	56.49	31.56	182.4	.1893E+10
10	NSOL	8030 TEMP	i94o045	56.16	31.56	182.3	.1893E+10
11	NSOL	8145 TEMP	o94o045	55.81	31.56	182.1	.1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****

38303 VERSION=HP 9000/7XX 03:05:38 OCT 29, 1995 CP= 36806.010
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7952 TEMP t94i045	7726 TEMP t94o045	7730 TEMP h94i045	7654 TEMP c94i045	7686 TEMP h94o045	7667 TEMP s94i045
.10000E-05	123.649	123.710	132.980	129.892	114.185	86.8055
.20000E-05	123.647	123.708	132.978	129.889	114.183	86.8033
31.558	123.647	123.708	132.978	129.889	114.183	86.8032
.31558E+07	134.492	134.553	144.138	141.384	126.014	98.9521
.63116E+07	139.481	139.543	149.263	146.665	131.463	104.571
.94673E+07	142.983	143.046	152.854	150.366	135.288	108.527
.12623E+08	145.734	145.797	155.672	153.269	138.293	111.643
.15779E+08	148.015	148.077	158.004	155.673	140.785	114.235
.18935E+08	149.970	150.032	160.001	157.731	142.922	116.464
.22090E+08	151.689	151.752	161.754	159.539	144.802	118.429
.25246E+08	153.211	153.274	163.304	161.138	146.467	120.174
.28402E+08	154.583	154.645	164.699	162.576	147.967	121.751
.31558E+08	155.843	155.905	165.979	163.896	149.346	123.204
.63115E+08	164.718	164.780	174.939	173.143	159.070	133.566
.94673E+08	170.321	170.384	180.530	178.919	165.222	140.263
.12623E+09	174.689	174.751	184.850	183.383	170.020	145.565
.15779E+09	178.447	178.508	188.544	187.199	174.146	150.168
.18935E+09	181.565	181.625	191.581	190.340	177.572	154.045
.22090E+09	184.080	184.139	194.002	192.845	180.341	157.243
.25246E+09	186.284	186.342	196.105	195.023	182.770	160.084
.28402E+09	187.827	187.885	197.533	196.508	184.485	162.189
.31558E+09	189.030	189.086	198.614	197.636	185.832	163.911
.63115E+09	197.158	197.207	205.577	204.924	194.955	176.270
.94673E+09	202.071	202.114	209.491	209.023	200.449	184.283
.12623E+10	202.787	202.825	209.339	208.951	201.426	187.215
.15779E+10	201.933	201.967	207.771	207.424	200.717	188.048
.18935E+10	200.523	200.553	205.781	205.458	199.395	187.952
.22090E+10	198.784	198.811	203.573	203.264	197.712	187.247
.25246E+10	196.646	196.672	201.054	200.751	195.604	185.917
.28402E+10	194.750	194.774	198.852	198.555	193.733	184.672
.31558E+10	193.062	193.084	196.918	196.625	192.065	183.507
.63115E+10	185.029	185.046	187.950	187.676	184.118	177.485
.94673E+10	180.085	180.101	182.806	182.517	179.136	172.859
.12623E+11	177.517	177.532	180.146	179.850	176.548	170.434
.15779E+11	175.831	175.846	178.395	178.096	174.853	168.857
.18935E+11	173.932	173.947	176.441	176.135	172.939	167.038
.22090E+11	171.720	171.735	174.177	173.863	170.703	164.882
.25246E+11	169.323	169.338	171.733	171.409	168.279	162.526
.28402E+11	167.016	167.030	169.382	169.049	165.945	160.251
.31558E+11	164.919	164.934	167.247	166.906	163.826	158.185

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:38 OCT 29, 1995 CP= 36806.020
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7929 TEMP s94o045	8013 TEMP i94i045	8030 TEMP i94o045	8145 TEMP o94o045
.10000E-05	86.6361	56.4905	56.1598	55.8062
.20000E-05	86.6339	56.4895	56.1588	55.8053
31.558	86.6338	56.4893	56.1586	55.8051
.31558E+07	98.7867	72.2602	71.9319	71.5790

.63116E+07	104.408	79.3811	79.0542	78.7020
.94673E+07	108.365	84.3232	83.9974	83.6458
.12623E+08	111.483	88.1890	87.8641	87.5132
.15779E+08	114.076	91.3866	91.0626	90.7123
.18935E+08	116.306	94.1250	93.8020	93.4524
.22090E+08	118.272	96.5308	96.2094	95.8604
.25246E+08	120.017	98.6617	98.3416	97.9934
.28402E+08	121.595	100.584	100.265	99.9173
.31558E+08	123.049	102.350	102.033	101.687
.63115E+08	133.417	114.882	114.575	114.243
.94673E+08	140.118	122.927	122.628	122.306
.12623E+09	145.423	129.268	128.977	128.664
.15779E+09	150.030	134.744	134.462	134.156
.18935E+09	153.910	139.352	139.076	138.778
.22090E+09	157.111	143.162	142.892	142.601
.25246E+09	159.954	146.545	146.281	145.996
.28402E+09	162.062	149.091	148.833	148.554
.31558E+09	163.786	151.198	150.945	150.671
.63115E+09	176.164	166.381	166.168	165.940
.94673E+09	184.192	176.206	176.024	175.829
.12623E+10	187.136	180.272	180.113	179.942
.15779E+10	187.978	181.909	181.767	181.615
.18935E+10	187.889	182.415	182.287	182.149
.22090E+10	187.188	182.167	182.050	181.924
.25246E+10	185.863	181.181	181.073	180.957
.28402E+10	184.621	180.211	180.110	180.001
.31558E+10	183.459	179.266	179.170	179.067
.63115E+10	177.447	174.079	174.004	173.924
.94673E+10	172.824	169.540	169.469	169.393
.12623E+11	170.399	167.150	167.080	167.006
.15779E+11	168.823	165.603	165.535	165.462
.18935E+11	167.004	163.797	163.730	163.658
.22090E+11	164.848	161.638	161.572	161.501
.25246E+11	162.493	159.269	159.204	159.133
.28402E+11	160.218	156.979	156.914	156.844
.31558E+11	158.153	154.899	154.834	154.765

 * Temperature Profile from center to lower right (45 deg.) *

VARIABLE 2 IS AT NODE 7947 ITEM= TEMP COMP= NAME= t04i045

*** WARNING *** CP= 36806.230 TIME= 03:05:38
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 7718 ITEM= TEMP COMP= NAME= t04o045

VARIABLE 4 IS AT NODE 7720 ITEM= TEMP COMP= NAME= h04i045

VARIABLE 5 IS AT NODE 7642 ITEM= TEMP COMP= NAME= c04i045

VARIABLE 6 IS AT NODE 7679 ITEM= TEMP COMP= NAME= h04o045

VARIABLE 7 IS AT NODE 7662 ITEM= TEMP COMP= NAME= s04i045

VARIABLE 8 IS AT NODE 7927 ITEM= TEMP COMP= NAME= s04o045

VARIABLE 9 IS AT NODE 8008 ITEM= TEMP COMP= NAME= i04i045

VARIABLE 10 IS AT NODE 8027 ITEM= TEMP COMP= NAME= i04o045

VARIABLE 11 IS AT NODE 8142 ITEM= TEMP COMP= NAME= o04o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	7947 TEMP	t04i045	122.6	.2000E-05	202.6	.1262E+10

3	NSOL	7718 TEMP	t04o045	122.6	.2000E-05	202.6	.1262E+10
4	NSOL	7720 TEMP	h04i045	132.0	31.56	209.5	.9467E+09
5	NSOL	7642 TEMP	c04i045	128.6	31.56	208.9	.9467E+09
6	NSOL	7679 TEMP	h04o045	113.0	31.56	201.3	.1262E+10
7	NSOL	7662 TEMP	s04i045	85.35	31.56	187.8	.1578E+10
8	NSOL	7927 TEMP	s04o045	85.19	31.56	187.7	.1578E+10
9	NSOL	8008 TEMP	i04i045	55.44	31.56	182.3	.1893E+10
10	NSOL	8027 TEMP	i04o045	55.10	31.56	182.2	.1893E+10
11	NSOL	8142 TEMP	o04o045	54.75	31.56	182.1	.1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:40 OCT 29, 1995 CP= 36808.170
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7947 TEMP t04i045	7718 TEMP t04o045	7720 TEMP h04i045	7642 TEMP c04i045	7679 TEMP h04o045	7662 TEMP s04i045
.10000E-05	122.562	122.627	131.990	128.604	112.987	85.3533
.20000E-05	122.560	122.625	131.988	128.602	112.985	85.3512
31.558	122.560	122.625	131.988	128.602	112.985	85.3511
.31558E+07	133.575	133.641	143.351	140.317	125.031	97.7085
.63116E+07	138.634	138.700	148.560	145.689	130.569	103.414
.94673E+07	142.181	142.248	152.205	149.450	134.451	107.424
.12623E+08	144.965	145.032	155.063	152.398	137.499	110.583
.15779E+08	147.273	147.340	157.428	154.837	140.026	113.209
.18935E+08	149.250	149.317	159.451	156.926	142.192	115.466
.22090E+08	150.988	151.056	161.228	158.760	144.097	117.455
.25246E+08	152.527	152.594	162.798	160.380	145.783	119.221
.28402E+08	153.913	153.981	164.211	161.839	147.303	120.817
.31558E+08	155.187	155.254	165.507	163.177	148.700	122.287
.63115E+08	164.152	164.220	174.574	172.546	158.540	132.763
.94673E+08	169.808	169.876	180.227	178.392	164.758	139.528
.12623E+09	174.216	174.282	184.592	182.909	169.606	144.880
.15779E+09	178.006	178.072	188.321	186.768	173.772	149.525
.18935E+09	181.150	181.215	191.387	189.944	177.231	153.438
.22090E+09	183.686	183.750	193.830	192.477	180.026	156.665
.25246E+09	185.908	185.972	195.952	194.679	182.477	159.531
.28402E+09	187.466	187.529	197.394	196.182	184.210	161.656
.31558E+09	188.681	188.742	198.487	197.326	185.570	163.395
.63115E+09	196.894	196.947	205.518	204.714	194.785	175.877
.94673E+09	201.858	201.905	209.463	208.870	200.329	183.967
.12623E+10	202.603	202.645	209.321	208.824	201.329	186.945
.15779E+10	201.770	201.807	207.756	207.313	200.632	187.809
.18935E+10	200.374	200.407	205.766	205.356	199.318	187.737
.22090E+10	198.645	198.676	203.557	203.169	197.640	187.048
.25246E+10	196.515	196.543	201.036	200.660	195.535	185.732
.28402E+10	194.626	194.652	198.833	198.467	193.666	184.497
.31558E+10	192.942	192.967	196.897	196.540	192.000	183.340
.63115E+10	184.929	184.948	187.925	187.601	184.059	177.349
.94673E+10	179.985	180.003	182.775	182.439	179.074	172.726
.12623E+11	177.416	177.433	180.112	179.770	176.484	170.301
.15779E+11	175.731	175.747	178.360	178.015	174.789	168.725
.18935E+11	173.831	173.848	176.403	176.053	172.873	166.906
.22090E+11	171.618	171.634	174.137	173.779	170.635	164.749
.25246E+11	169.220	169.235	171.690	171.322	168.209	162.391
.28402E+11	166.910	166.926	169.336	168.959	165.872	160.116
.31558E+11	164.813	164.828	167.198	166.813	163.750	158.049

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:40 OCT 29, 1995 CP= 36808.180
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7927 TEMP s04o045	8008 TEMP i04i045	8027 TEMP i04o045	8142 TEMP o04o045
.10000E-05	85.1874	55.4367	55.0989	54.7531
.20000E-05	85.1853	55.4359	55.0981	54.7522
31.558	85.1853	55.4357	55.0979	54.7520
.31558E+07	97.5463	71.4295	71.0947	70.7486
.63116E+07	103.253	78.6353	78.3021	77.9565
.94673E+07	107.266	83.6308	83.2989	82.9537
.12623E+08	110.426	87.5359	87.2050	86.8603
.15779E+08	113.052	90.7644	90.4345	90.0904
.18935E+08	115.310	93.5282	93.1994	92.8558
.22090E+08	117.300	95.9557	95.6284	95.2853
.25246E+08	119.067	98.1049	97.7792	97.4367
.28402E+08	120.664	100.043	99.7189	99.3769
.31558E+08	122.134	101.825	101.502	101.161
.63115E+08	132.616	114.447	114.135	113.807
.94673E+08	139.385	122.541	122.238	121.920
.12623E+09	144.741	128.918	128.623	128.314
.15779E+09	149.390	134.424	134.137	133.835
.18935E+09	153.305	139.055	138.774	138.480
.22090E+09	156.534	142.883	142.609	142.322
.25246E+09	159.403	146.282	146.014	145.733
.28402E+09	161.531	148.841	148.579	148.303
.31558E+09	163.272	150.958	150.701	150.431
.63115E+09	175.773	166.210	165.995	165.769
.94673E+09	183.878	176.075	175.891	175.697
.12623E+10	186.866	180.162	180.001	179.832
.15779E+10	187.740	181.813	181.669	181.519
.18935E+10	187.674	182.329	182.199	182.063
.22090E+10	186.991	182.088	181.970	181.845
.25246E+10	185.678	181.108	180.998	180.883
.28402E+10	184.447	180.141	180.039	179.931
.31558E+10	183.293	179.199	179.102	179.001
.63115E+10	177.312	174.024	173.949	173.869
.94673E+10	172.691	169.486	169.414	169.339
.12623E+11	170.267	167.095	167.025	166.952
.15779E+11	168.692	165.549	165.480	165.408
.18935E+11	166.873	163.743	163.675	163.603
.22090E+11	164.716	161.583	161.516	161.446
.25246E+11	162.359	159.213	159.147	159.077
.28402E+11	160.084	156.922	156.856	156.787
.31558E+11	158.017	154.841	154.776	154.707

 * Temperature Profile from center to upper right (135 deg.) *

VARIABLE 2 IS AT NODE 63 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 36808.390 TIME= 03:05:41
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 20 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 22 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 1 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 11 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 6 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 58 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 84 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 106 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 124 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	63 TEMP	t01i135	122.6	.2000E-05	202.6	.1262E+10
3	NSOL	20 TEMP	t01o135	122.6	.2000E-05	202.6	.1262E+10
4	NSOL	22 TEMP	h01i135	132.0	31.56	209.5	.9467E+09
5	NSOL	1 TEMP	c01i135	128.6	31.56	208.9	.9467E+09
6	NSOL	11 TEMP	h01o135	112.9	31.56	201.3	.1262E+10
7	NSOL	6 TEMP	s01i135	85.30	31.56	187.8	.1578E+10
8	NSOL	58 TEMP	s01o135	85.13	31.56	187.7	.1578E+10
9	NSOL	84 TEMP	i01i135	55.35	31.56	182.3	.1893E+10
10	NSOL	106 TEMP	i01o135	55.01	31.56	182.2	.1893E+10
11	NSOL	124 TEMP	o01o135	54.67	31.56	182.0	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:42 OCT 29, 1995 CP= 36810.320
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	63 TEMP t01i135	20 TEMP t01o135	22 TEMP h01i135	1 TEMP c01i135	11 TEMP h01o135	6 TEMP s01i135
.10000E-05	122.555	122.620	131.970	128.572	112.944	85.2992
.20000E-05	122.553	122.618	131.968	128.570	112.942	85.2972
31.558	122.553	122.618	131.968	128.570	112.942	85.2971
.31558E+07	133.569	133.635	143.332	140.287	124.990	97.6568
.63116E+07	138.628	138.694	148.541	145.660	130.528	103.363
.94673E+07	142.175	142.242	152.187	149.421	134.411	107.375
.12623E+08	144.960	145.027	155.045	152.369	137.460	110.534
.15779E+08	147.267	147.334	157.410	154.809	139.988	113.160
.18935E+08	149.245	149.312	159.434	156.898	142.154	115.418
.22090E+08	150.983	151.051	161.211	158.732	144.059	117.408
.25246E+08	152.522	152.589	162.781	160.353	145.746	119.174
.28402E+08	153.908	153.976	164.194	161.812	147.266	120.770
.31558E+08	155.182	155.249	165.490	163.151	148.663	122.241
.63115E+08	164.148	164.215	174.559	172.521	158.505	132.720
.94673E+08	169.804	169.872	180.212	178.368	164.726	139.486
.12623E+09	174.212	174.279	184.578	182.886	169.575	144.841
.15779E+09	178.002	178.068	188.308	186.746	173.742	149.487
.18935E+09	181.147	181.212	191.374	189.922	177.201	153.401
.22090E+09	183.683	183.747	193.818	192.456	179.998	156.629
.25246E+09	185.905	185.969	195.940	194.659	182.450	159.496
.28402E+09	187.463	187.526	197.382	196.162	184.183	161.623
.31558E+09	188.678	188.740	198.475	197.307	185.544	163.362
.63115E+09	196.892	196.945	205.508	204.699	194.764	175.851
.94673E+09	201.857	201.904	209.456	208.857	200.311	183.945
.12623E+10	202.602	202.643	209.315	208.813	201.313	186.925
.15779E+10	201.768	201.805	207.750	207.303	200.618	187.792
.18935E+10	200.372	200.406	205.760	205.347	199.305	187.721
.22090E+10	198.644	198.674	203.552	203.161	197.629	187.034
.25246E+10	196.514	196.542	201.031	200.653	195.524	185.719
.28402E+10	194.624	194.651	198.828	198.460	193.656	184.484
.31558E+10	192.941	192.966	196.893	196.533	191.990	183.328
.63115E+10	184.928	184.947	187.921	187.595	184.052	177.339
.94673E+10	179.984	180.002	182.772	182.433	179.066	172.717

.12623E+11	177.415	177.433	180.109	179.764	176.477	170.292
.15779E+11	175.730	175.746	178.357	178.010	174.781	168.716
.18935E+11	173.831	173.847	176.400	176.048	172.866	166.897
.22090E+11	171.617	171.633	174.134	173.773	170.628	164.740
.25246E+11	169.219	169.235	171.686	171.317	168.202	162.383
.28402E+11	166.909	166.925	169.332	168.954	165.865	160.107
.31558E+11	164.812	164.827	167.195	166.808	163.743	158.040

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:42 OCT 29, 1995 CP= 36810.330
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	58 TEMP s01o135	84 TEMP 1011135	106 TEMP 101o135	124 TEMP o01o135
.10000E-05	85.1333	55.3528	55.0147	54.6678
.20000E-05	85.1312	55.3519	55.0139	54.6669
31.558	85.1312	55.3517	55.0137	54.6667
.31558E+07	97.4945	71.3536	71.0185	70.6714
.63116E+07	103.203	78.5628	78.2294	77.8828
.94673E+07	107.216	83.5607	83.2285	82.8823
.12623E+08	110.377	87.4675	87.1364	86.7907
.15779E+08	113.004	90.6975	90.3674	90.0222
.18935E+08	115.262	93.4626	93.1335	92.7888
.22090E+08	117.253	95.8911	95.5636	95.2194
.25246E+08	119.020	98.0413	97.7154	97.3718
.28402E+08	120.617	99.9804	99.6559	99.3128
.31558E+08	122.088	101.763	101.440	101.098
.63115E+08	132.573	114.390	114.078	113.750
.94673E+08	139.344	122.489	122.185	121.866
.12623E+09	144.702	128.868	128.573	128.263
.15779E+09	149.352	134.376	134.089	133.787
.18935E+09	153.268	139.009	138.729	138.434
.22090E+09	156.499	142.840	142.566	142.277
.25246E+09	159.368	146.240	145.972	145.690
.28402E+09	161.497	148.800	148.538	148.262
.31558E+09	163.239	150.919	150.661	150.390
.63115E+09	175.747	166.179	165.964	165.737
.94673E+09	183.856	176.049	175.865	175.671
.12623E+10	186.847	180.140	179.979	179.809
.15779E+10	187.723	181.794	181.650	181.499
.18935E+10	187.658	182.311	182.182	182.045
.22090E+10	186.977	182.072	181.954	181.829
.25246E+10	185.665	181.093	180.983	180.868
.28402E+10	184.434	180.127	180.025	179.917
.31558E+10	183.281	179.186	179.089	178.987
.63115E+10	177.303	174.014	173.938	173.859
.94673E+10	172.682	169.476	169.404	169.328
.12623E+11	170.258	167.085	167.015	166.941
.15779E+11	168.683	165.539	165.470	165.398
.18935E+11	166.864	163.733	163.665	163.593
.22090E+11	164.708	161.573	161.506	161.436
.25246E+11	162.351	159.204	159.137	159.067
.28402E+11	160.075	156.912	156.846	156.777
.31558E+11	158.008	154.832	154.766	154.697

 * Temp. Prof. from center to lower right (45 deg.) z=glass bot *

VARIABLE 2 IS AT NODE 7951 ITEM= TEMP COMP= NAME= tb4i045

*** WARNING *** CP= 36810.540 TIME= 03:05:43
 NSOL command erases all previously stored or calculated data

unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 7722 ITEM= TEMP COMP= NAME= tb4o045
 VARIABLE 4 IS AT NODE 7724 ITEM= TEMP COMP= NAME= hb4i045
 VARIABLE 5 IS AT NODE 7650 ITEM= TEMP COMP= NAME= cb4i045
 VARIABLE 6 IS AT NODE 7682 ITEM= TEMP COMP= NAME= hb4o045
 VARIABLE 7 IS AT NODE 7666 ITEM= TEMP COMP= NAME= sb4i045
 VARIABLE 8 IS AT NODE 7928 ITEM= TEMP COMP= NAME= sb4o045
 VARIABLE 9 IS AT NODE 8012 ITEM= TEMP COMP= NAME= ib4i045
 VARIABLE 10 IS AT NODE 8029 ITEM= TEMP COMP= NAME= ib4o045
 VARIABLE 11 IS AT NODE 8144 ITEM= TEMP COMP= NAME= ob4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	7951 TEMP	tb4i045	97.24	31.56	193.3	.1578E+10
3	NSOL	7722 TEMP	tb4o045	97.17	31.56	193.2	.1578E+10
4	NSOL	7724 TEMP	hb4i045	91.11	31.56	190.5	.1578E+10
5	NSOL	7650 TEMP	cb4i045	86.41	31.56	188.9	.1578E+10
6	NSOL	7682 TEMP	hb4o045	80.89	31.56	187.1	.1578E+10
7	NSOL	7666 TEMP	sb4i045	74.51	31.56	185.1	.1893E+10
8	NSOL	7928 TEMP	sb4o045	74.44	31.56	185.0	.1893E+10
9	NSOL	8012 TEMP	ib4i045	52.63	31.56	181.5	.1893E+10
10	NSOL	8029 TEMP	ib4o045	52.36	31.56	181.4	.1893E+10
11	NSOL	8144 TEMP	ob4o045	52.08	31.56	181.3	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:45 OCT 29, 1995 CP= 36812.470
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7951 TEMP tb4i045	7722 TEMP tb4o045	7724 TEMP hb4i045	7650 TEMP cb4i045	7682 TEMP hb4o045	7666 TEMP sb4i045
.10000E-05	97.2472	97.1707	91.1076	86.4160	80.8947	74.5154
.20000E-05	97.2445	97.1680	91.1051	86.4138	80.8926	74.5135
31.558	97.2444	97.1679	91.1050	86.4137	80.8925	74.5134
.31558E+07	109.576	109.499	103.504	99.0065	93.7426	87.6251
.63116E+07	115.245	115.168	109.213	104.810	99.6698	93.6792
.94673E+07	119.224	119.147	113.224	108.885	103.832	97.9316
.12623E+08	122.352	122.274	116.378	112.093	107.108	101.280
.15779E+08	124.946	124.869	118.997	114.757	109.830	104.063
.18935E+08	127.172	127.095	121.246	117.045	112.169	106.456
.22090E+08	129.131	129.053	123.226	119.061	114.231	108.565
.25246E+08	130.867	130.789	124.983	120.850	116.060	110.437
.28402E+08	132.432	132.355	126.568	122.465	117.713	112.130
.31558E+08	133.871	133.794	128.026	123.952	119.235	113.690
.63115E+08	144.064	143.987	138.383	134.528	130.084	124.826
.94673E+08	150.579	150.503	145.034	141.336	137.083	132.031
.12623E+09	155.698	155.624	150.276	146.710	142.616	137.738
.15779E+09	160.121	160.047	154.814	151.365	147.412	142.690
.18935E+09	163.821	163.749	158.624	155.279	151.450	146.866
.22090E+09	166.847	166.776	161.752	158.500	154.781	150.318
.25246E+09	169.519	169.449	164.523	161.357	157.738	153.388

.28402E+09	171.463	171.394	166.559	163.467	159.936	155.684
.31558E+09	173.027	172.959	168.211	165.188	161.736	157.575
.63115E+09	184.017	183.959	179.951	177.473	174.651	171.221
.94673E+09	190.960	190.909	187.467	185.377	183.002	180.100
.12623E+10	193.073	193.028	190.011	188.192	186.125	183.596
.15779E+10	193.265	193.225	190.540	188.922	187.086	184.839
.18935E+10	192.661	192.625	190.202	188.741	187.082	185.053
.22090E+10	191.553	191.520	189.304	187.964	186.444	184.586
.25246E+10	189.903	189.873	187.821	186.576	185.163	183.438
.28402E+10	188.401	188.373	186.452	185.283	183.956	182.338
.31558E+10	187.029	187.003	185.188	184.080	182.822	181.290
.63115E+10	180.216	180.195	178.786	177.911	176.916	175.712
.94673E+10	175.444	175.425	174.088	173.249	172.293	171.141
.12623E+11	172.951	172.932	171.629	170.806	169.868	168.739
.15779E+11	171.325	171.307	170.028	169.217	168.292	167.181
.18935E+11	169.466	169.447	168.189	167.385	166.470	165.372
.22090E+11	167.275	167.258	166.015	165.217	164.308	163.219
.25246E+11	164.890	164.872	163.643	162.849	161.944	160.861
.28402E+11	162.589	162.571	161.354	160.564	159.661	158.583
.31558E+11	160.499	160.482	159.276	158.488	157.588	156.515

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:45 OCT 29, 1995 CP= 36812.480
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7928 TEMP	8012 TEMP	8029 TEMP	8144 TEMP
	sb4o045	ib4i045	ib4o045	ob4o045
.10000E-05	74.4456	52.6309	52.3604	52.0783
.20000E-05	74.4438	52.6302	52.3597	52.0775
31.558	74.4437	52.6300	52.3595	52.0774
.31558E+07	87.5585	68.6368	68.3678	68.0884
.63116E+07	93.6141	75.8712	75.6032	75.3254
.94673E+07	97.8677	80.8925	80.6252	80.3486
.12623E+08	101.217	84.8212	84.5546	84.2791
.15779E+08	104.001	88.0718	87.8058	87.5311
.18935E+08	106.394	90.8561	90.5908	90.3170
.22090E+08	108.504	93.3033	93.0387	92.7657
.25246E+08	110.377	95.4711	95.2076	94.9354
.28402E+08	112.070	97.4268	97.1644	96.8929
.31558E+08	113.630	99.2255	98.9641	98.6932
.63115E+08	124.770	112.007	111.755	111.496
.94673E+08	131.977	120.218	119.972	119.721
.12623E+09	137.686	126.692	126.452	126.210
.15779E+09	142.640	132.283	132.050	131.814
.18935E+09	146.817	136.989	136.762	136.532
.22090E+09	150.271	140.883	140.661	140.437
.25246E+09	153.342	144.342	144.125	143.906
.28402E+09	155.639	146.953	146.740	146.525
.31558E+09	157.531	149.116	148.908	148.697
.63115E+09	171.185	164.728	164.553	164.378
.94673E+09	180.069	174.840	174.690	174.541
.12623E+10	183.570	179.093	178.963	178.832
.15779E+10	184.815	180.867	180.750	180.634
.18935E+10	185.032	181.476	181.371	181.266
.22090E+10	184.567	181.307	181.211	181.116
.25246E+10	183.420	180.382	180.293	180.205
.28402E+10	182.321	179.460	179.377	179.294
.31558E+10	181.274	178.554	178.475	178.397
.63115E+10	175.699	173.514	173.453	173.392
.94673E+10	171.129	168.995	168.937	168.879
.12623E+11	168.727	166.613	166.556	166.499
.15779E+11	167.169	165.073	165.017	164.961
.18935E+11	165.360	163.271	163.216	163.161

.22090E+11	163.207	161.114	161.060	161.005
.25246E+11	160.850	158.746	158.692	158.638
.28402E+11	158.572	156.455	156.402	156.348
.31558E+11	156.504	154.375	154.322	154.269

 * Temp. Prof. from center to upper right (135 deg.) z=glass bot*

VARIABLE 2 IS AT NODE 1033 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 36812.690 TIME= 03:05:45
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 733 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 735 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 679 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 704 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 691 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 1018 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 1292 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 1307 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 2078 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM AT TIME
2	NSOL	1033 TEMP	t01i135	97.23	31.56	193.3 .1578E+10
3	NSOL	733 TEMP	t01o135	97.16	31.56	193.2 .1578E+10
4	NSOL	735 TEMP	h01i135	91.08	31.56	190.5 .1578E+10
5	NSOL	679 TEMP	c01i135	86.38	31.56	188.9 .1578E+10
6	NSOL	704 TEMP	h01o135	80.85	31.56	187.1 .1578E+10
7	NSOL	691 TEMP	s01i135	74.46	31.56	185.0 .1893E+10
8	NSOL	1018 TEMP	s01o135	74.39	31.56	185.0 .1893E+10
9	NSOL	1292 TEMP	i01i135	52.55	31.56	181.5 .1893E+10
10	NSOL	1307 TEMP	i01o135	52.28	31.56	181.4 .1893E+10
11	NSOL	2078 TEMP	o01o135	52.00	31.56	181.2 .1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:47 OCT 29, 1995 CP= 36814.620
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1033 TEMP t01i135	733 TEMP t01o135	735 TEMP h01i135	679 TEMP c01i135	704 TEMP h01o135	691 TEMP s01i135
.10000E-05	97.2345	97.1579	91.0832	86.3816	80.8511	74.4629
.20000E-05	97.2319	97.1553	91.0807	86.3794	80.8491	74.4610
31.558	97.2318	97.1551	91.0806	86.3793	80.8490	74.4609
.31558E+07	109.565	109.488	103.481	98.9739	93.7013	87.5752
.63116E+07	115.234	115.157	109.191	104.778	99.6297	93.6305
.94673E+07	119.214	119.136	113.202	108.854	103.792	97.8839
.12623E+08	122.341	122.264	116.356	112.062	107.069	101.233

.15779E+08	124.936	124.858	118.976	114.727	109.792	104.017
.18935E+08	127.162	127.084	121.225	117.016	112.132	106.410
.22090E+08	129.121	129.044	123.206	119.032	114.193	108.519
.25246E+08	130.857	130.780	124.962	120.821	116.023	110.393
.28402E+08	132.422	132.345	126.548	122.436	117.677	112.086
.31558E+08	133.862	133.784	128.006	123.923	119.199	113.646
.63115E+08	144.055	143.979	138.364	134.502	130.050	124.785
.94673E+08	150.571	150.495	145.017	141.311	137.051	131.992
.12623E+09	155.691	155.616	150.259	146.686	142.585	137.700
.15779E+09	160.114	160.040	154.797	151.341	147.383	142.654
.18935E+09	163.815	163.742	158.608	155.256	151.421	146.831
.22090E+09	166.841	166.769	161.737	158.478	154.754	150.285
.25246E+09	169.513	169.443	164.508	161.335	157.712	153.356
.28402E+09	171.457	171.387	166.544	163.446	159.910	155.653
.31558E+09	173.022	172.954	168.197	165.167	161.711	157.544
.63115E+09	184.012	183.954	179.939	177.456	174.631	171.196
.94673E+09	190.956	190.906	187.457	185.363	182.985	180.079
.12623E+10	193.069	193.025	190.003	188.180	186.111	183.579
.15779E+10	193.262	193.222	190.532	188.912	187.073	184.823
.18935E+10	192.659	192.623	190.195	188.731	187.070	185.039
.22090E+10	191.550	191.517	189.297	187.955	186.433	184.573
.25246E+10	189.901	189.871	187.815	186.568	185.153	183.426
.28402E+10	188.399	188.371	186.447	185.276	183.947	182.327
.31558E+10	187.027	187.001	185.183	184.073	182.813	181.279
.63115E+10	180.214	180.194	178.782	177.905	176.909	175.703
.94673E+10	175.442	175.423	174.084	173.243	172.286	171.133
.12623E+11	172.950	172.931	171.625	170.800	169.861	168.730
.15779E+11	171.324	171.305	170.024	169.211	168.285	167.173
.18935E+11	169.464	169.446	168.185	167.380	166.464	165.364
.22090E+11	167.274	167.256	166.011	165.212	164.302	163.211
.25246E+11	164.888	164.871	163.639	162.844	161.937	160.853
.28402E+11	162.587	162.570	161.351	160.558	159.654	158.575
.31558E+11	160.497	160.480	159.272	158.483	157.581	156.507

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:47 OCT 29, 1995 CP= 36814.630
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1018 TEMP	1292 TEMP	1307 TEMP	2078 TEMP
	s01o135	i01i135	i01o135	o01o135
.10000E-05	74.3930	52.5521	52.2815	51.9991
.20000E-05	74.3912	52.5513	52.2808	51.9983
31.558	74.3910	52.5512	52.2806	51.9982
.31558E+07	87.5085	68.5652	68.2961	68.0165
.63116E+07	93.5654	75.8028	75.5347	75.2567
.94673E+07	97.8199	80.8261	80.5588	80.2820
.12623E+08	101.170	84.7565	84.4898	84.2141
.15779E+08	103.954	88.0084	87.7423	87.4675
.18935E+08	106.348	90.7939	90.5285	90.2545
.22090E+08	108.458	93.2421	92.9773	92.7042
.25246E+08	110.332	95.4107	95.1471	94.8748
.28402E+08	112.026	97.3673	97.1047	96.8331
.31558E+08	113.586	99.1667	98.9052	98.6341
.63115E+08	124.728	111.954	111.701	111.442
.94673E+08	131.938	120.168	119.922	119.671
.12623E+09	137.648	126.644	126.405	126.162
.15779E+09	142.604	132.238	132.005	131.769
.18935E+09	146.782	136.946	136.719	136.489
.22090E+09	150.238	140.842	140.620	140.395
.25246E+09	153.309	144.302	144.085	143.866
.28402E+09	155.608	146.914	146.701	146.486
.31558E+09	157.500	149.079	148.870	148.659
.63115E+09	171.160	164.699	164.524	164.349

.94673E+09	180.048	174.816	174.666	174.517
.12623E+10	183.552	179.073	178.942	178.812
.15779E+10	184.799	180.848	180.732	180.616
.18935E+10	185.018	181.459	181.354	181.250
.22090E+10	184.553	181.292	181.196	181.101
.25246E+10	183.408	180.368	180.279	180.191
.28402E+10	182.310	179.447	179.364	179.281
.31558E+10	181.263	178.542	178.463	178.385
.63115E+10	175.691	173.504	173.443	173.382
.94673E+10	171.121	168.985	168.927	168.869
.12623E+11	168.718	166.603	166.546	166.490
.15779E+11	167.161	165.064	165.008	164.952
.18935E+11	165.352	163.262	163.206	163.151
.22090E+11	163.199	161.105	161.050	160.996
.25246E+11	160.842	158.736	158.682	158.628
.28402E+11	158.564	156.446	156.392	156.339
.31558E+11	156.496	154.366	154.313	154.259

 * Temp. Prof. from center to lower right (45 deg.) z=glass top *

VARIABLE 2 IS AT NODE 8470 ITEM= TEMP COMP= NAME= tt4i045

*** WARNING *** CP= 36814.840 TIME= 03:05:47
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 8270 ITEM= TEMP COMP= NAME= tt4o045

VARIABLE 4 IS AT NODE 8272 ITEM= TEMP COMP= NAME= ht4i045

VARIABLE 5 IS AT NODE 8234 ITEM= TEMP COMP= NAME= ct4i045

VARIABLE 6 IS AT NODE 8251 ITEM= TEMP COMP= NAME= ht4o045

VARIABLE 7 IS AT NODE 8242 ITEM= TEMP COMP= NAME= st4i045

VARIABLE 8 IS AT NODE 8460 ITEM= TEMP COMP= NAME= st4o045

VARIABLE 9 IS AT NODE 8556 ITEM= TEMP COMP= NAME= it4i045

VARIABLE 10 IS AT NODE 8566 ITEM= TEMP COMP= NAME= it4o045

VARIABLE 11 IS AT NODE 8691 ITEM= TEMP COMP= NAME= ot4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
 VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2 NSOL	8470 TEMP	tt4i045	98.63	31.56	194.2	.1578E+10
3 NSOL	8270 TEMP	tt4o045	98.67	31.56	194.2	.1578E+10
4 NSOL	8272 TEMP	ht4i045	115.0	31.56	203.6	.1262E+10
5 NSOL	8234 TEMP	ct4i045	114.4	31.56	204.5	.1262E+10
6 NSOL	8251 TEMP	ht4o045	98.37	31.56	197.3	.1262E+10
7 NSOL	8242 TEMP	st4i045	66.59	31.56	183.9	.1893E+10
8 NSOL	8460 TEMP	st4o045	66.48	31.56	183.8	.1893E+10
9 NSOL	8556 TEMP	it4i045	47.06	31.56	180.7	.1893E+10
10 NSOL	8566 TEMP	it4o045	46.85	31.56	180.7	.1893E+10
11 NSOL	8691 TEMP	ot4o045	46.63	31.56	180.6	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:49 OCT 29, 1995 CP= 36816.770
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8470 TEMP tt4i045	8270 TEMP tt4o045	8272 TEMP ht4i045	8234 TEMP ct4i045	8251 TEMP ht4o045	8242 TEMP st4i045
.10000E-05	98.6302	98.6754	114.956	114.367	98.3683	66.5933
.20000E-05	98.6280	98.6732	114.954	114.365	98.3668	66.5922
31.558	98.6279	98.6732	114.954	114.365	98.3667	66.5921
.31558E+07	111.227	111.273	127.560	127.256	111.755	80.7925
.63116E+07	116.981	117.026	133.312	133.141	117.876	87.2948
.94673E+07	121.004	121.049	137.327	137.247	122.149	91.8400
.12623E+08	124.159	124.204	140.472	140.462	125.499	95.4096
.15779E+08	126.772	126.817	143.072	143.121	128.273	98.3709
.18935E+08	129.012	129.057	145.297	145.397	130.649	100.913
.22090E+08	130.980	131.025	147.251	147.394	132.737	103.150
.25246E+08	132.723	132.768	148.978	149.159	134.585	105.134
.28402E+08	134.295	134.340	150.532	150.748	136.250	106.926
.31558E+08	135.739	135.784	151.959	152.207	137.780	108.576
.63115E+08	145.944	145.988	161.970	162.435	148.570	120.329
.94673E+08	152.437	152.481	168.248	168.841	155.398	127.903
.12623E+09	157.526	157.569	173.118	173.804	160.726	133.892
.15779E+09	161.916	161.958	177.288	178.049	165.304	139.079
.18935E+09	165.583	165.625	180.736	181.554	169.112	143.448
.22090E+09	168.576	168.617	183.509	184.371	172.205	147.061
.25246E+09	171.215	171.256	185.932	186.828	174.922	150.272
.28402E+09	173.129	173.169	187.628	188.545	176.875	152.681
.31558E+09	174.665	174.704	188.950	189.880	178.431	154.670
.63115E+09	185.402	185.436	197.758	198.728	189.117	169.016
.94673E+09	192.145	192.175	202.938	203.875	195.640	178.327
.12623E+10	194.112	194.138	203.632	204.486	197.273	182.083
.15779E+10	194.193	194.216	202.687	203.456	197.034	183.505
.18935E+10	193.504	193.525	201.173	201.866	196.067	183.852
.22090E+10	192.327	192.347	199.335	199.963	194.656	183.484
.25246E+10	190.625	190.643	197.101	197.672	192.753	182.411
.28402E+10	189.080	189.097	195.128	195.653	191.047	181.370
.31558E+10	187.674	187.690	193.378	193.866	189.511	180.368
.63115E+10	180.727	180.740	185.115	185.463	182.067	174.968
.94673E+10	175.934	175.945	180.062	180.369	177.140	170.412
.12623E+11	173.431	173.442	177.441	177.729	174.576	168.015
.15779E+11	171.797	171.808	175.723	175.998	172.900	166.462
.18935E+11	169.932	169.943	173.787	174.050	170.996	164.654
.22090E+11	167.738	167.748	171.532	171.782	168.761	162.499
.25246E+11	165.349	165.359	169.088	169.325	166.332	160.136
.28402E+11	163.045	163.055	166.735	166.960	163.991	157.852
.31558E+11	160.952	160.962	164.599	164.813	161.865	155.779

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:49 OCT 29, 1995 CP= 36816.780
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8460 TEMP st4o045	8556 TEMP tt4i045	8566 TEMP tt4o045	8691 TEMP ot4o045
.10000E-05	66.4849	47.0563	46.8489	46.6266
.20000E-05	66.4837	47.0559	46.8485	46.6262
31.558	66.4836	47.0558	46.8484	46.6260
.31558E+07	80.6879	63.9916	63.7866	63.5656
.63116E+07	87.1918	71.5877	71.3839	71.1638
.94673E+07	91.7383	76.8401	76.6372	76.4177
.12623E+08	95.3089	80.9406	80.7385	80.5197
.15779E+08	98.2711	84.3277	84.1262	83.9080
.18935E+08	100.814	87.2252	87.0244	86.8067
.22090E+08	103.051	89.7691	89.5689	89.3518

.25246E+08	105.036	92.0209	91.8213	91.6047
.28402E+08	106.829	94.0509	93.8520	93.6358
.31558E+08	108.479	95.9162	95.7181	95.5024
.63115E+08	120.236	109.138	108.947	108.739
.94673E+08	127.814	117.602	117.417	117.216
.12623E+09	133.806	124.266	124.086	123.891
.15779E+09	138.995	130.014	129.839	129.649
.18935E+09	143.366	134.847	134.677	134.491
.22090E+09	146.982	138.847	138.680	138.499
.25246E+09	150.194	142.397	142.234	142.057
.28402E+09	152.605	145.081	144.921	144.748
.31558E+09	154.595	147.308	147.151	146.982
.63115E+09	168.953	163.366	163.235	163.094
.94673E+09	178.273	173.749	173.637	173.517
.12623E+10	182.036	178.166	178.068	177.963
.15779E+10	183.463	180.051	179.964	179.871
.18935E+10	183.814	180.744	180.665	180.581
.22090E+10	183.450	180.638	180.566	180.489
.25246E+10	182.378	179.759	179.693	179.621
.28402E+10	181.340	178.874	178.812	178.745
.31558E+10	180.340	177.997	177.939	177.875
.63115E+10	174.946	173.068	173.022	172.973
.94673E+10	170.391	168.559	168.516	168.469
.12623E+11	167.994	166.181	166.138	166.093
.15779E+11	166.442	164.645	164.603	164.558
.18935E+11	164.634	162.844	162.803	162.758
.22090E+11	162.479	160.686	160.646	160.602
.25246E+11	160.116	158.315	158.275	158.231
.28402E+11	157.833	156.022	155.982	155.939
.31558E+11	155.760	153.940	153.900	153.857

 * Temp. Prof. from center to upper right (135 deg.) z=glass top*

VARIABLE 2 IS AT NODE 1206 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 36816.990 TIME= 03:05:49
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 885 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 887 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 849 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 866 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 857 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 1196 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 1394 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 1404 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 2146 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	1206 TEMP	t01i135	98.62	31.56	194.2	.1578E+10
3 NSOL	885 TEMP	t01o135	98.67	31.56	194.2	.1578E+10
4 NSOL	887 TEMP	h01i135	114.9	31.56	203.6	.1262E+10
5 NSOL	849 TEMP	c01i135	114.3	31.56	204.5	.1262E+10
6 NSOL	866 TEMP	h01o135	98.33	31.56	197.3	.1262E+10
7 NSOL	857 TEMP	s01i135	66.54	31.56	183.8	.1893E+10

8 NSOL	1196 TEMP	s01o135	66.43	31.56	183.8	.1893E+10
9 NSOL	1394 TEMP	i01i135	46.98	31.56	180.7	.1893E+10
10 NSOL	1404 TEMP	i01o135	46.77	31.56	180.6	.1893E+10
11 NSOL	2146 TEMP	o01o135	46.54	31.56	180.6	.1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:51 OCT 29, 1995 CP= 36818.920
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1206 TEMP t01i135	885 TEMP t01o135	887 TEMP h01i135	849 TEMP c01i135	866 TEMP h01o135	857 TEMP s01i135
.10000E-05	98.6249	98.6700	114.938	114.337	98.3270	66.5410
.20000E-05	98.6227	98.6679	114.936	114.335	98.3255	66.5398
31.558	98.6227	98.6678	114.936	114.335	98.3254	66.5397
.31558E+07	111.223	111.268	127.543	127.227	111.716	80.7432
.63116E+07	116.976	117.022	133.295	133.113	117.838	87.2469
.94673E+07	121.000	121.045	137.311	137.220	122.112	91.7932
.12623E+08	124.155	124.200	140.456	140.436	125.463	95.3636
.15779E+08	126.768	126.814	143.056	143.095	128.237	98.3256
.18935E+08	129.008	129.053	145.282	145.371	130.614	100.868
.22090E+08	130.977	131.022	147.235	147.368	132.702	103.105
.25246E+08	132.720	132.765	148.963	149.134	134.550	105.090
.28402E+08	134.291	134.336	150.517	150.723	136.215	106.883
.31558E+08	135.736	135.780	151.944	152.182	137.746	108.533
.63115E+08	145.941	145.985	161.956	162.412	148.538	120.289
.94673E+08	152.435	152.478	168.235	168.819	155.368	127.866
.12623E+09	157.524	157.567	173.106	173.784	160.698	133.856
.15779E+09	161.914	161.956	177.276	178.029	165.277	139.044
.18935E+09	165.581	165.623	180.724	181.535	169.085	143.415
.22090E+09	168.574	168.615	183.498	184.352	172.179	147.030
.25246E+09	171.213	171.254	185.921	186.810	174.897	150.241
.28402E+09	173.127	173.167	187.618	188.528	176.851	152.651
.31558E+09	174.663	174.702	188.940	189.863	178.407	154.641
.63115E+09	185.401	185.435	197.750	198.714	189.098	168.993
.94673E+09	192.144	192.174	202.931	203.864	195.624	178.308
.12623E+10	194.111	194.137	203.626	204.476	197.259	182.066
.15779E+10	194.192	194.216	202.681	203.447	197.022	183.490
.18935E+10	193.503	193.524	201.168	201.858	196.056	183.838
.22090E+10	192.327	192.346	199.331	199.956	194.646	183.472
.25246E+10	190.624	190.642	197.097	197.665	192.744	182.399
.28402E+10	189.079	189.096	195.124	195.647	191.038	181.359
.31558E+10	187.673	187.689	193.374	193.860	189.503	180.358
.63115E+10	180.727	180.739	185.112	185.458	182.060	174.960
.94673E+10	175.933	175.945	180.059	180.365	177.134	170.404
.12623E+11	173.430	173.442	177.439	177.725	174.569	168.007
.15779E+11	171.797	171.808	175.720	175.994	172.894	166.454
.18935E+11	169.932	169.942	173.785	174.046	170.989	164.647
.22090E+11	167.737	167.748	171.529	171.777	168.755	162.491
.25246E+11	165.348	165.359	169.085	169.321	166.326	160.128
.28402E+11	163.044	163.054	166.733	166.956	163.984	157.845
.31558E+11	160.951	160.962	164.596	164.809	161.859	155.771

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:51 OCT 29, 1995 CP= 36818.930
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1196 TEMP	1394 TEMP	1404 TEMP	2146 TEMP
	s01o135	i01i135	i01o135	o01o135
.10000E-05	66.4324	46.9771	46.7693	46.5451
.20000E-05	66.4312	46.9767	46.7689	46.5447
31.558	66.4311	46.9766	46.7687	46.5446
.31558E+07	80.6385	63.9201	63.7146	63.4919
.63116E+07	87.1438	71.5194	71.3152	71.0934
.94673E+07	91.6914	76.7739	76.5706	76.3495
.12623E+08	95.2628	80.8761	80.6736	80.4531
.15779E+08	98.2257	84.2645	84.0627	83.8428
.18935E+08	100.769	87.1632	86.9620	86.7427
.22090E+08	103.007	89.7081	89.5075	89.2887
.25246E+08	104.993	91.9609	91.7608	91.5425
.28402E+08	106.786	93.9916	93.7923	93.5745
.31558E+08	108.436	95.8576	95.6591	95.4418
.63115E+08	120.197	109.084	108.893	108.684
.94673E+08	127.777	117.552	117.367	117.164
.12623E+09	133.770	124.219	124.039	123.842
.15779E+09	138.960	129.969	129.793	129.602
.18935E+09	143.333	134.805	134.633	134.447
.22090E+09	146.950	138.805	138.638	138.456
.25246E+09	150.163	142.357	142.194	142.016
.28402E+09	152.575	145.042	144.882	144.708
.31558E+09	154.566	147.270	147.114	146.943
.63115E+09	168.930	163.336	163.206	163.063
.94673E+09	178.254	173.725	173.613	173.492
.12623E+10	182.019	178.145	178.047	177.941
.15779E+10	183.448	180.033	179.946	179.852
.18935E+10	183.801	180.727	180.649	180.564
.22090E+10	183.438	180.623	180.551	180.473
.25246E+10	182.367	179.745	179.679	179.607
.28402E+10	181.329	178.861	178.799	178.732
.31558E+10	180.330	177.985	177.926	177.862
.63115E+10	174.938	173.058	173.012	172.963
.94673E+10	170.383	168.549	168.506	168.459
.12623E+11	167.986	166.171	166.129	166.083
.15779E+11	166.434	164.636	164.594	164.548
.18935E+11	164.627	162.835	162.793	162.749
.22090E+11	162.471	160.677	160.636	160.592
.25246E+11	160.109	158.306	158.266	158.222
.28402E+11	157.826	156.013	155.973	155.929
.31558E+11	155.752	153.930	153.891	153.847

 * Can. Center Line Temperature Profile in Quad 1 WP Top to Bot *

VARIABLE 2 IS AT NODE 2751 ITEM= TEMP COMP= NAME= ot1o135

*** WARNING *** CP= 36819.140 TIME= 03:05:51
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 2714 ITEM= TEMP COMP= NAME= ot1i135

VARIABLE 4 IS AT NODE 1968 ITEM= TEMP COMP= NAME= it1o135

VARIABLE 5 IS AT NODE 1931 ITEM= TEMP COMP= NAME= it1i135

VARIABLE 6 IS AT NODE 1088 ITEM= TEMP COMP= NAME= st1o135

VARIABLE 7 IS AT NODE 1082 ITEM= TEMP COMP= NAME= st1i135

VARIABLE 8 IS AT NODE 849 ITEM= TEMP COMP= NAME= ht1i135

VARIABLE 9 IS AT NODE 853 ITEM= TEMP COMP= NAME= gt1i135

VARIABLE 10 IS AT NODE 1 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 11 IS AT NODE 683 ITEM= TEMP COMP= NAME= gb1i135
 VARIABLE 12 IS AT NODE 684 ITEM= TEMP COMP= NAME= gb1h135
 VARIABLE 13 IS AT NODE 679 ITEM= TEMP COMP= NAME= sb1i135
 VARIABLE 14 IS AT NODE 962 ITEM= TEMP COMP= NAME= sb1o135
 VARIABLE 15 IS AT NODE 1640 ITEM= TEMP COMP= NAME= ib1i135
 VARIABLE 16 IS AT NODE 1677 ITEM= TEMP COMP= NAME= ib1o135
 VARIABLE 17 IS AT NODE 2751 ITEM= TEMP COMP= NAME= ob1o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	2751 TEMP	ot1o135	32.32	.1000E-05	178.2	.2209E+10
3 NSOL	2714 TEMP	ot1i135	32.35	.1000E-05	178.2	.2209E+10
4 NSOL	1968 TEMP	it1o135	44.23	31.56	180.6	.1893E+10
5 NSOL	1931 TEMP	it1i135	44.24	31.56	180.6	.1893E+10
6 NSOL	1088 TEMP	st1o135	46.01	31.56	180.5	.1893E+10
7 NSOL	1082 TEMP	st1i135	46.03	31.56	180.5	.1893E+10
8 NSOL	849 TEMP	ht1i135	114.3	31.56	204.5	.1262E+10
9 NSOL	853 TEMP	gt1i135	121.5	31.56	206.7	.1262E+10
10 NSOL	1 TEMP	c01i135	128.6	31.56	208.9	.9467E+09
11 NSOL	683 TEMP	gb1i135	129.9	31.56	209.0	.9467E+09
12 NSOL	684 TEMP	gb1h135	128.2	31.56	209.3	.9467E+09
13 NSOL	679 TEMP	sb1i135	86.38	31.56	188.9	.1578E+10
14 NSOL	962 TEMP	sb1o135	86.09	31.56	188.8	.1578E+10
15 NSOL	1640 TEMP	ib1i135	57.24	31.56	183.1	.1893E+10
16 NSOL	1677 TEMP	ib1o135	56.60	31.56	182.9	.1893E+10
17 NSOL	2751 TEMP	ob1o135	32.32	.1000E-05	178.2	.2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:54 OCT 29, 1995 CP= 36822.270
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2751 TEMP ot1o135	2714 TEMP ot1i135	1968 TEMP it1o135	1931 TEMP it1i135	1088 TEMP st1o135	1082 TEMP st1i135
.10000E-05	32.3155	32.3534	44.2291	44.2438	46.0103	46.0309
.20000E-05	32.3156	32.3536	44.2288	44.2436	46.0099	46.0305
31.558	32.3156	32.3535	44.2287	44.2435	46.0098	46.0304
.31558E+07	50.9513	50.9849	61.7548	61.7665	62.9085	62.9270
.63116E+07	59.2515	59.2833	69.5835	69.5941	70.5133	70.5309
.94673E+07	64.9682	64.9988	74.9852	74.9949	75.7798	75.7969
.12623E+08	69.4221	69.4518	79.1969	79.2060	79.8956	79.9122
.15779E+08	73.0956	73.1245	82.6725	82.6810	83.2978	83.3140
.18935E+08	76.2345	76.2628	85.6434	85.6515	86.2098	86.2258
.22090E+08	78.9876	79.0154	88.2499	88.2577	88.7676	88.7833
.25246E+08	81.4229	81.4502	90.5558	90.5632	91.0327	91.0481
.28402E+08	83.6168	83.6437	92.6337	92.6409	93.0754	93.0907
.31558E+08	85.6316	85.6581	94.5426	94.5495	94.9529	94.9680
.63115E+08	99.8963	99.9202	108.034	108.039	108.264	108.277
.94673E+08	109.036	109.059	116.657	116.661	116.795	116.808
.12623E+09	116.221	116.241	123.436	123.439	123.513	123.526
.15779E+09	122.405	122.425	129.272	129.275	129.306	129.318
.18935E+09	127.603	127.622	134.176	134.179	134.178	134.189
.22090E+09	131.908	131.926	138.231	138.233	138.210	138.221
.25246E+09	135.730	135.747	141.828	141.830	141.789	141.799

.28402E+09	138.635	138.652	144.547	144.549	144.496	144.506
.31558E+09	141.057	141.073	146.803	146.805	146.742	146.752
.63115E+09	158.531	158.543	163.046	163.047	162.939	162.947
.94673E+09	169.814	169.824	173.525	173.525	173.410	173.416
.12623E+10	174.797	174.806	177.985	177.985	177.877	177.883
.15779E+10	177.084	177.091	179.895	179.895	179.797	179.802
.18935E+10	178.077	178.084	180.603	180.603	180.514	180.518
.22090E+10	178.200	178.207	180.508	180.508	180.426	180.430
.25246E+10	177.494	177.500	179.635	179.635	179.560	179.564
.28402E+10	176.747	176.752	178.754	178.754	178.686	178.689
.31558E+10	175.980	175.985	177.881	177.881	177.817	177.820
.63115E+10	171.465	171.469	172.965	172.965	172.919	172.922
.94673E+10	167.005	167.009	168.451	168.451	168.412	168.414
.12623E+11	164.647	164.651	166.070	166.070	166.034	166.036
.15779E+11	163.128	163.132	164.532	164.532	164.498	164.501
.18935E+11	161.336	161.340	162.729	162.729	162.697	162.700
.22090E+11	159.181	159.185	160.568	160.568	160.538	160.541
.25246E+11	156.808	156.811	158.193	158.193	158.166	158.168
.28402E+11	154.511	154.515	155.895	155.895	155.871	155.874
.31558E+11	152.425	152.429	153.809	153.809	153.787	153.790

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=WP 9000/7XX 03:05:54 OCT 29, 1995 CP= 36822.280
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	849 TEMP ht1i135	853 TEMP gt1i135	1 TEMP c01i135	683 TEMP gb1i135	684 TEMP gb1h135	679 TEMP sb1i135
.10000E-05	114.337	121.483	128.572	129.860	128.249	86.3816
.20000E-05	114.335	121.481	128.570	129.857	128.247	86.3794
31.558	114.335	121.481	128.570	129.857	128.247	86.3793
.31558E+07	127.227	133.791	140.287	141.353	140.075	98.9739
.63116E+07	133.113	139.422	145.660	146.635	145.506	104.778
.94673E+07	137.220	143.357	149.421	150.336	149.310	108.854
.12623E+08	140.436	146.439	152.369	153.240	152.294	112.062
.15779E+08	143.095	148.990	154.809	155.645	154.763	114.727
.18935E+08	145.371	151.172	156.898	157.703	156.877	117.016
.22090E+08	147.368	153.088	158.732	159.512	158.734	119.032
.25246E+08	149.134	154.781	160.353	161.110	160.375	120.821
.28402E+08	150.723	156.306	161.812	162.549	161.852	122.436
.31558E+08	152.182	157.704	163.151	163.869	163.207	123.923
.63115E+08	162.412	167.504	172.521	173.118	172.696	134.502
.94673E+08	168.819	173.631	178.368	178.895	178.618	141.311
.12623E+09	173.784	178.371	182.886	183.360	183.191	146.686
.15779E+09	178.029	182.423	186.746	187.177	187.097	151.341
.18935E+09	181.535	185.763	189.922	190.319	190.308	155.256
.22090E+09	184.352	188.438	192.456	192.824	192.869	158.478
.25246E+09	186.810	190.767	194.659	195.003	195.093	161.335
.28402E+09	188.528	192.377	196.162	196.488	196.609	163.446
.31558E+09	189.863	193.616	197.307	197.617	197.763	165.167
.63115E+09	198.714	201.731	204.699	204.908	205.183	177.456
.94673E+09	203.864	206.380	208.857	209.010	209.328	185.363
.12623E+10	204.476	206.661	208.813	208.940	209.239	188.180
.15779E+10	203.447	205.388	207.303	207.414	207.683	188.912
.18935E+10	201.858	203.615	205.347	205.449	205.686	188.731
.22090E+10	199.956	201.569	203.161	203.256	203.463	187.955
.25246E+10	197.665	199.168	200.653	200.744	200.924	186.568
.28402E+10	195.647	197.062	198.460	198.548	198.706	185.276
.31558E+10	193.860	195.204	196.533	196.618	196.759	184.073
.63115E+10	185.458	186.532	187.595	187.671	187.745	177.905
.94673E+10	180.365	181.404	182.433	182.512	182.559	173.243
.12623E+11	177.725	178.749	179.764	179.844	179.879	170.800
.15779E+11	175.994	177.006	178.010	178.090	178.116	169.211

.18935E+11	174.046	175.051	176.048	176.130	176.147	167.380
.22090E+11	171.777	172.779	173.773	173.858	173.864	165.212
.25246E+11	169.321	170.322	171.317	171.404	171.399	162.844
.28402E+11	166.956	167.958	168.954	169.044	169.028	160.558
.31558E+11	164.809	165.812	166.808	166.900	166.875	158.483

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:54 OCT 29, 1995 CP= 36822.290
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	962 TEMP	1640 TEMP	1677 TEMP	2751 TEMP
	sb1o135	ib1i135	ib1o135	ob1o135
.10000E-05	86.0963	57.2440	56.5999	32.3155
.20000E-05	86.0941	57.2431	56.5990	32.3156
31.558	86.0940	57.2428	56.5988	32.3156
.31558E+07	98.6928	73.1929	72.5499	50.9513
.63116E+07	104.499	80.3926	79.7508	59.2515
.94673E+07	108.578	85.3871	84.7464	64.9682
.12623E+08	111.787	89.2924	88.6528	69.4221
.15779E+08	114.453	92.5218	91.8832	73.0956
.18935E+08	116.743	95.2857	94.6492	76.2345
.22090E+08	118.760	97.7126	97.0788	78.9876
.25246E+08	120.550	99.8616	99.2302	81.4229
.28402E+08	122.167	101.799	101.170	83.6168
.31558E+08	123.655	103.578	102.951	85.6316
.63115E+08	134.241	116.172	115.563	99.8963
.94673E+08	141.056	124.242	123.648	109.036
.12623E+09	146.437	130.592	130.013	116.221
.15779E+09	151.098	136.071	135.506	122.405
.18935E+09	155.017	140.676	140.123	127.603
.22090E+09	158.244	144.479	143.938	131.908
.25246E+09	161.105	147.852	147.322	135.730
.28402E+09	163.220	150.386	149.866	138.635
.31558E+09	164.945	152.478	151.968	141.057
.63115E+09	177.267	167.508	167.079	158.531
.94673E+09	185.200	177.197	176.829	169.814
.12623E+10	188.036	181.146	180.823	174.797
.15779E+10	188.784	182.687	182.399	177.084
.18935E+10	188.616	183.116	182.856	178.077
.22090E+10	187.850	182.805	182.568	178.200
.25246E+10	186.470	181.769	181.549	177.494
.28402E+10	185.184	180.758	180.553	176.747
.31558E+10	183.986	179.780	179.586	175.980
.63115E+10	177.838	174.468	174.318	171.465
.94673E+10	173.179	169.903	169.760	167.005
.12623E+11	170.738	167.500	167.361	164.647
.15779E+11	169.150	165.945	165.808	163.128
.18935E+11	167.320	164.131	163.996	161.336
.22090E+11	165.153	161.965	161.832	159.181
.25246E+11	162.786	159.589	159.457	156.808
.28402E+11	160.501	157.292	157.162	154.511
.31558E+11	158.425	155.206	155.077	152.425

 * Can. Center Line Temperature Profile in Quad 4 WP Top to Bot *

VARIABLE 2 IS AT NODE 9855 ITEM= TEMP COMP= NAME= ot4o045

*** WARNING *** CP= 36822.500 TIME= 03:05:55
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 9818 ITEM= TEMP COMP= NAME= ot4i045
 VARIABLE 4 IS AT NODE 9546 ITEM= TEMP COMP= NAME= it4o045
 VARIABLE 5 IS AT NODE 9509 ITEM= TEMP COMP= NAME= it4i045
 VARIABLE 6 IS AT NODE 8352 ITEM= TEMP COMP= NAME= st4o045
 VARIABLE 7 IS AT NODE 8346 ITEM= TEMP COMP= NAME= st4i045
 VARIABLE 8 IS AT NODE 8234 ITEM= TEMP COMP= NAME= ht4i045
 VARIABLE 9 IS AT NODE 8238 ITEM= TEMP COMP= NAME= gt4i045
 VARIABLE 10 IS AT NODE 7642 ITEM= TEMP COMP= NAME= c04i045
 VARIABLE 11 IS AT NODE 7654 ITEM= TEMP COMP= NAME= gb4i045
 VARIABLE 12 IS AT NODE 7655 ITEM= TEMP COMP= NAME= gb4h045
 VARIABLE 13 IS AT NODE 7650 ITEM= TEMP COMP= NAME= sb4i045
 VARIABLE 14 IS AT NODE 7871 ITEM= TEMP COMP= NAME= sb4o045
 VARIABLE 15 IS AT NODE 8934 ITEM= TEMP COMP= NAME= ib4i045
 VARIABLE 16 IS AT NODE 8971 ITEM= TEMP COMP= NAME= ib4o045
 VARIABLE 17 IS AT NODE 9855 ITEM= TEMP COMP= NAME= ob4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	9855 TEMP	ot4o045	32.33	.1000E-05	178.2	.2209E+10
3	NSOL	9818 TEMP	ot4i045	32.37	.1000E-05	178.2	.2209E+10
4	NSOL	9546 TEMP	it4o045	44.25	31.56	180.6	.1893E+10
5	NSOL	9509 TEMP	it4i045	44.26	31.56	180.6	.1893E+10
6	NSOL	8352 TEMP	st4o045	46.03	31.56	180.5	.1893E+10
7	NSOL	8346 TEMP	st4i045	46.05	31.56	180.5	.1893E+10
8	NSOL	8234 TEMP	ht4i045	114.4	31.56	204.5	.1262E+10
9	NSOL	8238 TEMP	gt4i045	121.5	31.56	206.7	.1262E+10
10	NSOL	7642 TEMP	c04i045	128.6	31.56	208.9	.9467E+09
11	NSOL	7654 TEMP	gb4i045	129.9	31.56	209.0	.9467E+09
12	NSOL	7655 TEMP	gb4h045	128.3	31.56	209.3	.9467E+09
13	NSOL	7650 TEMP	sb4i045	86.41	31.56	188.9	.1578E+10
14	NSOL	7871 TEMP	sb4o045	86.13	31.56	188.8	.1578E+10
15	NSOL	8934 TEMP	ib4i045	57.29	31.56	183.1	.1893E+10
16	NSOL	8971 TEMP	ib4o045	56.65	31.56	182.9	.1893E+10
17	NSOL	9855 TEMP	ob4o045	32.33	.1000E-05	178.2	.2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:58 OCT 29, 1995 CP= 36825.630
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9855 TEMP ot4o045	9818 TEMP ot4i045	9546 TEMP it4o045	9509 TEMP it4i045	8352 TEMP st4o045	8346 TEMP st4i045
.10000E-05	32.3330	32.3705	44.2468	44.2616	46.0296	46.0503
.20000E-05	32.3331	32.3707	44.2466	44.2614	46.0292	46.0498
31.558	32.3331	32.3706	44.2464	44.2612	46.0291	46.0497
.31558E+07	50.9657	50.9990	61.7701	61.7819	62.9253	62.9438

.63116E+07	59.2648	59.2963	69.5979	69.6085	70.5290	70.5466
.94673E+07	64.9807	65.0110	74.9990	75.0087	75.7949	75.8120
.12623E+08	69.4341	69.4635	79.2102	79.2193	79.9102	79.9268
.15779E+08	73.1071	73.1357	82.6854	82.6940	83.3119	83.3282
.18935E+08	76.2456	76.2737	85.6560	85.6641	86.2236	86.2396
.22090E+08	78.9984	79.0260	88.2623	88.2700	88.7811	88.7968
.25246E+08	81.4334	81.4604	90.5679	90.5754	91.0459	91.0614
.28402E+08	83.6271	83.6537	92.6457	92.6528	93.0884	93.1037
.31558E+08	85.6416	85.6679	94.5543	94.5612	94.9656	94.9807
.63115E+08	99.9049	99.9286	108.045	108.050	108.275	108.289
.94673E+08	109.044	109.066	116.666	116.671	116.806	116.818
.12623E+09	116.228	116.248	123.445	123.448	123.523	123.535
.15779E+09	122.412	122.431	129.281	129.284	129.316	129.327
.18935E+09	127.609	127.628	134.184	134.187	134.187	134.198
.22090E+09	131.914	131.932	138.238	138.241	138.218	138.229
.25246E+09	135.735	135.752	141.836	141.838	141.797	141.807
.28402E+09	138.641	138.657	144.555	144.556	144.503	144.513
.31558E+09	141.062	141.078	146.810	146.812	146.750	146.759
.63115E+09	158.534	158.547	163.051	163.052	162.945	162.953
.94673E+09	169.817	169.827	173.529	173.530	173.414	173.421
.12623E+10	174.800	174.808	177.989	177.989	177.881	177.886
.15779E+10	177.086	177.093	179.899	179.899	179.800	179.805
.18935E+10	178.079	178.086	180.606	180.606	180.517	180.521
.22090E+10	178.202	178.208	180.510	180.510	180.429	180.433
.25246E+10	177.496	177.502	179.637	179.637	179.563	179.567
.28402E+10	176.749	176.754	178.757	178.757	178.688	178.692
.31558E+10	175.981	175.986	177.883	177.883	177.819	177.822
.63115E+10	171.466	171.470	172.966	172.966	172.921	172.924
.94673E+10	167.006	167.010	168.452	168.453	168.413	168.416
.12623E+11	164.648	164.652	166.071	166.072	166.036	166.038
.15779E+11	163.129	163.133	164.534	164.534	164.500	164.503
.18935E+11	161.337	161.341	162.731	162.731	162.699	162.701
.22090E+11	159.182	159.186	160.569	160.570	160.540	160.543
.25246E+11	156.809	156.813	158.194	158.194	158.168	158.170
.28402E+11	154.512	154.516	155.897	155.897	155.873	155.875
.31558E+11	152.426	152.430	153.810	153.811	153.789	153.791

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7(X) 03:05:58 OCT 29, 1995 CP= 36825.640
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8234 TEMP ht4i045	8238 TEMP gt4i045	7642 TEMP c04i045	7654 TEMP gb4i045	7655 TEMP gb4h045	7650 TEMP sb4i045
.10000E-05	114.367	121.513	128.604	129.892	128.281	86.4160
.20000E-05	114.365	121.511	128.602	129.889	128.279	86.4138
31.558	114.365	121.511	128.602	129.889	128.279	86.4137
.31558E+07	127.256	133.820	140.317	141.384	140.105	99.0065
.63116E+07	133.141	139.451	145.689	146.665	145.536	104.810
.94673E+07	137.247	143.385	149.450	150.366	149.339	108.885
.12623E+08	140.462	146.467	152.398	153.269	152.322	112.093
.15779E+08	143.121	149.017	154.837	155.673	154.791	114.757
.18935E+08	145.397	151.199	156.926	157.731	156.905	117.045
.22090E+08	147.394	153.114	158.760	159.539	158.761	119.061
.25246E+08	149.159	154.808	160.380	161.138	160.402	120.850
.28402E+08	150.748	156.331	161.839	162.576	161.878	122.465
.31558E+08	152.207	157.730	163.177	163.896	163.233	123.952
.63115E+08	162.435	167.528	172.546	173.143	172.721	134.528
.94673E+08	168.841	173.654	178.392	178.919	178.641	141.336
.12623E+09	173.804	178.393	182.909	183.383	183.214	146.710
.15779E+09	178.049	182.444	186.768	187.199	187.118	151.365
.18935E+09	181.554	185.783	189.944	190.340	190.329	155.279
.22090E+09	184.371	188.457	192.477	192.845	192.889	158.500

.25246E+09	186.828	190.786	194.679	195.023	195.112	161.357
.28402E+09	188.545	192.395	196.182	196.508	196.628	163.467
.31558E+09	189.880	193.634	197.326	197.636	197.781	165.188
.63115E+09	198.728	201.745	204.714	204.924	205.198	177.473
.94673E+09	203.875	206.392	208.870	209.023	209.340	185.377
.12623E+10	204.486	206.671	208.824	208.951	209.250	188.192
.15779E+10	203.456	205.398	207.313	207.424	207.692	188.922
.18935E+10	201.866	203.623	205.356	205.458	205.694	188.741
.22090E+10	199.963	201.576	203.169	203.264	203.471	187.964
.25246E+10	197.672	199.175	200.660	200.751	200.931	186.576
.28402E+10	195.653	197.069	198.467	198.555	198.713	185.283
.31558E+10	193.866	195.211	196.540	196.625	196.766	184.080
.63115E+10	185.463	186.537	187.601	187.676	187.751	177.911
.94673E+10	180.369	181.409	182.439	182.517	182.564	173.249
.12623E+11	177.729	178.754	179.770	179.850	179.884	170.806
.15779E+11	175.998	177.011	178.015	178.096	178.121	169.217
.18935E+11	174.050	175.056	176.053	176.135	176.152	167.385
.22090E+11	171.782	172.784	173.779	173.863	173.869	165.217
.25246E+11	169.325	170.327	171.322	171.409	171.404	162.849
.28402E+11	166.960	167.963	168.959	169.049	169.033	160.564
.31558E+11	164.813	165.816	166.813	166.906	166.880	158.488

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:05:58 OCT 29, 1995 CP= 36825.650
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7871 TEMP	8934 TEMP	8971 TEMP	9855 TEMP
	sb4o045	ib4i045	ib4o045	ob4o045
.10000E-05	86.1307	57.2923	56.6484	32.3330
.20000E-05	86.1285	57.2914	56.6475	32.3331
.31.558	86.1284	57.2912	56.6473	32.3331
.31558E+07	98.7255	73.2372	72.5944	50.9657
.63116E+07	104.531	80.4352	79.7936	59.2648
.94673E+07	108.609	85.4285	84.7880	64.9807
.12623E+08	111.818	89.3330	88.6935	69.4341
.15779E+08	114.483	92.5616	91.9232	73.1071
.18935E+08	116.773	95.3248	94.6886	76.2456
.22090E+08	118.790	97.7512	97.1176	78.9984
.25246E+08	120.580	99.8997	99.2686	81.4334
.28402E+08	122.196	101.837	101.208	83.6271
.31558E+08	123.684	103.615	102.988	85.6416
.63115E+08	134.268	116.206	115.597	99.9049
.94673E+08	141.082	124.274	123.680	109.044
.12623E+09	146.461	130.622	130.044	116.228
.15779E+09	151.121	136.100	135.535	122.412
.18935E+09	155.040	140.704	140.152	127.609
.22090E+09	158.266	144.506	143.965	131.914
.25246E+09	161.126	147.878	147.348	135.735
.28402E+09	163.240	150.411	149.891	138.641
.31558E+09	164.965	152.503	151.993	141.062
.63115E+09	177.283	167.528	167.099	158.534
.94673E+09	185.213	177.213	176.845	169.817
.12623E+10	188.048	181.160	180.837	174.800
.15779E+10	188.794	182.700	182.412	177.086
.18935E+10	188.625	183.127	182.867	178.079
.22090E+10	187.859	182.815	182.578	178.202
.25246E+10	186.478	181.779	181.559	177.496
.28402E+10	185.192	180.767	180.562	176.749
.31558E+10	183.994	179.789	179.595	175.981
.63115E+10	177.844	174.475	174.325	171.466
.94673E+10	173.185	169.909	169.767	167.006
.12623E+11	170.744	167.506	167.367	164.648
.15779E+11	169.156	165.951	165.815	163.129

.18935E+11	167.326	164.137	164.003	161.337
.22090E+11	165.158	161.971	161.838	159.182
.25246E+11	162.791	159.595	159.464	156.809
.28402E+11	160.506	157.298	157.168	154.512
.31558E+11	158.431	155.213	155.083	152.426

 * Can. Inner Surface Temperature Prof. in Quad 1 WP Top - Bot *

VARIABLE 2 IS AT NODE 2763 ITEM= TEMP COMP= NAME= otloise

*** WARNING *** CP= 36825.860 TIME= 03:05:58
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 2726 ITEM= TEMP COMP= NAME= otliise

VARIABLE 4 IS AT NODE 1980 ITEM= TEMP COMP= NAME= itloise

VARIABLE 5 IS AT NODE 1943 ITEM= TEMP COMP= NAME= itliise

VARIABLE 6 IS AT NODE 1281 ITEM= TEMP COMP= NAME= stloise

VARIABLE 7 IS AT NODE 1247 ITEM= TEMP COMP= NAME= stliise

VARIABLE 8 IS AT NODE 1206 ITEM= TEMP COMP= NAME= htliise

VARIABLE 9 IS AT NODE 1207 ITEM= TEMP COMP= NAME= gtliise

VARIABLE 10 IS AT NODE 63 ITEM= TEMP COMP= NAME= c0liise

VARIABLE 11 IS AT NODE 1034 ITEM= TEMP COMP= NAME= gbliise

VARIABLE 12 IS AT NODE 1035 ITEM= TEMP COMP= NAME= gb1hise

VARIABLE 13 IS AT NODE 1033 ITEM= TEMP COMP= NAME= sbliise

VARIABLE 14 IS AT NODE 1071 ITEM= TEMP COMP= NAME= sbloise

VARIABLE 15 IS AT NODE 1652 ITEM= TEMP COMP= NAME= ibliise

VARIABLE 16 IS AT NODE 1689 ITEM= TEMP COMP= NAME= ibloise

VARIABLE 17 IS AT NODE 2763 ITEM= TEMP COMP= NAME= obloise

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	2763 TEMP	otloise	31.50	.1000E-05	178.1	.2209E+10
3	NSOL	2726 TEMP	otliise	31.53	.1000E-05	178.1	.2209E+10
4	NSOL	1980 TEMP	itloise	49.81	31.56	182.1	.1893E+10
5	NSOL	1943 TEMP	itliise	49.85	31.56	182.1	.1893E+10
6	NSOL	1281 TEMP	stloise	56.34	31.56	183.3	.1893E+10
7	NSOL	1247 TEMP	stliise	56.84	31.56	183.5	.1893E+10
8	NSOL	1206 TEMP	htliise	98.62	31.56	194.2	.1578E+10
9	NSOL	1207 TEMP	gtliise	114.8	31.56	199.8	.1262E+10
10	NSOL	63 TEMP	c0liise	122.6	.2000E-05	202.6	.1262E+10
11	NSOL	1034 TEMP	gbliise	123.6	.2000E-05	202.8	.1262E+10
12	NSOL	1035 TEMP	gb1hise	115.9	.2000E-05	199.7	.1262E+10
13	NSOL	1033 TEMP	sbliise	97.23	31.56	193.3	.1578E+10
14	NSOL	1071 TEMP	sbloise	96.56	31.56	192.9	.1578E+10
15	NSOL	1652 TEMP	ibliise	60.55	31.56	184.4	.1893E+10
16	NSOL	1689 TEMP	ibloise	59.81	31.56	184.1	.1893E+10
17	NSOL	2763 TEMP	obloise	31.50	.1000E-05	178.1	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****

38303 VERSION=HP 9000/7XX 03:06:01 OCT 29, 1995 CP= 36828.990
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2763 TEMP ot1iise	2726 TEMP ot1iise	1980 TEMP it1iise	1943 TEMP it1iise	1281 TEMP st1iise	1247 TEMP st1iise
.10000E-05	31.4975	31.5252	49.8073	49.8548	56.3435	56.8374
.20000E-05	31.4977	31.5254	49.8068	49.8543	56.3426	56.8365
31.558	31.4976	31.5254	49.8066	49.8542	56.3424	56.8363
.31558E+07	50.2436	50.2675	66.9568	67.0017	72.5598	73.0423
.63116E+07	58.5892	58.6115	74.6237	74.6673	79.8762	80.3542
.94673E+07	64.3357	64.3570	79.9163	79.9592	84.9466	85.4214
.12623E+08	68.8123	68.8328	84.0432	84.0854	88.9093	89.3815
.15779E+08	72.5041	72.5239	87.4486	87.4903	92.1842	92.6541
.18935E+08	75.6584	75.6777	90.3592	90.4005	94.9862	95.4540
.22090E+08	78.4248	78.4436	92.9126	92.9535	97.4453	97.9109
.25246E+08	80.8716	80.8900	95.1701	95.2106	99.6212	100.085
.28402E+08	83.0759	83.0940	97.2018	97.2419	101.582	102.044
.31558E+08	85.1000	85.1178	99.0666	99.1063	103.383	103.843
.63115E+08	99.4275	99.4430	112.248	112.285	116.133	116.579
.94673E+08	108.608	108.622	120.663	120.699	124.284	124.718
.12623E+09	115.822	115.836	127.270	127.304	130.691	131.116
.15779E+09	122.032	122.044	132.957	132.990	136.212	136.628
.18935E+09	127.251	127.262	137.732	137.764	140.847	141.254
.22090E+09	131.573	131.584	141.675	141.705	144.672	145.071
.25246E+09	135.409	135.420	145.170	145.200	148.062	148.453
.28402E+09	138.327	138.337	147.801	147.831	150.606	150.990
.31558E+09	140.759	140.769	149.978	150.007	152.707	153.084
.63115E+09	158.307	158.314	165.608	165.631	167.768	168.090
.94673E+09	169.636	169.641	175.665	175.685	177.451	177.729
.12623E+10	174.646	174.651	179.837	179.854	181.375	181.619
.15779E+10	176.951	176.955	181.534	181.549	182.892	183.109
.18935E+10	177.958	177.962	182.077	182.090	183.300	183.495
.22090E+10	178.092	178.095	181.853	181.866	182.972	183.150
.25246E+10	177.394	177.397	180.881	180.893	181.920	182.085
.28402E+10	176.652	176.655	179.922	179.933	180.897	181.051
.31558E+10	175.890	175.892	178.985	178.995	179.909	180.055
.63115E+10	171.393	171.396	173.829	173.837	174.559	174.672
.94673E+10	166.935	166.937	169.278	169.286	169.982	170.088
.12623E+11	164.578	164.580	166.881	166.888	167.574	167.677
.15779E+11	163.059	163.062	165.331	165.338	166.015	166.116
.18935E+11	161.268	161.270	163.518	163.526	164.197	164.296
.22090E+11	159.112	159.115	161.351	161.358	162.026	162.124
.25246E+11	156.739	156.741	158.972	158.979	159.646	159.743
.28402E+11	154.442	154.444	156.671	156.678	157.345	157.441
.31558E+11	152.355	152.358	154.582	154.589	155.256	155.350

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:01 OCT 29, 1995 CP= 36829.000
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1206 TEMP ht1iise	1207 TEMP gt1iise	63 TEMP co1iise	1034 TEMP gb1iise	1035 TEMP gb1iise	1033 TEMP sb1iise
.10000E-05	98.6249	114.802	122.555	123.642	115.867	97.2345
.20000E-05	98.6227	114.800	122.553	123.640	115.864	97.2319
31.558	98.6227	114.800	122.553	123.640	115.864	97.2318

.31558E+07	111.223	126.334	133.569	134.486	127.068	109.565
.63116E+07	116.976	131.620	138.628	139.475	132.224	115.234
.94673E+07	121.000	135.323	142.175	142.978	135.847	119.214
.12623E+08	124.155	138.228	144.960	145.729	138.694	122.341
.15779E+08	126.768	140.635	147.267	148.010	141.055	124.936
.18935E+08	129.008	142.698	149.245	149.965	143.081	127.162
.22090E+08	130.977	144.511	150.983	151.684	144.862	129.121
.25246E+08	132.720	146.115	152.522	153.206	146.439	130.857
.28402E+08	134.291	147.561	153.908	154.578	147.861	132.422
.31558E+08	135.736	148.890	155.182	155.838	149.168	133.862
.63115E+08	145.941	158.254	164.148	164.713	158.395	144.055
.94673E+08	152.435	164.181	169.804	170.317	164.250	150.571
.12623E+09	157.524	168.808	174.212	174.686	168.828	155.691
.15779E+09	161.914	172.791	178.002	178.444	172.773	160.114
.18935E+09	165.581	176.103	181.147	181.562	176.058	163.815
.22090E+09	168.574	178.786	183.683	184.077	178.720	166.841
.25246E+09	171.213	181.143	185.905	186.281	181.060	169.513
.28402E+09	173.127	182.815	187.463	187.824	182.721	171.457
.31558E+09	174.663	184.133	188.678	189.027	184.031	173.022
.63115E+09	185.401	193.156	196.892	197.155	193.016	184.012
.94673E+09	192.144	198.694	201.857	202.069	198.549	190.956
.12623E+10	194.111	199.833	202.602	202.785	199.698	193.069
.15779E+10	194.192	199.295	201.768	201.932	199.173	193.262
.18935E+10	193.503	198.128	200.372	200.522	198.017	192.659
.22090E+10	192.327	196.579	198.644	198.782	196.477	191.550
.25246E+10	190.624	194.588	196.514	196.645	194.495	189.901
.28402E+10	189.079	192.810	194.624	194.749	192.725	188.399
.31558E+10	187.673	191.217	192.941	193.061	191.137	187.027
.63115E+10	180.727	183.551	184.928	185.028	183.495	180.214
.94673E+10	175.933	178.656	179.984	180.084	178.608	175.442
.12623E+11	173.430	176.109	177.415	177.516	176.065	172.950
.15779E+11	171.797	174.440	175.730	175.830	174.399	171.324
.18935E+11	169.932	172.552	173.831	173.931	172.514	169.464
.22090E+11	167.737	170.344	171.617	171.719	170.310	167.274
.25246E+11	165.348	167.949	169.219	169.322	167.918	164.888
.28402E+11	163.044	165.641	166.909	167.015	165.614	162.587
.31558E+11	160.951	163.545	164.812	164.919	163.521	160.497

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:01 OCT 29, 1995 CP= 36829.010
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1071 TEMP	1652 TEMP	1689 TEMP	2763 TEMP
	sbloise	ibliise	ibloise	obloise
.10000E-05	96.5622	60.5514	59.8089	31.4975
.20000E-05	96.5595	60.5503	59.8079	31.4977
31.558	96.5594	60.5501	59.8077	31.4976
.31558E+07	108.893	76.4967	75.7439	50.2436
.63116E+07	114.563	83.6886	82.9321	58.5892
.94673E+07	118.544	88.6760	87.9172	64.3357
.12623E+08	121.673	92.5740	91.8136	68.8123
.15779E+08	124.268	95.7944	95.0345	72.5041
.18935E+08	126.496	98.5489	97.7905	75.6584
.22090E+08	128.456	100.967	100.210	78.4248
.25246E+08	130.193	103.105	102.349	80.8716
.28402E+08	131.759	105.029	104.274	83.0759
.31558E+08	133.199	106.794	106.040	85.1000
.63115E+08	143.404	119.283	118.541	99.4275
.94673E+08	149.930	127.266	126.539	108.608
.12623E+09	155.059	133.540	132.827	115.822
.15779E+09	159.491	138.949	138.249	122.032
.18935E+09	163.201	143.489	142.802	127.251
.22090E+09	166.237	147.230	146.556	131.573

.25246E+09	168.918	150.546	149.883	135.409
.28402E+09	170.871	153.026	152.375	138.327
.31558E+09	172.445	155.068	154.428	140.759
.63115E+09	183.517	169.675	169.130	158.307
.94673E+09	190.526	179.048	178.576	169.636
.12623E+10	192.691	182.761	182.346	174.646
.15779E+10	192.924	184.120	183.751	176.951
.18935E+10	192.354	184.404	184.072	177.958
.22090E+10	191.272	183.981	183.677	178.092
.25246E+10	189.644	182.855	182.575	177.394
.28402E+10	188.159	181.773	181.511	176.652
.31558E+10	186.801	180.738	180.491	175.890
.63115E+10	180.039	175.207	175.018	171.393
.94673E+10	175.278	170.602	170.423	166.935
.12623E+11	172.790	168.181	168.007	164.578
.15779E+11	171.167	166.613	166.443	163.059
.18935E+11	169.310	164.789	164.621	161.268
.22090E+11	167.123	162.614	162.448	159.112
.25246E+11	164.739	160.230	160.067	156.739
.28402E+11	162.440	157.927	157.766	154.442
.31558E+11	160.352	155.835	155.676	152.355

 * Can. Outer Surface Temperature Prof. in Quad 1 WP Top - Bot *

VARIABLE 2 IS AT NODE 2682 ITEM= TEMP COMP= NAME= ot1oose

*** WARNING *** CP= 36829.220 TIME= 03:06:01
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 2673 ITEM= TEMP COMP= NAME= ot1oose

VARIABLE 4 IS AT NODE 1899 ITEM= TEMP COMP= NAME= it1oose

VARIABLE 5 IS AT NODE 1794 ITEM= TEMP COMP= NAME= it1oose

VARIABLE 6 IS AT NODE 1276 ITEM= TEMP COMP= NAME= st1oose

VARIABLE 7 IS AT NODE 1233 ITEM= TEMP COMP= NAME= st1oose

VARIABLE 8 IS AT NODE 1196 ITEM= TEMP COMP= NAME= ht1oose

VARIABLE 9 IS AT NODE 1197 ITEM= TEMP COMP= NAME= gt1oose

VARIABLE 10 IS AT NODE 58 ITEM= TEMP COMP= NAME= c01oose

VARIABLE 11 IS AT NODE 1019 ITEM= TEMP COMP= NAME= gb1oose

VARIABLE 12 IS AT NODE 1020 ITEM= TEMP COMP= NAME= gb1hose

VARIABLE 13 IS AT NODE 1018 ITEM= TEMP COMP= NAME= sb1oose

VARIABLE 14 IS AT NODE 1066 ITEM= TEMP COMP= NAME= sb1oose

VARIABLE 15 IS AT NODE 1529 ITEM= TEMP COMP= NAME= ib1oose

VARIABLE 16 IS AT NODE 1608 ITEM= TEMP COMP= NAME= ib1oose

VARIABLE 17 IS AT NODE 2682 ITEM= TEMP COMP= NAME= ob1oose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM AT TIME
2	NSOL	2682 TEMP	ot1oose	34.37	.1000E-05	178.5 .2209E+10
3	NSOL	2673 TEMP	ot1oose	34.46	.1000E-05	178.5 .2209E+10
4	NSOL	1899 TEMP	it1oose	35.97	31.56	178.9 .2209E+10

5	NSOL	1794	TEMP	it1oose	35.93	31.56	178.9	.2209E+10
6	NSOL	1276	TEMP	st1oose	42.80	31.56	179.7	.1893E+10
7	NSOL	1233	TEMP	st1oose	42.83	31.56	179.7	.1893E+10
8	NSOL	1196	TEMP	ht1oose	66.43	31.56	183.8	.1893E+10
9	NSOL	1197	TEMP	gt1oose	80.56	31.56	186.8	.1893E+10
10	NSOL	58	TEMP	co1oose	85.13	31.56	187.7	.1578E+10
11	NSOL	1019	TEMP	gb1oose	86.58	31.56	188.0	.1578E+10
12	NSOL	1020	TEMP	gb1hose	83.48	31.56	187.1	.1578E+10
13	NSOL	1018	TEMP	sb1oose	74.39	31.56	185.0	.1893E+10
14	NSOL	1066	TEMP	sb1oose	74.26	31.56	185.0	.1893E+10
15	NSOL	1529	TEMP	ib1oose	52.44	31.56	181.4	.1893E+10
16	NSOL	1608	TEMP	ib1oose	52.24	31.56	181.3	.1893E+10
17	NSOL	2682	TEMP	ob1oose	34.37	.1000E-05	178.5	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:05 OCT 29, 1995 CP= 36832.350
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2682 TEMP ot1oose	2673 TEMP ot1oose	1899 TEMP it1oose	1794 TEMP it1oose	1276 TEMP st1oose	1233 TEMP st1oose
.10000E-05	34.3737	34.4610	35.9682	35.9280	42.7974	42.8265
.20000E-05	34.3738	34.4611	35.9682	35.9281	42.7971	42.8262
.31558E+07	34.3737	34.4610	35.9682	35.9280	42.7970	42.8261
.31558E+07	52.7658	52.8461	54.2230	54.1882	59.9124	59.9361
.63116E+07	60.9653	61.0426	62.3649	62.3324	67.6139	67.6353
.94673E+07	66.6155	66.6908	67.9768	67.9459	72.9446	72.9646
.12623E+08	71.0189	71.0927	72.3508	72.3212	77.1106	77.1296
.15779E+08	74.6514	74.7240	75.9594	75.9308	80.5545	80.5725
.18935E+08	77.7559	77.8275	79.0436	79.0159	83.5025	83.5198
.22090E+08	80.4792	80.5499	81.7493	81.7223	86.0921	86.1087
.25246E+08	82.8883	82.9581	84.1428	84.1165	88.3852	88.4013
.28402E+08	85.0589	85.1280	86.2994	86.2737	90.4532	90.4688
.31558E+08	87.0524	87.1208	88.2801	88.2550	92.3543	92.3695
.63115E+08	101.173	101.237	102.309	102.288	105.851	105.863
.94673E+08	110.216	110.276	111.285	111.266	114.508	114.518
.12623E+09	117.326	117.383	118.342	118.325	121.328	121.337
.15779E+09	123.449	123.503	124.419	124.403	127.211	127.218
.18935E+09	128.595	128.648	129.527	129.513	132.160	132.167
.22090E+09	132.858	132.908	133.756	133.743	136.259	136.265
.25246E+09	136.641	136.690	137.510	137.498	139.899	139.904
.28402E+09	139.515	139.563	140.360	140.348	142.657	142.662
.31558E+09	141.910	141.956	142.732	142.720	144.951	144.955
.63115E+09	159.186	159.224	159.841	159.833	161.506	161.508
.94673E+09	170.346	170.377	170.888	170.883	172.219	172.220
.12623E+10	175.251	175.278	175.719	175.714	176.850	176.850
.15779E+10	177.483	177.507	177.896	177.893	178.889	178.889
.18935E+10	178.436	178.457	178.807	178.804	179.698	179.698
.22090E+10	178.528	178.547	178.867	178.864	179.681	179.681
.25246E+10	177.798	177.816	178.113	178.110	178.870	178.870
.28402E+10	177.032	177.049	177.327	177.324	178.039	178.039
.31558E+10	176.250	176.266	176.529	176.526	177.205	177.205
.63115E+10	171.679	171.692	171.899	171.897	172.439	172.440
.94673E+10	167.213	167.225	167.424	167.421	167.951	167.952
.12623E+11	164.852	164.864	165.059	165.057	165.582	165.582
.15779E+11	163.331	163.342	163.535	163.533	164.053	164.054
.18935E+11	161.538	161.549	161.740	161.738	162.256	162.257
.22090E+11	159.382	159.394	159.583	159.581	160.101	160.101
.25246E+11	157.009	157.021	157.210	157.207	157.730	157.731
.28402E+11	154.713	154.724	154.913	154.910	155.436	155.438
.31558E+11	152.628	152.639	152.827	152.825	153.354	153.355

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:05 OCT 29, 1995 CP= 36832.370
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1196 TEMP ht1iose	1197 TEMP gt1iose	58 TEMP c01iose	1019 TEMP gb1iose	1020 TEMP gb1iose	1018 TEMP sb1iose
.10000E-05	66.4324	80.5651	85.1333	86.5807	83.4802	74.3930
.20000E-05	66.4312	80.5634	85.1312	86.5785	83.4781	74.3912
31.558	66.4311	80.5633	85.1312	86.5785	83.4780	74.3910
.31558E+07	80.6385	93.4099	97.4945	98.7336	95.8618	87.5085
.63116E+07	87.1438	99.3267	103.203	104.356	101.589	93.5654
.94673E+07	91.6914	103.477	107.216	108.314	105.619	97.8199
.12623E+08	95.2628	106.743	110.377	111.433	108.794	101.170
.15779E+08	98.2257	109.456	113.004	114.026	111.434	103.954
.18935E+08	100.769	111.788	115.262	116.257	113.705	106.348
.22090E+08	103.007	113.842	117.253	118.223	115.707	108.458
.25246E+08	104.993	115.665	119.020	119.969	117.485	110.332
.28402E+08	106.786	117.312	120.617	121.547	119.092	112.026
.31558E+08	108.436	118.829	122.088	123.001	120.572	113.586
.63115E+08	120.197	129.638	132.573	133.372	131.141	124.728
.94673E+08	127.777	136.610	139.344	140.076	137.974	131.938
.12623E+09	133.770	142.126	144.702	145.383	143.385	137.648
.15779E+09	138.960	146.909	149.352	149.990	148.082	142.604
.18935E+09	143.333	150.937	153.268	153.872	152.041	146.782
.22090E+09	146.950	154.262	156.499	157.074	155.309	150.238
.25246E+09	150.163	157.216	159.368	159.919	158.212	153.309
.28402E+09	152.575	159.413	161.497	162.027	160.369	155.608
.31558E+09	154.566	161.215	163.239	163.752	162.137	157.500
.63115E+09	168.930	174.164	175.747	176.137	174.851	171.160
.94673E+09	178.254	182.559	183.856	184.170	183.104	180.048
.12623E+10	182.019	185.729	186.847	187.116	186.193	183.552
.15779E+10	183.448	186.732	187.723	187.960	187.140	184.799
.18935E+10	183.801	186.764	187.658	187.873	187.131	185.018
.22090E+10	183.438	186.155	186.977	187.174	186.492	184.553
.25246E+10	182.367	184.898	185.665	185.849	185.214	183.408
.28402E+10	181.329	183.711	184.434	184.608	184.009	182.310
.31558E+10	180.330	182.592	183.281	183.447	182.877	181.263
.63115E+10	174.938	176.748	177.303	177.438	176.980	175.691
.94673E+10	170.383	172.140	172.682	172.815	172.370	171.121
.12623E+11	167.986	169.722	170.258	170.390	169.951	168.718
.15779E+11	166.434	168.151	168.683	168.814	168.380	167.161
.18935E+11	164.627	166.334	166.864	166.995	166.563	165.352
.22090E+11	162.471	164.177	164.708	164.839	164.407	163.199
.25246E+11	160.109	161.818	162.351	162.484	162.051	160.842
.28402E+11	157.826	159.539	160.075	160.209	159.775	158.564
.31558E+11	155.752	157.470	158.008	158.144	157.709	156.496

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:05 OCT 29, 1995 CP= 36832.380
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1066 TEMP sb1iose	1529 TEMP ib1iose	1608 TEMP ib1iose	2682 TEMP ob1iose
.10000E-05	74.2584	52.4409	52.2414	34.3737
.20000E-05	74.2566	52.4402	52.2407	34.3738
31.558	74.2564	52.4400	52.2405	34.3737

.31558E+07	87.3767	68.4562	68.2576	52.7658
.63116E+07	93.4349	75.6946	75.4965	60.9653
.94673E+07	97.6907	80.7184	80.5206	66.6155
.12623E+08	101.042	84.6492	84.4516	71.0189
.15779E+08	103.827	87.9013	87.7040	74.6514
.18935E+08	106.222	90.6870	90.4900	77.7559
.22090E+08	108.333	93.1355	92.9388	80.4792
.25246E+08	110.207	95.3045	95.1085	82.8883
.28402E+08	111.901	97.2614	97.0661	85.0589
.31558E+08	113.462	99.0612	98.8665	87.0524
.63115E+08	124.609	111.853	111.665	101.173
.94673E+08	131.822	120.070	119.887	110.216
.12623E+09	137.536	126.550	126.371	117.326
.15779E+09	142.494	132.147	131.972	123.449
.18935E+09	146.676	136.857	136.686	128.595
.22090E+09	150.133	140.755	140.588	132.858
.25246E+09	153.207	144.217	144.053	136.641
.28402E+09	155.507	146.830	146.670	139.515
.31558E+09	157.401	148.997	148.839	141.910
.63115E+09	171.077	164.629	164.497	159.186
.94673E+09	179.977	174.756	174.642	170.346
.12623E+10	183.489	179.020	178.920	175.251
.15779E+10	184.744	180.801	180.712	177.483
.18935E+10	184.967	181.417	181.336	178.436
.22090E+10	184.507	181.253	181.179	178.528
.25246E+10	183.365	180.332	180.264	177.798
.28402E+10	182.270	179.413	179.349	177.032
.31558E+10	181.225	178.509	178.449	176.250
.63115E+10	175.661	173.479	173.432	171.679
.94673E+10	171.093	168.961	168.916	167.213
.12623E+11	168.691	166.579	166.536	164.852
.15779E+11	167.134	165.040	164.998	163.331
.18935E+11	165.326	163.238	163.196	161.538
.22090E+11	163.173	161.082	161.040	159.382
.25246E+11	160.816	158.713	158.672	157.009
.28402E+11	158.538	156.423	156.382	154.713
.31558E+11	156.470	154.343	154.303	152.628

 * Can. Inner Surface Temperature Prof. in Quad 4 WP Top - Bot *

VARIABLE 2 IS AT NODE 9867 ITEM= TEMP COMP= NAME= ot4oise

*** WARNING *** CP= 36832.590 TIME= 03:06:05
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 9830 ITEM= TEMP COMP= NAME= ot4iise

VARIABLE 4 IS AT NODE 9558 ITEM= TEMP COMP= NAME= it4oise

VARIABLE 5 IS AT NODE 9521 ITEM= TEMP COMP= NAME= it4iise

VARIABLE 6 IS AT NODE 8545 ITEM= TEMP COMP= NAME= st4oise

VARIABLE 7 IS AT NODE 8511 ITEM= TEMP COMP= NAME= st4iise

VARIABLE 8 IS AT NODE 8470 ITEM= TEMP COMP= NAME= ht4iise

VARIABLE 9 IS AT NODE 8471 ITEM= TEMP COMP= NAME= gt4iise

VARIABLE 10 IS AT NODE 7947 ITEM= TEMP COMP= NAME= c04iise

VARIABLE 11 IS AT NODE 7952 ITEM= TEMP COMP= NAME= gb4iise

VARIABLE 12 IS AT NODE 7953 ITEM= TEMP COMP= NAME= gb4hise

VARIABLE 13 IS AT NODE 7951 ITEM= TEMP COMP= NAME= sb4iise

VARIABLE 14 IS AT NODE 7996 ITEM= TEMP COMP= NAME= sb4oise
 VARIABLE 15 IS AT NODE 8946 ITEM= TEMP COMP= NAME= ib4iise
 VARIABLE 16 IS AT NODE 8983 ITEM= TEMP COMP= NAME= ib4oise
 VARIABLE 17 IS AT NODE 9867 ITEM= TEMP COMP= NAME= ob4oise

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	9867 TEMP	ot4oise	31.50	.1000E-05	178.1	.2209E+10
3 NSOL	9830 TEMP	ot4iise	31.53	.1000E-05	178.1	.2209E+10
4 NSOL	9558 TEMP	it4oise	49.81	31.56	182.1	.1893E+10
5 NSOL	9521 TEMP	it4iise	49.86	31.56	182.1	.1893E+10
6 NSOL	8545 TEMP	st4oise	56.35	31.56	183.3	.1893E+10
7 NSOL	8511 TEMP	st4iise	56.84	31.56	183.5	.1893E+10
8 NSOL	8470 TEMP	ht4iise	98.63	31.56	194.2	.1578E+10
9 NSOL	8471 TEMP	gt4iise	114.8	31.56	199.8	.1262E+10
10 NSOL	7947 TEMP	c04iise	122.6	.2000E-05	202.6	.1262E+10
11 NSOL	7952 TEMP	gb4iise	123.6	.2000E-05	202.8	.1262E+10
12 NSOL	7953 TEMP	gb4hise	115.9	.2000E-05	199.7	.1262E+10
13 NSOL	7951 TEMP	sb4iise	97.24	31.56	193.3	.1578E+10
14 NSOL	7996 TEMP	sb4oise	96.57	31.56	192.9	.1578E+10
15 NSOL	8946 TEMP	ib4iise	60.56	31.56	184.4	.1893E+10
16 NSOL	8983 TEMP	ib4oise	59.82	31.56	184.1	.1893E+10
17 NSOL	9867 TEMP	ob4oise	31.50	.1000E-05	178.1	.2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7(X) 03:06:08 OCT 29, 1995 CP= 36835.720
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9867 TEMP ot4oise	9830 TEMP ot4iise	9558 TEMP it4oise	9521 TEMP it4iise	8545 TEMP st4oise	8511 TEMP st4iise
.10000E-05	31.5025	31.5300	49.8125	49.8601	56.3507	56.8444
.20000E-05	31.5027	31.5302	49.8120	49.8596	56.3498	56.8435
31.558	31.5026	31.5301	49.8118	49.8594	56.3496	56.8433
.31558E+07	50.2476	50.2713	66.9614	67.0062	72.5657	73.0480
.63116E+07	58.5929	58.6150	74.6279	74.6716	79.8816	80.3594
.94673E+07	64.3393	64.3603	79.9204	79.9633	84.9516	85.4263
.12623E+08	68.8157	68.8360	84.0472	84.0894	88.9141	89.3862
.15779E+08	72.5073	72.5269	87.4525	87.4942	92.1888	92.6586
.18935E+08	75.6614	75.6806	90.3630	90.4042	94.9907	95.4583
.22090E+08	78.4277	78.4464	92.9163	92.9572	97.4496	97.9151
.25246E+08	80.8745	80.8928	95.1737	95.2142	99.6254	100.089
.28402E+08	83.0787	83.0966	97.2053	97.2454	101.586	102.048
.31558E+08	85.1028	85.1204	99.0701	99.1098	103.387	103.847
.63115E+08	99.4298	99.4453	112.251	112.288	116.136	116.582
.94673E+08	108.610	108.624	120.666	120.701	124.287	124.721
.12623E+09	115.824	115.837	127.273	127.307	130.694	131.119
.15779E+09	122.033	122.046	132.960	132.993	136.215	136.630
.18935E+09	127.252	127.264	137.734	137.766	140.850	141.256
.22090E+09	131.574	131.585	141.677	141.708	144.674	145.073
.25246E+09	135.411	135.421	145.172	145.202	148.064	148.455
.28402E+09	138.328	138.338	147.804	147.833	150.608	150.992
.31558E+09	140.760	140.770	149.980	150.009	152.709	153.086
.63115E+09	158.308	158.315	165.609	165.633	167.770	168.091
.94673E+09	169.636	169.642	175.667	175.686	177.452	177.730
.12623E+10	174.646	174.651	179.838	179.855	181.376	181.620
.15779E+10	176.952	176.956	181.535	181.550	182.893	183.110

.18935E+10	177.959	177.963	182.078	182.091	183.300	183.496
.22090E+10	178.092	178.096	181.854	181.866	182.972	183.150
.25246E+10	177.394	177.397	180.882	180.894	181.921	182.086
.28402E+10	176.653	176.656	179.923	179.933	180.898	181.052
.31558E+10	175.890	175.893	178.986	178.996	179.910	180.055
.63115E+10	171.394	171.396	173.829	173.837	174.560	174.672
.94673E+10	166.935	166.938	169.278	169.286	169.983	170.089
.12623E+11	164.578	164.580	166.881	166.889	167.574	167.677
.15779E+11	163.060	163.062	165.331	165.339	166.015	166.116
.18935E+11	161.268	161.270	163.519	163.526	164.197	164.296
.22090E+11	159.113	159.115	161.352	161.359	162.027	162.125
.25246E+11	156.739	156.741	158.972	158.979	159.647	159.743
.28402E+11	154.442	154.444	156.672	156.679	157.346	157.441
.31558E+11	152.356	152.358	154.582	154.589	155.256	155.351

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:08 OCT 29, 1995 CP= 36835.730
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8470 TEMP ht4iise	8471 TEMP gt4iise	7947 TEMP c04iise	7952 TEMP gb4iise	7953 TEMP gb4hise	7951 TEMP sb4iise
.10000E-05	98.6302	114.809	122.562	123.649	115.874	97.2472
.20000E-05	98.6280	114.807	122.560	123.647	115.872	97.2445
.31558E-05	98.6279	114.807	122.560	123.647	115.872	97.2444
.31558E+07	111.227	126.341	133.575	134.492	127.074	109.576
.63116E+07	116.981	131.626	138.634	139.481	132.231	115.245
.94673E+07	121.004	135.329	142.181	142.983	135.853	119.224
.12623E+08	124.159	138.234	144.965	145.734	138.700	122.352
.15779E+08	126.772	140.640	147.273	148.015	141.061	124.946
.18935E+08	129.012	142.703	149.250	149.970	143.086	127.172
.22090E+08	130.980	144.516	150.988	151.689	144.867	129.131
.25246E+08	132.723	146.120	152.527	153.211	146.445	130.867
.28402E+08	134.295	147.566	153.913	154.583	147.867	132.432
.31558E+08	135.739	148.895	155.187	155.843	149.173	133.871
.63115E+08	145.944	158.258	164.152	164.718	158.399	144.064
.94673E+08	152.437	164.185	169.808	170.321	164.254	150.579
.12623E+09	157.526	168.811	174.216	174.689	168.831	155.698
.15779E+09	161.916	172.794	178.006	178.447	172.777	160.121
.18935E+09	165.583	176.106	181.150	181.565	176.061	163.821
.22090E+09	168.576	178.790	183.686	184.080	178.724	166.847
.25246E+09	171.215	181.146	185.908	186.284	181.063	169.519
.28402E+09	173.129	182.818	187.466	187.827	182.724	171.463
.31558E+09	174.665	184.136	188.681	189.030	184.033	173.027
.63115E+09	185.402	193.158	196.894	197.158	193.018	184.017
.94673E+09	192.145	198.695	201.858	202.071	198.550	190.960
.12623E+10	194.112	199.834	202.603	202.787	199.700	193.073
.15779E+10	194.193	199.296	201.770	201.933	199.174	193.265
.18935E+10	193.504	198.129	200.374	200.523	198.018	192.661
.22090E+10	192.327	196.580	198.645	198.784	196.478	191.553
.25246E+10	190.625	194.589	196.515	196.646	194.496	189.903
.28402E+10	189.080	192.811	194.626	194.750	192.726	188.401
.31558E+10	187.674	191.218	192.942	193.062	191.138	187.029
.63115E+10	180.727	183.552	184.929	185.029	183.495	180.216
.94673E+10	175.934	178.657	179.985	180.085	178.609	175.444
.12623E+11	173.431	176.109	177.416	177.517	176.066	172.951
.15779E+11	171.797	174.441	175.731	175.831	174.400	171.325
.18935E+11	169.932	172.552	173.831	173.932	172.515	169.466
.22090E+11	167.738	170.345	171.618	171.720	170.310	167.275
.25246E+11	165.349	167.950	169.220	169.323	167.919	164.890
.28402E+11	163.045	165.642	166.910	167.016	165.614	162.589
.31558E+11	160.952	163.546	164.813	164.919	163.522	160.499

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:08 OCT 29, 1995 CP= 36835.740
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7996 TEMP sb4oise	8946 TEMP ib4iise	8983 TEMP ib4oise	9867 TEMP ob4oise
.10000E-05	96.5750	60.5638	59.8214	31.5025
.20000E-05	96.5724	60.5628	59.8203	31.5027
.31558E+07	96.5723	60.5625	59.8201	31.5026
.63116E+07	108.905	76.5078	75.7551	50.2476
.12623E+08	114.574	83.6991	82.9427	58.5929
.15779E+08	118.555	88.6862	87.9274	64.3393
.18935E+08	121.683	92.5839	91.8235	68.8157
.22090E+08	124.279	95.8040	95.0441	72.5073
.25246E+08	126.506	98.5584	97.7999	75.6614
.28402E+08	128.466	100.977	100.220	78.4277
.31558E+08	130.203	103.114	102.358	80.8745
.63115E+08	131.769	105.037	104.283	83.0787
.94673E+08	133.209	106.803	106.049	85.1028
.12623E+09	143.413	119.290	118.549	99.4298
.15779E+09	149.938	127.273	126.546	108.610
.18935E+09	155.067	133.547	132.834	115.824
.22090E+09	159.498	138.956	138.256	122.033
.25246E+09	163.208	143.495	142.808	127.252
.28402E+09	166.243	147.236	146.562	131.574
.31558E+09	168.924	150.551	149.889	135.411
.63115E+09	170.877	153.032	152.380	138.328
.94673E+09	172.451	155.073	154.433	140.760
.12623E+10	183.522	169.679	169.134	158.308
.15779E+10	190.530	179.051	178.579	169.636
.18935E+10	192.694	182.764	182.349	174.646
.22090E+10	192.927	184.122	183.753	176.952
.25246E+10	192.357	184.407	184.074	177.959
.28402E+10	191.275	183.983	183.679	178.092
.31558E+10	189.646	182.857	182.577	177.394
.63115E+10	188.161	181.775	181.513	176.653
.94673E+10	186.803	180.739	180.492	175.890
.12623E+11	180.041	175.209	175.019	171.394
.15779E+11	175.279	170.604	170.425	166.935
.18935E+11	172.791	168.183	168.009	164.578
.22090E+11	171.169	166.615	166.444	163.060
.25246E+11	169.312	164.790	164.622	161.268
.28402E+11	167.124	162.615	162.450	159.113
.31558E+11	164.741	160.232	160.069	156.739
	162.442	157.928	157.767	154.442
	160.354	155.837	155.677	152.356

 * Can. Outer Surface Temperature Prof. in Quad 4 WP Top - Bot *

VARIABLE 2 IS AT NODE 9786 ITEM= TEMP COMP= NAME= ot4oose

*** WARNING *** CP= 36835.950 TIME= 03:06:08
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 9777 ITEM= TEMP COMP= NAME= ot4iose

VARIABLE 4 IS AT NODE 9477 ITEM= TEMP COMP= NAME= it4oose

VARIABLE 5 IS AT NODE 9318 ITEM= TEMP COMP= NAME= it4iose

VARIABLE 6 IS AT NODE 8540 ITEM= TEMP COMP= NAME= st4oose
 VARIABLE 7 IS AT NODE 8497 ITEM= TEMP COMP= NAME= st4iose
 VARIABLE 8 IS AT NODE 8460 ITEM= TEMP COMP= NAME= ht4iose
 VARIABLE 9 IS AT NODE 8461 ITEM= TEMP COMP= NAME= gt4iose
 VARIABLE 10 IS AT NODE 7927 ITEM= TEMP COMP= NAME= c04iose
 VARIABLE 11 IS AT NODE 7929 ITEM= TEMP COMP= NAME= gb4iose
 VARIABLE 12 IS AT NODE 7930 ITEM= TEMP COMP= NAME= gb4hose
 VARIABLE 13 IS AT NODE 7928 ITEM= TEMP COMP= NAME= sb4iose
 VARIABLE 14 IS AT NODE 7991 ITEM= TEMP COMP= NAME= sb4oose
 VARIABLE 15 IS AT NODE 8787 ITEM= TEMP COMP= NAME= ib4iose
 VARIABLE 16 IS AT NODE 8902 ITEM= TEMP COMP= NAME= ib4oose
 VARIABLE 17 IS AT NODE 9786 ITEM= TEMP COMP= NAME= ob4oose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	9786 TEMP	ot4oose	34.40	.1000E-05	178.5	.2209E+10
3	NSOL	9777 TEMP	ot4iose	34.49	.1000E-05	178.6	.2209E+10
4	NSOL	9477 TEMP	it4oose	36.00	31.56	178.9	.2209E+10
5	NSOL	9318 TEMP	it4iose	35.96	31.56	178.9	.2209E+10
6	NSOL	8540 TEMP	st4oose	42.83	31.56	179.7	.1893E+10
7	NSOL	8497 TEMP	st4iose	42.86	31.56	179.7	.1893E+10
8	NSOL	8460 TEMP	ht4iose	66.48	31.56	183.8	.1893E+10
9	NSOL	8461 TEMP	gt4iose	80.62	31.56	186.8	.1893E+10
10	NSOL	7927 TEMP	c04iose	85.19	31.56	187.7	.1578E+10
11	NSOL	7929 TEMP	gb4iose	86.63	31.56	188.0	.1578E+10
12	NSOL	7930 TEMP	gb4hose	83.53	31.56	187.2	.1578E+10
13	NSOL	7928 TEMP	sb4iose	74.44	31.56	185.0	.1893E+10
14	NSOL	7991 TEMP	sb4oose	74.31	31.56	185.0	.1893E+10
15	NSOL	8787 TEMP	ib4iose	52.52	31.56	181.4	.1893E+10
16	NSOL	8902 TEMP	ib4oose	52.32	31.56	181.4	.1893E+10
17	NSOL	9786 TEMP	ob4oose	34.40	.1000E-05	178.5	.2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:11 OCT 29, 1995 CP= 36839.080
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9786 TEMP ot4oose	9777 TEMP ot4iose	9477 TEMP it4oose	9318 TEMP it4iose	8540 TEMP st4oose	8497 TEMP st4iose
.10000E-05	34.4047	34.4909	35.9988	35.9588	42.8309	42.8604
.20000E-05	34.4048	34.4910	35.9988	35.9588	42.8306	42.8601
31.558	34.4047	34.4909	35.9988	35.9587	42.8305	42.8600
.31558E+07	52.7922	52.8714	54.2490	54.2143	59.9422	59.9664
.63116E+07	60.9899	61.0661	62.3891	62.3567	67.6421	67.6640
.94673E+07	66.6389	66.7132	67.9997	67.9690	72.9718	72.9923
.12623E+08	71.0414	71.1142	72.3729	72.3434	77.1371	77.1564
.15779E+08	74.6732	74.7448	75.9808	75.9523	80.5802	80.5987
.18935E+08	77.7771	77.8477	79.0644	79.0368	83.5277	83.5455
.22090E+08	80.4999	80.5696	81.7695	81.7427	86.1168	86.1339

.25246E+08	82.9085	82.9774	84.1626	84.1364	88.4096	88.4261
.28402E+08	85.0788	85.1469	86.3188	86.2932	90.4772	90.4932
.31558E+08	87.0719	87.1394	88.2991	88.2741	92.3780	92.3935
.63115E+08	101.191	101.253	102.326	102.305	105.872	105.885
.94673E+08	110.232	110.291	111.300	111.281	114.528	114.538
.12623E+09	117.341	117.397	118.356	118.339	121.347	121.356
.15779E+09	123.462	123.516	124.432	124.417	127.228	127.236
.18935E+09	128.608	128.660	129.540	129.525	132.177	132.184
.22090E+09	132.870	132.920	133.768	133.755	136.275	136.281
.25246E+09	136.653	136.701	137.522	137.509	139.914	139.920
.28402E+09	139.527	139.574	140.371	140.359	142.672	142.677
.31558E+09	141.921	141.967	142.742	142.731	144.965	144.970
.63115E+09	159.195	159.231	159.849	159.841	161.517	161.520
.94673E+09	170.352	170.383	170.894	170.889	172.228	172.229
.12623E+10	175.257	175.283	175.724	175.720	176.857	176.858
.15779E+10	177.488	177.511	177.901	177.897	178.896	178.896
.18935E+10	178.440	178.461	178.811	178.808	179.704	179.704
.22090E+10	178.532	178.551	178.871	178.868	179.687	179.687
.25246E+10	177.802	177.820	178.116	178.114	178.875	178.876
.28402E+10	177.036	177.052	177.330	177.328	178.044	178.044
.31558E+10	176.253	176.269	176.532	176.530	177.209	177.210
.63115E+10	171.682	171.694	171.901	171.899	172.443	172.443
.94673E+10	167.215	167.227	167.426	167.424	167.955	167.955
.12623E+11	164.855	164.866	165.062	165.059	165.585	165.586
.15779E+11	163.333	163.345	163.537	163.535	164.056	164.057
.18935E+11	161.540	161.552	161.742	161.740	162.260	162.261
.22090E+11	159.385	159.396	159.586	159.583	160.104	160.105
.25246E+11	157.012	157.023	157.212	157.210	157.733	157.734
.28402E+11	154.715	154.727	154.915	154.913	155.440	155.441
.31558E+11	152.630	152.641	152.830	152.827	153.357	153.359

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:11 OCT 29, 1995 CP= 36839.090
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8460 TEMP ht4iose	8461 TEMP gt4iose	7927 TEMP c04iose	7929 TEMP gb4iose	7930 TEMP gb4hose	7928 TEMP sb4iose
.10000E-05	66.4849	80.6174	85.1874	86.6361	83.5349	74.4456
.20000E-05	66.4837	80.6157	85.1853	86.6339	83.5328	74.4438
31.558	66.4836	80.6156	85.1853	86.6338	83.5327	74.4437
.31558E+07	80.6879	93.4598	97.5463	98.7867	95.9142	87.5585
.63116E+07	87.1918	99.3754	103.253	104.408	101.641	93.6141
.94673E+07	91.7383	103.525	107.266	108.365	105.669	97.8677
.12623E+08	95.3089	106.790	110.426	111.483	108.844	101.217
.15779E+08	98.2711	109.503	113.052	114.076	111.483	104.001
.18935E+08	100.814	111.834	115.310	116.306	113.753	106.394
.22090E+08	103.051	113.887	117.300	118.272	115.755	108.504
.25246E+08	105.036	115.710	119.067	120.017	117.532	110.377
.28402E+08	106.829	117.357	120.664	121.595	119.139	112.070
.31558E+08	108.479	118.873	122.134	123.049	120.619	113.630
.63115E+08	120.236	129.679	132.616	133.417	131.184	124.770
.94673E+08	127.814	136.650	139.385	140.118	138.015	131.977
.12623E+09	133.806	142.164	144.741	145.423	143.425	137.686
.15779E+09	138.995	146.945	149.390	150.030	148.121	142.640
.18935E+09	143.366	150.972	153.305	153.910	152.078	146.817
.22090E+09	146.982	154.296	156.534	157.111	155.344	150.271
.25246E+09	150.194	157.249	159.403	159.954	158.247	153.342
.28402E+09	152.605	159.445	161.531	162.062	160.403	155.639
.31558E+09	154.595	161.246	163.272	163.786	162.170	157.531
.63115E+09	168.953	174.189	175.773	176.164	174.877	171.185
.94673E+09	178.273	182.580	183.878	184.192	183.126	180.069
.12623E+10	182.036	185.748	186.866	187.136	186.212	183.570

.15779E+10	183.463	186.749	187.740	187.978	187.158	184.815
.18935E+10	183.814	186.778	187.674	187.889	187.147	185.032
.22090E+10	183.450	186.168	186.991	187.188	186.507	184.567
.25246E+10	182.378	184.911	185.678	185.863	185.227	183.420
.28402E+10	181.340	183.723	184.447	184.621	184.022	182.321
.31558E+10	180.340	182.604	183.293	183.459	182.889	181.274
.63115E+10	174.946	176.757	177.312	177.447	176.990	175.699
.94673E+10	170.391	172.149	172.691	172.824	172.379	171.129
.12623E+11	167.994	169.730	170.267	170.399	169.960	168.727
.15779E+11	166.442	168.160	168.692	168.823	168.388	167.169
.18935E+11	164.634	166.343	166.873	167.004	166.572	165.360
.22090E+11	162.479	164.185	164.716	164.848	164.416	163.207
.25246E+11	160.116	161.826	162.359	162.493	162.059	160.850
.28402E+11	157.833	159.548	160.084	160.218	159.784	158.572
.31558E+11	155.760	157.479	158.017	158.153	157.717	156.504

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:11 OCT 29, 1995 CP= 36839.100
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7991 TEMP sb4oose	8787 TEMP ib4iose	8902 TEMP ib4oose	9786 TEMP ob4oose
.10000E-05	74.3109	52.5175	52.3181	34.4047
.20000E-05	74.3090	52.5167	52.3173	34.4048
31.558	74.3089	52.5165	52.3171	34.4047
.31558E+07	87.4266	68.5258	68.3274	52.7922
.63116E+07	93.4835	75.7612	75.5633	60.9899
.94673E+07	97.7384	80.7830	80.5854	66.6389
.12623E+08	101.089	84.7122	84.5149	71.0414
.15779E+08	103.873	87.9630	87.7660	74.6732
.18935E+08	106.268	90.7477	90.5510	77.7771
.22090E+08	108.378	93.1952	92.9988	80.4999
.25246E+08	110.252	95.3634	95.1677	82.9085
.28402E+08	111.946	97.3195	97.1245	85.0788
.31558E+08	113.506	99.1187	98.9243	87.0719
.63115E+08	124.650	111.906	111.717	101.191
.94673E+08	131.861	120.119	119.936	110.232
.12623E+09	137.573	126.596	126.418	117.341
.15779E+09	142.530	132.191	132.016	123.462
.18935E+09	146.710	136.899	136.729	128.608
.22090E+09	150.166	140.795	140.629	132.870
.25246E+09	153.239	144.256	144.093	136.653
.28402E+09	155.538	146.868	146.708	139.527
.31558E+09	157.432	149.034	148.876	141.921
.63115E+09	171.101	164.658	164.526	159.195
.94673E+09	179.997	174.780	174.666	170.352
.12623E+10	183.507	179.041	178.941	175.257
.15779E+10	184.759	180.819	180.730	177.488
.18935E+10	184.982	181.433	181.352	178.440
.22090E+10	184.520	181.268	181.194	178.532
.25246E+10	183.377	180.346	180.278	177.802
.28402E+10	182.281	179.426	179.362	177.036
.31558E+10	181.236	178.521	178.461	176.253
.63115E+10	175.670	173.488	173.442	171.682
.94673E+10	171.101	168.970	168.926	167.215
.12623E+11	168.699	166.589	166.545	164.855
.15779E+11	167.142	165.049	165.007	163.333
.18935E+11	165.334	163.247	163.205	161.540
.22090E+11	163.181	161.091	161.049	159.385
.25246E+11	160.824	158.722	158.681	157.012
.28402E+11	158.546	156.432	156.391	154.715
.31558E+11	156.478	154.352	154.312	152.630

 * WP Outer Surface Temperature Prof. at 90 deg. WP Top - Bot *

VARIABLE 2 IS AT NODE 2874 ITEM= TEMP COMP= NAME= otwoose

*** WARNING *** CP= 36839.310 TIME= 03:06:12
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 2610 ITEM= TEMP COMP= NAME= otwiose

VARIABLE 4 IS AT NODE 2556 ITEM= TEMP COMP= NAME= itwoose

VARIABLE 5 IS AT NODE 2504 ITEM= TEMP COMP= NAME= itwiose

VARIABLE 6 IS AT NODE 563 ITEM= TEMP COMP= NAME= stwoose

VARIABLE 7 IS AT NODE 2186 ITEM= TEMP COMP= NAME= stwiose

VARIABLE 8 IS AT NODE 2150 ITEM= TEMP COMP= NAME= htwoose

VARIABLE 9 IS AT NODE 2151 ITEM= TEMP COMP= NAME= gtwoose

VARIABLE 10 IS AT NODE 126 ITEM= TEMP COMP= NAME= c0wiose

VARIABLE 11 IS AT NODE 2085 ITEM= TEMP COMP= NAME= gbwiose

VARIABLE 12 IS AT NODE 2086 ITEM= TEMP COMP= NAME= gbwoose

VARIABLE 13 IS AT NODE 2084 ITEM= TEMP COMP= NAME= sbwiose

VARIABLE 14 IS AT NODE 660 ITEM= TEMP COMP= NAME= sbwoose

VARIABLE 15 IS AT NODE 2236 ITEM= TEMP COMP= NAME= ibwiose

VARIABLE 16 IS AT NODE 2272 ITEM= TEMP COMP= NAME= ibwoose

VARIABLE 17 IS AT NODE 2874 ITEM= TEMP COMP= NAME= obwoose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM AT TIME
2	NSOL	2874 TEMP	otwoose	34.85	.1000E-05	178.6 .2209E+10
3	NSOL	2610 TEMP	otwiose	35.21	31.56	178.7 .2209E+10
4	NSOL	2556 TEMP	itwoose	35.57	31.56	178.8 .2209E+10
5	NSOL	2504 TEMP	itwiose	35.88	31.56	178.9 .2209E+10
6	NSOL	563 TEMP	stwoose	38.81	31.56	179.4 .2209E+10
7	NSOL	2186 TEMP	stwiose	39.09	31.56	179.4 .2209E+10
8	NSOL	2150 TEMP	htwoose	48.01	31.56	181.1 .1893E+10
9	NSOL	2151 TEMP	gtwoose	53.09	31.56	182.1 .1893E+10
10	NSOL	126 TEMP	c0wiose	56.44	31.56	182.7 .1893E+10
11	NSOL	2085 TEMP	gbwiose	57.52	31.56	182.8 .1893E+10
12	NSOL	2086 TEMP	gbwoose	55.68	31.56	182.3 .1893E+10
13	NSOL	2084 TEMP	sbwiose	52.67	31.56	181.6 .1893E+10
14	NSOL	660 TEMP	sbwoose	52.55	31.56	181.5 .1893E+10
15	NSOL	2236 TEMP	ibwiose	52.35	31.56	181.4 .1893E+10
16	NSOL	2272 TEMP	ibwoose	52.18	31.56	181.4 .1893E+10
17	NSOL	2874 TEMP	obwoose	34.85	.1000E-05	178.6 .2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:15 OCT 29, 1995 CP= 36842.520
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2874 TEMP otwoose	2610 TEMP otwoose	2556 TEMP itwoose	2504 TEMP itwoose	563 TEMP stwoose	2186 TEMP stwoose
.10000E-05	34.8503	35.2124	35.5711	35.8806	38.8143	39.0888
.20000E-05	34.8504	35.2125	35.5711	35.8806	38.8143	39.0888
31.558	34.8503	35.2124	35.5711	35.8805	38.8142	39.0887
.31558E+07	53.2106	53.5439	53.8727	54.1555	56.7718	57.0175
.63116E+07	61.3960	61.7172	62.0335	62.3051	64.7902	65.0240
.94673E+07	67.0366	67.3497	67.6576	67.9219	70.3204	70.5463
.12623E+08	71.4324	71.7393	72.0409	72.2995	74.6320	74.8519
.15779E+08	75.0586	75.3605	75.6569	75.9109	78.1899	78.4049
.18935E+08	78.1577	78.4553	78.7472	78.9973	81.2313	81.4421
.22090E+08	80.8762	81.1700	81.4581	81.7048	83.8996	84.1069
.25246E+08	83.2810	83.5715	83.8562	84.0998	86.2603	86.4644
.28402E+08	85.4477	85.7352	86.0168	86.2578	88.3875	88.5888
.31558E+08	87.4376	87.7223	88.0011	88.2396	90.3413	90.5400
.63115E+08	101.532	101.797	102.056	102.276	104.180	104.360
.94673E+08	110.554	110.804	111.048	111.255	113.029	113.197
.12623E+09	117.648	117.886	118.117	118.315	119.988	120.146
.15779E+09	123.756	123.984	124.205	124.394	125.981	126.132
.18935E+09	128.891	129.110	129.323	129.504	131.019	131.163
.22090E+09	133.143	133.354	133.559	133.734	135.189	135.328
.25246E+09	136.917	137.121	137.320	137.489	138.890	139.023
.28402E+09	139.783	139.982	140.175	140.339	141.696	141.825
.31558E+09	142.170	142.364	142.552	142.712	144.029	144.155
.63115E+09	159.393	159.548	159.698	159.825	160.853	160.951
.94673E+09	170.517	170.645	170.770	170.875	171.717	171.797
.12623E+10	175.398	175.509	175.617	175.708	176.429	176.499
.15779E+10	177.613	177.711	177.806	177.886	178.523	178.584
.18935E+10	178.552	178.640	178.726	178.798	179.370	179.425
.22090E+10	178.634	178.715	178.792	178.859	179.381	179.431
.25246E+10	177.897	177.972	178.044	178.105	178.590	178.637
.28402E+10	177.125	177.195	177.262	177.320	177.775	177.819
.31558E+10	176.337	176.404	176.468	176.522	176.953	176.995
.63115E+10	171.748	171.800	171.851	171.893	172.235	172.267
.94673E+10	167.279	167.329	167.377	167.418	167.748	167.780
.12623E+11	164.917	164.966	165.014	165.054	165.379	165.410
.15779E+11	163.395	163.443	163.490	163.530	163.851	163.882
.18935E+11	161.601	161.649	161.695	161.735	162.053	162.084
.22090E+11	159.445	159.493	159.539	159.578	159.896	159.926
.25246E+11	157.072	157.120	157.166	157.205	157.522	157.553
.28402E+11	154.776	154.823	154.869	154.908	155.226	155.256
.31558E+11	152.690	152.738	152.783	152.822	153.140	153.171

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:15 OCT 29, 1995 CP= 36842.530
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2150 TEMP htwoose	2151 TEMP gtwoose	126 TEMP cwoose	2085 TEMP gbwoose	2086 TEMP gbwoose	2084 TEMP sbwoose
.10000E-05	48.0146	53.0862	56.4416	57.5191	55.6803	52.6734
.20000E-05	48.0142	53.0855	56.4406	57.5181	55.6794	52.6727
31.558	48.0140	53.0853	56.4404	57.5178	55.6791	52.6725
.31558E+07	64.9611	69.4832	72.4470	73.3017	71.5467	68.7225
.63116E+07	72.5587	76.8519	79.6547	80.4246	78.7137	75.9746
.94673E+07	77.8109	81.9531	84.6506	85.3671	83.6880	81.0074
.12623E+08	81.9103	85.9373	88.5549	89.2322	87.5790	84.9448
.15779E+08	85.2958	89.2292	91.7822	92.4286	90.7976	88.2022
.18935E+08	88.1915	92.0458	94.5446	95.1655	93.5540	90.9921

.22090E+08	90.7333	94.5192	96.9706	97.5699	95.9760	93.4442
.25246E+08	92.9831	96.7083	99.1183	99.6991	98.1212	95.6164
.28402E+08	95.0109	98.6816	101.055	101.619	100.056	97.5759
.31558E+08	96.8738	100.496	102.832	103.382	101.835	99.3782
.63115E+08	110.064	113.327	115.423	115.882	114.447	112.177
.94673E+08	118.501	121.541	123.491	123.899	122.541	120.395
.12623E+09	125.140	128.007	129.844	130.216	128.919	126.874
.15779E+09	130.865	133.586	135.327	135.669	134.427	132.469
.18935E+09	135.677	138.275	139.937	140.255	139.060	137.176
.22090E+09	139.656	142.151	143.746	144.045	142.890	141.071
.25246E+09	143.188	145.591	147.125	147.409	146.290	144.530
.28402E+09	145.855	148.182	149.667	149.938	148.851	147.139
.31558E+09	148.066	150.326	151.768	152.028	150.969	149.301
.63115E+09	163.993	165.759	166.884	167.070	166.224	164.894
.94673E+09	174.280	175.726	176.646	176.791	176.090	174.986
.12623E+10	178.627	179.869	180.659	180.781	180.175	179.222
.15779E+10	180.460	181.556	182.253	182.360	181.824	180.981
.18935E+10	181.112	182.097	182.724	182.820	182.337	181.578
.22090E+10	180.973	181.875	182.449	182.536	182.095	181.400
.25246E+10	180.070	180.907	181.441	181.523	181.113	180.468
.28402E+10	179.164	179.951	180.453	180.530	180.145	179.540
.31558E+10	178.271	179.017	179.493	179.567	179.202	178.628
.63115E+10	173.280	173.873	174.251	174.312	174.023	173.569
.94673E+10	168.761	169.334	169.701	169.761	169.483	169.046
.12623E+11	166.378	166.943	167.305	167.365	167.091	166.662
.15779E+11	164.838	165.397	165.755	165.814	165.545	165.121
.18935E+11	163.034	163.590	163.945	164.005	163.737	163.317
.22090E+11	160.875	161.429	161.783	161.843	161.577	161.159
.25246E+11	158.502	159.056	159.411	159.472	159.206	158.789
.28402E+11	156.207	156.762	157.118	157.180	156.914	156.497
.31558E+11	154.123	154.679	155.035	155.098	154.833	154.416

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 03:06:15 OCT 29, 1995 CP= 36842.540
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	660 TEMP sbwoose	2236 TEMP ibwoose	2272 TEMP ibwoose	2874 TEMP obwoose
.10000E-05	52.5478	52.3492	52.1786	34.8503
.20000E-05	52.5471	52.3485	52.1779	34.8504
31.558	52.5469	52.3483	52.1777	34.8503
.31558E+07	68.5969	68.3984	68.2277	53.2106
.63116E+07	75.8491	75.6508	75.4803	61.3960
.94673E+07	80.8821	80.6839	80.5135	67.0366
.12623E+08	84.8196	84.6217	84.4514	71.4324
.15779E+08	88.0771	87.8794	87.7093	75.0586
.18935E+08	90.8672	90.6698	90.4999	78.1577
.22090E+08	93.3194	93.1223	92.9527	80.8762
.25246E+08	95.4918	95.2950	95.1256	83.2810
.28402E+08	97.4516	97.2552	97.0861	85.4477
.31558E+08	99.2540	99.0579	98.8891	87.4376
.63115E+08	112.057	111.868	111.705	101.532
.94673E+08	120.279	120.095	119.936	110.554
.12623E+09	126.761	126.581	126.427	117.648
.15779E+09	132.358	132.183	132.033	123.756
.18935E+09	137.068	136.897	136.750	128.891
.22090E+09	140.965	140.798	140.654	133.143
.25246E+09	144.426	144.263	144.122	136.917
.28402E+09	147.037	146.877	146.739	139.783
.31558E+09	149.202	149.044	148.909	142.170
.63115E+09	164.810	164.678	164.564	159.393
.94673E+09	174.914	174.801	174.704	170.517
.12623E+10	179.159	179.061	178.975	175.398

.15779E+10	180.925	180.837	180.761	177.613
.18935E+10	181.528	181.448	181.380	178.552
.22090E+10	181.354	181.282	181.219	178.634
.25246E+10	180.425	180.358	180.300	177.897
.28402E+10	179.500	179.437	179.383	177.125
.31558E+10	178.591	178.531	178.480	176.337
.63115E+10	173.540	173.494	173.454	171.748
.94673E+10	169.018	168.974	168.936	167.279
.12623E+11	166.634	166.592	166.555	164.917
.15779E+11	165.094	165.052	165.016	163.395
.18935E+11	163.291	163.249	163.214	161.601
.22090E+11	161.133	161.092	161.057	159.445
.25246E+11	158.763	158.723	158.688	157.072
.28402E+11	156.472	156.432	156.397	154.776
.31558E+11	154.391	154.351	154.317	152.690

***** ROUTINE COMPLETED ***** CP = 36842.550

 End of batch input file

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= glsp21x2.db
 FOR POSSIBLE RESUME FROM THIS POINT

PURGE ALL SOLUTION AND POST DATA
 SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= glsp21x2.db
 FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 112
 NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

*** PAGE FILE USED ***
 NUMBER OF R/W OPERATIONS= 30529
 MAXIMUM RECORD NUMBER = 427
 RECORD SIZE (I*4 WORDS) = 16384
 PAGE FILE SIZE (MB) = 26.688

```

*-----*
|                                     |
|               ANSYS RUN COMPLETED               |
|-----|
|               REV. 5.0 A               |               HP 9000/7XX               |
|               CP TIME (sec) = 36867.180           TIME = 03:07:08           |
|               ELAPSED TIME (sec) = 58933.000       DATE = 10/29/95           |
|-----|
*-----*
  
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*-----*
| WELCOME TO THE ANSYS PROGRAM |
*-----*

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***** ANSYS COMMAND LINE ARGUMENTS *****
JOB NAME           = pugls2x
MEMORY REQUESTED (MB) = 87.0
BATCH MODE REQUESTED
start.ans FILE

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***** ANSYS DYNAMIC MEMORY ALLOCATION *****
WORK SPACE REQUESTED      = 22806528      87.000 MB  COMMAND LINE
MINIMUM WORK SPACE REQUIRED = 4718592       18.000 MB
MINIMUM WORK SPACE RECOMMENDED = 6702496    25.568 MB
WORK SPACE OBTAINED       = 22806526      87.000 MB
BYTES PER WORD            = 4

```

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ERRORS ENCOUNTERED IN EITHER THE DOCUMENTATION OR THE
RESULTS SHOULD BE IMMEDIATELY BROUGHT TO OUR ATTENTION.

```

ENTER /SHOW,device TO SET THE GRAPHICS DISPLAY TO device(e.g. X11,4207,ETC.)
ENTER /MENU,ON     TO START THE ANSYS MENU SYSTEM
ENTER HELP        FOR GENERAL ANSYS HELP INFORMATION
1 /COM, *****
2 /COM, ANSYS REVISION 5.0A                                06/09/1995
3 /COM, 3-D Model of Pu Disp. Glass WP for MGDS Disposal Thomas L Lotz
4 /COM, *****
5 /COM, *
6 /COM, * File name: pugls2x.inp
7 /COM, * 4 Pack Glass WP Form w/ C71500 Outer Barrier D. Container
8 /COM, * No Helium Fill Gas - WP placed at mid point between SNF WP
9 /COM, *
10 /COM, * Material Property file: propsd1.dat
11 /COM, *
12 /COM, * SNF Conductivity file: TBD (NOT REQUIRED)
13 /COM, *
14 /COM, *
15 /COM, * SNF Heat Loads file: pusgls3.dat
16 /COM, * Initial Heat Load: 681 W/canister
17 /COM, *
18 /COM, * Surface Temp. file: c21x5a.parm

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19 /COM, *      100 MTU/acre (24.7 kgU/m^2) AML (High Thermal Loading) *
20 /COM, *      5.0 m Diameter Drift with Concrete Invert *
21 /COM, *      Drift spacing = 22.5 m *
22 /COM, *      WP c/c spacing = 16.165 m *
23 /COM, *
24 /COM, *****
25 /COM, Increase the number of database pages from 16 (256) to 32 Mb
26 /COM, DONT DO: /CONFIG,nvpag,512,
27 /COM, Work space must also be increased (-m 87) For Radiation Matix
28 /COM, *****
29 /TITLE, DHLW Glass Form Waste Package
30 /UNITS,S1,
31 /COM,
32 /COM, *****
33 /COM, Read in average effective conductivities from SNF model
34 /COM, No Need for File: PARRES,CHANGE,pwr15e,parm,
35 /COM, Read in surface temps. from repository model
36 /COM, PARRES,CHANGE,c21x5a,parm,
37 /COM, *****
38 /COM, Define Transient time parameters (AS PER THE PARAM FILE)
39 /COM, TM_START = start time (sec)
40 /COM, TMI* = time increment for solution (sec)
41 /COM, TME* = start and stop for time do-loops (sec)
42 /COM, Note: 1 year = 3.15576e7 seconds
43 /COM, TMTMAX = time of maximum cladding temperature
44 /COM, TM_START=(1.0E-6)*(3.15576E7)
45 /COM, TMI0=0.1*3.15576E7
46 /COM, TMI1=1.0*3.15576E7
47 /COM, TMI10=10.0*3.15576E7
48 /COM, TMI100=100.0*3.15576E7
49 /COM, TMI1000=1000.0*3.15576E7
50 /COM, TME0=0.9*3.15576E7+TM_START
51 /COM, TME1=TMI1+TM_START
52 /COM, TME9=9.0*3.15576E7+TM_START
53 /COM, TME10=TMI10+TM_START
54 /COM, TME50=50.0*3.15576E7+TM_START
55 /COM, TME90=90.0*3.15576E7+TM_START
56 /COM, TME100=TMI100+TM_START
57 /COM, TME1000=TMI1000+TM_START
58 /COM, *****
59 /COM, Define waste package parameters
60 /COM,
61 /COM, Required Constants:
62 /COM,
63 /COM, PI=3.141592654
64 /COM, SQT= SQRT(2.0)
65 /COM, Define emplacement parameters
66 /COM, DFRAD = radius of drift (m)
67 /COM, INVRT = height of invert backfill floor (m)
68 /COM, WPSPC = waste package c/c spacing (m)
69 /COM, OFFST = WP center below drift center (m)
70 /COM, XXX = X coordinate of invert drift wall intersection
71 /COM, YYY = Y coordinate of invert drift wall intersection
72 /COM, *SET,DFRAD,2.5,
73 /COM, *SET,INVRT,0.7,
74 /COM, *SET,WPSPC,16.165,
75 /COM, *SET,OFFST,0.1833,
76 /COM, XXX=SQRT(DFRAD**2-(DFRAD-INVRT)**2)
77 /COM, YYY=OFFST-DFRAD+INVRT
78 /COM,
79 /COM, Required container wall parameters:
80 /COM, DCIRD = disposal container inner radius (m)
81 /COM, OWALL = outer barrier thickness (m)
82 /COM, IWALL = inner barrier thickness (m)
83 /COM, DCORD = disposal container outer radius (m)
84 /COM, DCLEN = Disp. Cont. outside length
85 /COM, DCOLT = Disp. Cont. Outer Lid Thickness (m)
86 /COM, DCILT = Disp. Cont. Inner Lid Thickness (m)
87 /COM, DCIOG = Disp. Cont. Inner/Outer Lid Gap at top of WP (m)
88 /COM, DCILM = Disp. Cont. Inner Bar. Total length (m)

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89 /COM,          DCILI = Disp. Cont. Inner Bar. Inner length (m)
90 DCIRD=1569.0/1000.0/2.0
91 OWALL=0.0500
92 IWALL=0.0200
93 DCORD=DCIRD+IWALL+OWALL
94 DCLEN=3230.0/1000.0
95 DCOLT=55.0/1000.0
96 DCILT=25.0/1000.0
97 DCIOG=30.0/1000.0
98 DCILN=DCLEN-(2.0*DCOLT)-DCIOG
99 DCILI=3040.0/1000.0
100 /COM,
101 /COM,          Required ceramic and drum parameters:
102 /COM,          CDRAD = glass radius (m)
103 /COM,          CDHGT = glass hieght; hieght of fill (m)
104 /COM,          DRMIR = SRP Canister inner rad. (m)
105 /COM,          DRMOR = SRP Canister drum outer rad. (m)
106 /COM,          DRBTT = SRP Canister thickness at bottom of Canister (m)
107 /COM,          DRTPT = SRP Canister thickness at Top of Canister (m)
108 /COM,          DRLEN = SRP Canister outer length (m)
109 /COM,          DRILN = SRP Canister Inner length (m)
110 /COM,          DRGAP = SRP Canister axial gap with inner barrier at bot
111 /COM,          DRGPT = SRP Canister axial gap with inner barrier at top
112 /COM,          DRMOF = SRP Canister center line off set (m)
113 /COM,          PEAKF = Peaking factor to adjust Heat generation dist.
114 /COM,          FVOLU = can_volume=PI*glass_fill_radiu^2*glass_length
115 CDRAD=((60.96/2.0)-0.95)/100.0
116 CDHGT=2.1549
117 DRMIR=CDRAD
118 DRMOR=60.96/100.0/2.0
119 DRBTT=15.0/1000.0
120 DRTPT=20.0/1000.0
121 DRLEN=2744.6/1000.0
122 DRILN=DRLEN-DRBTT-DRTPT
123 DRGAP=25.0/1000.0
124 DRGPT=DCILI-DRLEN-DRGAP
125 DRMOF=(DCIRD-(DRMOR*(SQT+1)))/(SQT+1)
126 PEAKF=1.00
127 FVOLU=PI*CDRAD*CDRAD*CDHGT
128 /COM,
129 /COM,          Define Extrude Distances as required:
130 /COM,          Bottom of WP
131 MIDPT=DCLEN/2.0
132 BTPT1=MIDPT-DCOLT
133 BTPT2=BTPT1-DCILT
134 BTPT3=BTPT2-DRGAP
135 BTPT4=BTPT3-DRBTT
136 /COM,          Top of WP
137 TPPT1=MIDPT-DCOLT
138 TPPT2=TPPT1-DCIOG
139 TPPT3=TPPT2-DCILT
140 TPPT4=TPPT3-(DCILI-DRGAP-DRLEN)
141 TPPT5=TPPT4-DRTPT
142 TPPT6=CDHGT-BTPT4
143 /COM,
144 /COM,
145 /COM,          *****
146 /COM,          Define calculated parameters
147 /COM,          ASSY = assembly heat production (W) f(yrs)
148 /COM,          FUEL = volumetric heat production (W/m3) f(yrs)
149 *SET,ASSY,
150 *DIM,ASSY, TABLE,101,1,
151 *DIM,FUEL, TABLE,101,1
152 /COM,
153 /COM,          *****
154 /COM,          Define 45 degree point of reference:
155 /COM,          TCO45 = x coord. WP Center Line Outer Pour Can. at 45 de
156 /COM,          TCI45 = x coord. WP Center Line Inner Pour Can. at 45 de
157 /COM,          HCI45 = x coord. WP Center Line side of center Glass at
158 /COM,          HCO45 = x coord. WP Edge side of center Glass at 45 deg.

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159 /COM,          CCO45 = x coord. Glass Center Line in Pour Can. at 45 de
160 /COM,          SCO45 = x coord. WP Edge Outer Pour Can. at 45 deg.
161 /COM,          SCI45 = x coord. WP Edge Inner Pour Can. at 45 deg.
162 /COM,          MI45 = x coord. DCIRD at 45 deg.
163 /COM,          MO45 = x coord. DCIRD+IWALL at 45 deg.
164 /COM,          DO45 = x coord. DCIRD+IWALL+OWALL at 45 deg.
165 TCO45=(DRMOF+DRMOR-DRMOR/SQT)
166 TC145=(DRMOF+DRMOR-DRMIR/SQT)
167 HCI45=(DRMOF+DRMOR-(0.5*DRMIR)/SQT)
168 HCO45=(DRMOF+DRMOR+(0.5*DRMIR)/SQT)
169 CCO45=(DRMOF+DRMOR)
170 SCO45=(DRMOF+DRMOR+DRMOR/SQT)
171 SCI45=(DRMOF+DRMOR+DRMIR/SQT)
172 MI45=DCIRD/SQT
173 MO45=(DCIRD+IWALL)/SQT
174 DO45=(DCIRD+IWALL+OWALL)/SQT
175 /COM,
176 /COM,          *****
177 /COM,          Define different element types
178 /PREP7
179 ETYPE
180 ET, 1,55,
181 ET, 2,70,
182 ET, 6,57,
183 ET, 7,32,
184 ET, 11,57,
185 ET, 16,57,
186 ET, 17,32,
187 ET, 18,50,1,
188 ET, 19,31,
189 ET, 26,57,
190 ET, 27,32,
191 ET, 36,57,
192 ET, 46,57,
193 /COM,          *****
194 /COM,          File props01.dat describes material properties
195 /COM,          and thier reference numbers
196 MPREAD,propsd1,dat,
197 /COM,          *****
198 /COM,          Define new material 15 for low thermal loading
199 /COM,          outer barrier of 70/30 Copper Nickel (C71500)
200 /COM,          Density:      DENS      (kg/m^3)
201 /COM,          Emissivity :  EMIS
202 /COM,          Conductivity: KXX      (W/m/K)
203 /COM,          Specific Heat: C      (J/kg/K)
204 MPTEMP
205 MPTEMP, 1, .00000E+00,
206 /COM,          Density (lb/in^3 converted to kg/m^3)
207 MPDATA,DENS,15, 1,(0.323*2.768E+04),
208 /COM,          Emissivity
209 MPDATA,EMIS,15, 1, 0.40000E+00,
210 /COM,          Specific Heat (Btu/lb/F converted to J/kg/K)
211 MPDATA, C,15, 1,(0.09/2.3886E-04),
212 /COM,          Conductivity (Btu/hr/ft/F converted to W/m/K)
213 MPTEMP
214 MPTEMP, 1, (5.0/9.0*(68.0-32.0)), (5.0/9.0*(212.0-32.0)),
215 MPTEMP, 3, (5.0/9.0*(392.0-32.0)), (5.0/9.0*(572.0-32.0)),
216 MPTEMP, 5, (5.0/9.0*(752.0-32.0)), (5.0/9.0*(932.0-32.0)),
217 MPTEMP, 7,(5.0/9.0*(1112.0-32.0)),(5.0/9.0*(1292.0-32.0)),
218 MPDATA, KXX,15, 1, (17.0*1.7307), (16.9*1.7307),
219 MPDATA, KXX,15, 3, (19.7*1.7307), (22.3*1.7307),
220 MPDATA, KXX,15, 5, (24.9*1.7307), (27.8*1.7307),
221 MPDATA, KXX,15, 7, (30.7*1.7307), (33.6*1.7307),
222 /COM,          *****
223 /COM,          Read in single drum heat loads
224 /COM,          Calculate the volumetric heat generation
225 /COM,          (Assembly time is in years, FUEL is in seconds)
226 /INPUT,pugls3,dat
227 *VFACT,3.15576E7,
228 *MFUN,FUEL(1,0),COPY,ASSY(1,0),

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229 *VFACT,(PEAKF/FVOLUME),
230 *VFUN,FUEL(1),COPY,ASSY(1),
231 FUEL(0,1)=1.0
232 /COM, *****
233 /COM,      Define LOCAL Coordinate system for canister orientation
234 /COM,      if use CSYS,0, the P. Cans are 2x2,
235 /COM,      if use CSYS,15, the P. Cans are 1x2x1
236 /COM,
237 /COM,      LOCAL,15,0,0.0,0.0,0.0,45.0,0.0,0.0,
238 /COM, *****
239 /COM,      Construct geometry for a single SRP Pour Canister
240 /COM,      (K's 1 - 10 )
241 /COM,      (L's 1 - 16 )
242 /COM,      (A's 1 - 8 )
243 K, 1,      0.0,      0.0,      0.0,
244 K, 2,      (DRMOF+DRMOR),      (DRMOF+DRMOR),      0.0,
245 K, 3,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
246 K, 4,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
247 K, 5,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
248 K, 6,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
249 K, 7,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
250 K, 8,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
251 K, 9,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
252 K,10,(DRMOF+DRMOR-DRMIR/SQT),(DRMOF+DRMOR-DRMIR/SQT),      0.0,
253 L, 3, 2,
254 L, 2, 6,
255 L, 4, 2,
256 L, 2, 5,
257 LARC, 6, 5,2,CDRAD,
258 LARC, 5, 4,2,CDRAD,
259 LARC, 4, 3,2,CDRAD,
260 LARC, 3, 6,2,CDRAD,
261 L, 7, 3,
262 L,10, 6,
263 L, 9, 5,
264 L, 8, 4,
265 LARC, 7, 8,2,DRMOR,
266 LARC, 8, 9,2,DRMOR,
267 LARC, 9,10,2,DRMOR,
268 LARC,10, 7,2,DRMOR,
269 AL, 2, 4, 5,
270 AL, 1, 2, 8,
271 AL, 1, 3, 7,
272 AL, 3, 4, 6,
273 AL, 5,10,15,11,
274 AL, 8, 9,16,10,
275 AL, 7,12,13, 9,
276 AL, 6,11,14,12,
277 /COM, *****
278 /COM,      Interior and WP, Next
279 /COM,      (K's 11 - 19 )
280 /COM,      (L's 17 - 34 )
281 /COM,      (A's 9 - 16 )
282 K,11,      DCIRD,      0.0,      0.0,
283 K,12,      MI45,      0.0,
284 K,13,      0.0,      DCIRD,      0.0,
285 K,14,      (DCIRD+IWALL),      0.0,      0.0,
286 K,15,      MO45,      MO45,      0.0,
287 K,16,      0.0,      (DCIRD+IWALL),      0.0,
288 K,17,      DCORD,      0.0,      0.0,
289 K,18,      DO45,      DO45,      0.0,
290 K,19,      0.0,      DCORD,      0.0,
291 /COM,
292 L, 1, 7,
293 L,10,11,
294 L, 9,12,
295 L, 8,13,
296 L, 1,13,
297 L, 1,11,
298 LARC,11,12,1,DCIRD,

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299 LARC,12,13,1,DCIRD,
300 L,11,14,
301 L,12,15,
302 L,16,13,
303 LARC,14,15,1,(DCIRD+IWALL),
304 LARC,15,16,1,(DCIRD+IWALL),
305 L,14,17,
306 L,15,18,
307 L,19,16,
308 LARC,18,17,1,DCORD,
309 LARC,19,18,1,DCORD,
310 /COM,
311 AL,22,18,16,17,
312 AL,23,19,15,18,
313 AL,24,20,14,19,
314 AL,21,17,13,20,
315 AL,23,25,28,26,
316 AL,24,26,29,27,
317 AL,28,30,33,31,
318 AL,29,31,34,32,
319 /COM, *****
320 /COM, Set element shapes and sizes
321 /COM,
322 ESHAPE,2,
323 ESIZE,,1,
324 LSEL,S,LINE,, 1, 4,1,
325 LSEL,A,LINE,, 5, 8,1,
326 LSEL,A,LINE,,13,16,1,
327 LSEL,A,LINE,,21,24,1,
328 LSEL,A,LINE,,28,29,1,
329 LSEL,A,LINE,,33,34,1,
330 LESIZE,ALL,,, 4,
331 LSEL,S,LINE,, 9,12,1,
332 LESIZE,ALL,,, 1,
333 LSEL,S,LINE,,17,20,1,
334 LSEL,A,LINE,,25,27,1,
335 LSEL,A,LINE,,30,32,1,
336 LESIZE,ALL,,, 2,
337 LSEL,ALL,
338 /COM,
339 /COM, *****
340 /COM, Mesh areas
341 /COM, glass, stainless pour canister, He, 1B, 0B,
342 MAT,5,
343 TYPE,1,
344 AMESH, 1, 4,1
345 MAT,1,
346 TYPE,1,
347 AMESH, 5, 8,1
348 MAT, 7,
349 TYPE,1,
350 AMESH, 9,12,1
351 MAT,2,
352 TYPE,1,
353 AMESH,13,14,1
354 MAT,15,
355 TYPE,1,
356 AMESH,15,16,1
357 /COM, *****
358 /COM, Set up paths to extrude 3-D volumes from 2-D surfaces
359 /COM, (K's 20 - 31)
360 /COM, (L's 35 - 46)
361 /COM, Bottom direction first
362 K,20, 0.0, 0.0, (-1.0*BTPT4),
363 K,21, 0.0, 0.0, (-1.0*BTPT3),
364 K,22, 0.0, 0.0, (-1.0*BTPT2),
365 K,23, 0.0, 0.0, (-1.0*BTPT1),
366 K,24, 0.0, 0.0, (-1.0*MIDPT),
367 L, 1,20,
368 L,20,21,

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369 L,21,22,
370 L,22,23,
371 L,23,24,
372 /COM,      Top direction Next
373 K,25, 0.0, 0.0, TPPT6,
374 K,26, 0.0, 0.0, TPPT5,
375 K,27, 0.0, 0.0, TPPT4,
376 K,28, 0.0, 0.0, TPPT3,
377 K,29, 0.0, 0.0, TPPT2,
378 K,30, 0.0, 0.0, TPPT1,
379 K,31, 0.0, 0.0, MIDPT,
380 L, 1,25,
381 L,25,26,
382 L,26,27,
383 L,27,28,
384 L,28,29,
385 L,29,30,
386 L,30,31,
387 /COM,      *****
388 /COM,      Set number of element divisions for extrusion into 3-D
389 /COM,
390 ESHAPE,2,
391 /COM,      GLASS
392 LSEL,S,LINE,,35,
393 LESIZE,ALL,,, 3,
394 LSEL,S,LINE,,40,
395 LESIZE,ALL,,, 2,
396 /COM,      Interior He Space
397 LSEL,S,LINE,,41,
398 LESIZE,ALL,,, 2,
399 /COM,      Canister Shell
400 LSEL,S,LINE,,36,
401 LSEL,A,LINE,,42,
402 LESIZE,ALL,,, 1,
403 /COM,      Interior WP He Space
404 LSEL,S,LINE,,37,
405 LESIZE,ALL,,, 2,
406 LSEL,S,LINE,,43,
407 LESIZE,ALL,,, 3,
408 /COM,      Inner Barrier Lids
409 LSEL,S,LINE,,38,
410 LSEL,A,LINE,,44,
411 LESIZE,ALL,,, 2,
412 /COM,      Outer/Inner Barrier Gap (HE)
413 LSEL,S,LINE,,45,
414 LESIZE,ALL,,, 2,
415 /COM,      Outer Barrier Lids
416 LSEL,S,LINE,,39,
417 LSEL,A,LINE,,46,
418 LESIZE,ALL,,, 2,
419 LSEL,ALL,
420 /COM,      *****
421 /COM,      Reset coordinates if CSYS,15, option was used
422 /COM,
423 CSYS,0,
424 /COM,      *****
425 /COM,      Set up drift wall radiation matrix
426 /COM,      (K's 32 - 34)
427 /COM,      1) Define K's for extrude (will not use)
428 K,32, 0.0, OFFST, 0.0,
429 K,33, 0.0, OFFST, (WPSPC/2.0),
430 K,34, 0.0, OFFST, -1*(WPSPC/2.0),
431 /COM,      Define extrude lines (will not use)
432 /COM,      (L's 47,48 )
433 L,32,33,
434 L,32,34,
435 /COM,      Extrude drift 8 elements with smallest
436 /COM,      elements at WP mid-length (will not use)
437 LESIZE,47,,,8,8.4
438 LESIZE,48,,,8,8.4

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439 /COM,                2) Define K's and lines for lines of drift wall
440 /COM,                (K's 35 - 39)
441 /COM,                (L's 49 - 53)
442 /COM,                Center Point
443 K,35,                XXX,                YYY, 0.0,
444 K,36,                DFRAD,                OFFST, 0.0,
445 K,37,                0.0,( OFFST+DFRAD), 0.0,
446 K,38,(0.0-DFRAD),    OFFST, 0.0,
447 K,39, (0.0-XXX),      YYY, 0.0,
448 LARC,35,36,32,DFRAD,
449 LARC,36,37,32,DFRAD,
450 LARC,37,38,32,DFRAD,
451 LARC,38,39,32,DFRAD,
452 L,39,35,
453 /COM,                Set element spacing for meshing
454 LESIZE,49,,,4,
455 LESIZE,50,,,4,
456 LESIZE,51,,,4,
457 LESIZE,52,,,4,
458 LESIZE,53,,,4,
459 /COM,                Back Point
460 /COM,                (K's 40 - 44)
461 /COM,                (L's 54 - 58)
462 K,40,                XXX,                YYY, -1*(WSPC/2.0),
463 K,41,                DFRAD,                OFFST, -1*(WSPC/2.0),
464 K,42,                0.0,( OFFST+DFRAD), -1*(WSPC/2.0),
465 K,43,(0.0-DFRAD),    OFFST, -1*(WSPC/2.0),
466 K,44, (0.0-XXX),      YYY, -1*(WSPC/2.0),
467 LARC,40,41,34,DFRAD,
468 LARC,41,42,34,DFRAD,
469 LARC,42,43,34,DFRAD,
470 LARC,43,44,34,DFRAD,
471 L,44,40,
472 /COM,                Set element spacing for meshing
473 LESIZE,54,,,4,
474 LESIZE,55,,,4,
475 LESIZE,56,,,4,
476 LESIZE,57,,,4,
477 LESIZE,58,,,4,
478 /COM,                Front Point
479 /COM,                (K's 45 - 49)
480 /COM,                (L's 59 - 63)
481 K,45,                XXX,                YYY, (WSPC/2.0),
482 K,46,                DFRAD,                OFFST, (WSPC/2.0),
483 K,47,                0.0,( OFFST+DFRAD), (WSPC/2.0),
484 K,48,(0.0-DFRAD),    OFFST, (WSPC/2.0),
485 K,49, (0.0-XXX),      YYY, (WSPC/2.0),
486 LARC,45,46,33,DFRAD,
487 LARC,46,47,33,DFRAD,
488 LARC,47,48,33,DFRAD,
489 LARC,48,49,33,DFRAD,
490 L,49,45,
491 /COM,                Set element spacing for meshing
492 LESIZE,59,,,4,
493 LESIZE,60,,,4,
494 LESIZE,61,,,4,
495 LESIZE,62,,,4,
496 LESIZE,63,,,4,
497 /COM,                3) Create connecting lines for wall; make areas
498 /COM,                (L's 64 - 68 )
499 L,35,40,
500 L,36,41,
501 L,37,42,
502 L,38,43,
503 L,39,44,
504 LESIZE,64,,,8,8.4
505 LESIZE,65,,,8,8.4
506 LESIZE,66,,,8,8.4
507 LESIZE,67,,,8,8.4
508 LESIZE,68,,,8,8.4

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509 /COM, (L's 69 - 73 )
510 L,45,35,
511 L,46,36,
512 L,47,37,
513 L,48,38,
514 L,49,39,
515 LESIZE,69,,,8,0.119
516 LESIZE,70,,,8,0.119
517 LESIZE,71,,,8,0.119
518 LESIZE,72,,,8,0.119
519 LESIZE,73,,,8,0.119
520 /COM,
521 /COM, Define cylindrical coordinate system for rotations, etc.
522 LOCAL,11,1,0,0,0,0,0,
523 /COM, (A's 17 - 26 )
524 AL,49,65,54,64,
525 AL,50,66,55,65,
526 AL,51,67,56,66,
527 AL,52,68,57,67,
528 /COM,
529 AL,59,70,49,69,
530 AL,60,71,50,70,
531 AL,61,72,51,71,
532 AL,62,73,52,72,
533 /COM,
534 AL,53,64,58,68,
535 AL,63,69,53,73,
536 /COM,
537 CSYS,0,
538 /COM, 4) Set material type and Mesh areas
539 MAT, 6,
540 TYPE,11,
541 AMESH, 17, 24,1
542 MAT, 4,
543 TYPE,11,
544 AMESH, 25, 26,1
545 /COM, 5) Set 3-D radiation shell elements
546 TYPE,46,
547 ASEL,S,AREA,,17,26,1
548 NSLA,S,1,
549 ESURF,
550 ASEL,ALL,
551 LSEL,ALL,
552 KSEL,ALL,
553 /COM, *****
554 /COM, Construct geometry for WP TOP end
555 /COM, (K's 50 - 55 )
556 K,50, DCIRD, 0.0, TPPT4,
557 K,51, 0.0, DCIRD, TPPT4,
558 /COM,
559 K,52, (DCIRD+IWALL), 0.0, TPPT4,
560 K,53, 0.0, (DCIRD+IWALL), TPPT4,
561 /COM,
562 K,54, DCORD, 0.0, TPPT4,
563 K,55, 0.0, DCORD, TPPT4,
564 /COM,
565 /COM, (L's 74 - 79 )
566 L,27,50,
567 L,27,51,
568 L,50,52,
569 L,51,53,
570 L,52,54,
571 L,53,55,
572 /COM, (L's 80 - 82 )
573 LARC,50,51,27,DCIRD,
574 LARC,52,53,27,(DCIRD+IWALL),
575 LARC,54,55,27,DCORD,
576 /COM,
577 LSEL,S,LINE,,74,75,1,
578 LSEL,A,LINE,,80,82,1,

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579 LESIZE,ALL,,, 8,
580 LSEL,S,LINE,,76,79,1,
581 LESIZE,ALL,,, 2,
582 ASEL,ALL,
583 LSEL,ALL,
584 KSEL,ALL,
585 /COM, (A's 27 - 29 )
586 AL,74,75,80,
587 AL,80,76,81,77,
588 AL,81,78,82,79,
589 /COM, *****
590 /COM, Construct geometry for WP Bottom end
591 /COM, (K's 56 - 61 )
592 K,56, DCIRD, 0.0, (-1.0*BTPT3),
593 K,57, 0.0, DCIRD, (-1.0*BTPT3),
594 /COM,
595 K,58, (DCIRD+IWALL), 0.0, (-1.0*BTPT3),
596 K,59, 0.0, (DCIRD+IWALL), (-1.0*BTPT3),
597 /COM,
598 K,60, DCORD, 0.0, (-1.0*BTPT3),
599 K,61, 0.0, DCORD, (-1.0*BTPT3),
600 /COM,
601 /COM, (L's 83 - 88)
602 L,21,56,
603 L,21,57,
604 L,56,58,
605 L,57,59,
606 L,58,60,
607 L,59,61,
608 /COM, (L's 89 - 91 )
609 LARC,56,57,21,DCIRD,
610 LARC,58,59,21,(DCIRD+IWALL),
611 LARC,60,61,21,DCORD,
612 /COM,
613 LSEL,S,LINE,,83,84,1,
614 LSEL,A,LINE,,89,91,1,
615 LESIZE,ALL,,, 8,
616 LSEL,S,LINE,,85,88,1,
617 LESIZE,ALL,,, 2,
618 ASEL,ALL,
619 LSEL,ALL,
620 KSEL,ALL,
621 /COM, (A's 30 - 32 )
622 AL,83,84,89,
623 AL,89,85,90,86,
624 AL,90,87,91,88,
625 /COM, Mesh areas
626 /COM, Top and Bottom WP Ends
627 ESHAPE,2,
628 MAT,15,
629 TYPE,1,
630 AMESH,27,32,1
631 /COM, *****
632 /COM, Extrude 2-D WP Interior into 3-D Space
633 /COM, (V's 1 - 32)
634 /COM, Bottom WP Area
635 VDRAG, 1, 2, 3, 4,,,35,36,,,,
636 VDRAG, 5, 6, 7, 8,,,35,36,,,,
637 VDRAG, 9,10,11,12,,,35,36,,,,
638 VDRAG,13,14,,,,,35,36,,,,
639 VDRAG,15,16,,,,,35,36,,,,
640 NUMMRG,KP,
641 /COM, (V's 33 - 80)
642 /COM, Top WP Area
643 VDRAG, 1, 2, 3, 4,,,40,41,42,,,,
644 VDRAG, 5, 6, 7, 8,,,40,41,42,,,,
645 VDRAG, 9,10,11,12,,,40,41,42,,,,
646 VDRAG,13,14,,,,,40,41,42,,,,
647 VDRAG,15,16,,,,,40,41,42,,,,
648 NUMMRG,KP,

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649 /COM,          Extrude 2-D WP Ends into 3-D Space
650 /COM,          (V's 81 - 89)
651 /COM,          Bottom WP Area
652 VDRAG,30,31,32,,,,,37,38,39,
653 NUMMRG,KP,
654 /COM,          (V's 90 - 101)
655 /COM,          Top WP Area
656 VDRAG,27,28,29,,,,,43,44,45,46,
657 NUMMRG,KP,
658 /COM,          *****
659 /COM,          Mesh Volumes - which are solid volumes - leave gaps to last
660 /COM,          Glass First
661 ESHAPE,2,
662 MAT, 5,
663 TYPE,2,
664 VMESH, 1, 4,1
665 VMESH, 33, 36,1
666 /COM,          SS in Pour Can.
667 ESHAPE,2,
668 MAT, 1,
669 TYPE,2,
670 VMESH, 5, 8,1
671 VMESH, 9, 16,1
672 VMESH, 41, 44,1
673 VMESH, 45, 56,1
674 /COM,          In. Bar. Material for WP
675 ESHAPE,2,
676 MAT, 2,
677 TYPE,2,
678 VMESH, 25, 28,1
679 VMESH, 69, 74,1
680 VMESH, 82,
681 VMESH, 84, 85,1
682 VMESH, 91,
683 VMESH, 93, 94,1
684 /COM,          Out. Bar. Material for WP
685 ESHAPE,2,
686 MAT,15,
687 TYPE,2,
688 VMESH, 29, 32,1
689 VMESH, 75, 80,1
690 VMESH, 83,
691 VMESH, 86, 89,1
692 VMESH, 92, 95,3
693 VMESH, 98,101,1
694 /COM,          DONT MESH OR ASSIGN MAT. ASSUME VOID SPACES
695 /COM,          AND NO RADIATION TRANSFER IN THESE SPACES
696 /COM,          He/Air in Pour Can.
697 /COM,          ESHAPE,2,
698 /COM,          MAT, 7,
699 /COM,          TYPE,2,
700 /COM,          VMESH, 37, 40,1
701 /COM,          He/Air in WP I/O Bar. Gap - NO RADIATION
702 /COM,          ESHAPE,2,
703 /COM,          MAT, 7,
704 /COM,          TYPE,2,
705 /COM,          VMESH, 96, 97,1
706 /COM,          *****
707 /COM,          Clear 2-D mesh
708 ASEL,S,TYPE,,1,
709 ACLEAR,ALL,
710 ASEL,ALL,
711 ESEL,ALL,
712 NSEL,ALL,
713 VSEL,ALL,
714 LSEL,ALL,
715 NUMMRG,ELEM,
716 NUMMRG,NODE,
717 NUMMRG,KP,
718 /COM,          *****

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719 /COM,      Rotate this set into the other quadrants about the Z axis
720 /COM,      (V's 102 - 404)
721 /COM,
722 CSYS,11,
723 /COM,
724 /COM,      (V's 102 - 202)
725 VGEN,2,1,101,1,0.0, 90.0,0.0,0,0,0,
726 /COM,      (V's 203 - 303)
727 VGEN,2,1,101,1,0.0,180.0,0.0,0,0,0,
728 /COM,      (V's 304 - 404)
729 VGEN,2,1,101,1,0.0,270.0,0.0,0,0,0,
730 CSYS,0,
731 NUMMRG,ELEM,
732 NUMMRG,NODE,
733 NUMMRG,KP,
734 /COM,      *****
735 /COM,      Define Some LOCAL Coordinatate Systems for use
736 /COM,      IF THE CSYS,15, WAS USED... THESE MUST BE REDEFINED TO THE
737 /COM,      POUR CANISTER CENTER LINES.... I.E. THE X-Y's ARE ON AXIS
738 /COM,
739 LOCAL,21,0,      (DRMOF+DRMOR),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
740 LOCAL,22,0,      (DRMOF+DRMOR),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
741 LOCAL,23,0,(-1.0*(DRMOF+DRMOR)),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
742 LOCAL,24,0,(-1.0*(DRMOF+DRMOR)),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
743 /COM,
744 LOCAL,31,1,      (DRMOF+DRMOR),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
745 LOCAL,32,1,      (DRMOF+DRMOR),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
746 LOCAL,33,1,(-1.0*(DRMOF+DRMOR)),(-1.0*(DRMOF+DRMOR)),0.0,0.0,0.0,0.0,
747 LOCAL,34,1,(-1.0*(DRMOF+DRMOR)),      (DRMOF+DRMOR),0.0,0.0,0.0,0.0,
748 /COM,
749 CSYS,0,
750 /COM,      *****
751 /COM,      Define Elements for radiation
752 /COM, In Pour Canister First; Glass Surf. Can #1 - ASSUME NO RAD. DONT DO
753 /COM,      TYPE,6,
754 /COM,      VSEL,S,MAT,,5,
755 /COM,      ASEL,S,EXT,
756 /COM,      CSYS,31,
757 /COM,      ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
758 /COM,      CSYS,0,
759 /COM,      ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
760 /COM,      NSLA,S,1,
761 /COM,      ESURF,
762 /COM,      Inner SS. Lid of Can. #1
763 /COM,      TYPE,6,
764 /COM,      VSEL,S,MAT,,1,
765 /COM,      ASEL,S,EXT,
766 /COM,      CSYS,31,
767 /COM,      ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
768 /COM,      CSYS,0,
769 /COM,      ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
770 /COM,      ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
771 /COM,      NSLA,S,1,
772 /COM,      ESURF,
773 /COM,      Inner SS. Side of Can. #1
774 /COM,      TYPE,6,
775 /COM,      VSEL,S,MAT,,1,
776 /COM,      ASEL,S,EXT,
777 /COM,      ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
778 /COM,      ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
779 /COM,      CSYS,31,
780 /COM,      ASEL,U,LOC,X,(DRMIR+0.0001),100.0
781 /COM,      CSYS,0,
782 /COM,      NSLA,S,1,
783 /COM,      ESURF,
784 /COM,      *****
785 /COM,      Define Elements for radiation
786 /COM,      In Pour Canister First; Glass Surf. Can #2
787 /COM,      TYPE,6,
788 /COM,      VSEL,S,MAT,,5,

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789 /COM, ASEL,S,EXT,
790 /COM, CSYS,32,
791 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
792 /COM, CSYS,0,
793 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
794 /COM, NSLA,S,1,
795 /COM, ESURF,
796 /COM, Inner SS. Lid of Can. #2
797 /COM, TYPE,6,
798 /COM, VSEL,S,MAT,,1,
799 /COM, ASEL,S,EXT,
800 /COM, CSYS,32,
801 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
802 /COM, CSYS,0,
803 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
804 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
805 /COM, NSLA,S,1,
806 /COM, ESURF,
807 /COM, Inner SS. Side of Can. #2
808 /COM, TYPE,6,
809 /COM, VSEL,S,MAT,,1,
810 /COM, ASEL,S,EXT,
811 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
812 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
813 /COM, CSYS,32,
814 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
815 /COM, CSYS,0,
816 /COM, NSLA,S,1,
817 /COM, ESURF,
818 /COM, *****
819 /COM, Define Elements for radiation
820 /COM, In Pour Canister First; Glass Surf. Can #3
821 /COM, TYPE,6,
822 /COM, VSEL,S,MAT,,5,
823 /COM, ASEL,S,EXT,
824 /COM, CSYS,33,
825 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
826 /COM, CSYS,0,
827 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
828 /COM, NSLA,S,1,
829 /COM, ESURF,
830 /COM, Inner SS. Lid of Can. #3
831 /COM, TYPE,6,
832 /COM, VSEL,S,MAT,,1,
833 /COM, ASEL,S,EXT,
834 /COM, CSYS,33,
835 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
836 /COM, CSYS,0,
837 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
838 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
839 /COM, NSLA,S,1,
840 /COM, ESURF,
841 /COM, Inner SS. Side of Can. #3
842 /COM, TYPE,6,
843 /COM, VSEL,S,MAT,,1,
844 /COM, ASEL,S,EXT,
845 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
846 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
847 /COM, CSYS,33,
848 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
849 /COM, CSYS,0,
850 /COM, NSLA,S,1,
851 /COM, ESURF,
852 /COM, *****
853 /COM, Define Elements for radiation
854 /COM, In Pour Canister First; Glass Surf. Can #4
855 /COM, TYPE,6,
856 /COM, VSEL,S,MAT,,5,
857 /COM, ASEL,S,EXT,
858 /COM, CSYS,34,

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859 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
860 /COM, CSYS,0,
861 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
862 /COM, NSLA,S,1,
863 /COM, ESURF,
864 /COM, Inner SS. Lid of Can. #4
865 /COM, TYPE,6,
866 /COM, VSEL,S,MAT,,1,
867 /COM, ASEL,S,EXT,
868 /COM, CSYS,34,
869 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
870 /COM, CSYS,0,
871 /COM, ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
872 /COM, ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
873 /COM, NSLA,S,1,
874 /COM, ESURF,
875 /COM, Inner SS. Side of Can. #4
876 /COM, TYPE,6,
877 /COM, VSEL,S,MAT,,1,
878 /COM, ASEL,S,EXT,
879 /COM, ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
880 /COM, ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
881 /COM, CSYS,34,
882 /COM, ASEL,U,LOC,X,(DRMIR+0.0001),100.0
883 /COM, CSYS,0,
884 /COM, NSLA,S,1,
885 /COM, ESURF,
886 /COM, *****
887 /COM, Define Elements for radiation - Between Can and IB
888 /COM, Pour Can. Surf.
889 /COM, Top Can #1
890 TYPE,26,
891 VSEL,S,MAT,,1,
892 ASEL,S,EXT,
893 CSYS,31,
894 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
895 CSYS,0,
896 ASEL,R,LOC,Z,TPPT4,TPPT4,
897 NSLA,S,1,
898 ESURF,
899 /COM, Sides Can #1
900 TYPE,26,
901 VSEL,S,MAT,,1,
902 ASEL,S,EXT,
903 ASEL,U,LOC,Z,(TPPT4-0.0001),100.0,
904 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),-100.0,
905 CSYS,31,
906 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
907 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
908 CSYS,0,
909 NSLA,S,1,
910 ESURF,
911 /COM, Bottom Can #1
912 TYPE,26,
913 VSEL,S,MAT,,1,
914 ASEL,S,EXT,
915 CSYS,31,
916 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
917 CSYS,0,
918 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
919 NSLA,S,1,
920 ESURF,
921 /COM, -----
922 /COM, Top Can #2
923 TYPE,26,
924 VSEL,S,MAT,,1,
925 ASEL,S,EXT,
926 CSYS,32,
927 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
928 CSYS,0,

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929 ASEL,R,LOC,Z,TPPT4,TPPT4,
930 NSLA,S,1,
931 ESURF,
932 /COM,                Sides Can #2
933 TYPE,26,
934 VSEL,S,MAT,,1,
935 ASEL,S,EXT,
936 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
937 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
938 CSYS,32,
939 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
940 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
941 CSYS,0,
942 NSLA,S,1,
943 ESURF,
944 /COM,                Bottom Can #2
945 TYPE,26,
946 VSEL,S,MAT,,1,
947 ASEL,S,EXT,
948 CSYS,32,
949 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
950 CSYS,0,
951 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
952 NSLA,S,1,
953 ESURF,
954 /COM, -----
955 /COM,                Top Can #3
956 TYPE,26,
957 VSEL,S,MAT,,1,
958 ASEL,S,EXT,
959 CSYS,33,
960 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
961 CSYS,0,
962 ASEL,R,LOC,Z,TPPT4,TPPT4,
963 NSLA,S,1,
964 ESURF,
965 /COM,                Sides Can #3
966 TYPE,26,
967 VSEL,S,MAT,,1,
968 ASEL,S,EXT,
969 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
970 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
971 CSYS,33,
972 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
973 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
974 CSYS,0,
975 NSLA,S,1,
976 ESURF,
977 /COM,                Bottom Can #3
978 TYPE,26,
979 VSEL,S,MAT,,1,
980 ASEL,S,EXT,
981 CSYS,33,
982 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
983 CSYS,0,
984 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
985 NSLA,S,1,
986 ESURF,
987 /COM, -----
988 /COM,                Top Can #4
989 TYPE,26,
990 VSEL,S,MAT,,1,
991 ASEL,S,EXT,
992 CSYS,34,
993 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
994 CSYS,0,
995 ASEL,R,LOC,Z,TPPT4,TPPT4,
996 NSLA,S,1,
997 ESURF,
998 /COM,                Sides Can #4

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999 TYPE,26,
1000 VSEL,S,MAT,,1,
1001 ASEL,S,EXT,
1002 ASEL,U,LOC,Z,(TPPT4-0.001),100.0,
1003 ASEL,U,LOC,Z,(-1.0*BTPT3+0.001),-100.0,
1004 CSYS,34,
1005 ASEL,U,LOC,X,0.0,(DRMOR-0.0001),
1006 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
1007 CSYS,0,
1008 NSLA,S,1,
1009 ESURF,
1010 /COM, Bottom Can #4
1011 TYPE,26,
1012 VSEL,S,MAT,,1,
1013 ASEL,S,EXT,
1014 CSYS,34,
1015 ASEL,U,LOC,X,(DRMOR+0.0001),100.0
1016 CSYS,0,
1017 ASEL,U,LOC,Z,(-1.0*BTPT3+0.0001),100.0,
1018 NSLA,S,1,
1019 ESURF,
1020 /COM, Inner Barrier Inside Surfaces
1021 TYPE,26,
1022 VSEL,S,MAT,,2,
1023 ASEL,S,EXT,
1024 ASEL,U,LOC,Z,(TPPT3+0.001),100,
1025 ASEL,U,LOC,Z,(-1.0*BTPT2-0.001),-100,
1026 CSYS,11,
1027 ASEL,U,LOC,X,(DCIRD+0.001),100,
1028 CSYS,0,
1029 NSLA,S,1,
1030 ESURF,
1031 /COM, *****
1032 /COM, Define Elements for radiation
1033 /COM, In Inner Barrier / Out Barrier Gap - ASSUME NO RAD: SO DONT DEFINE
1034 /COM, Top of Inner Barrier Lid
1035 /COM, TYPE,16,
1036 /COM, VSEL,S,MAT,,2,
1037 /COM, ASEL,S,EXT,
1038 /COM, ASEL,R,LOC,Z,(TPPT2-0.001),(TPPT2+0.001),
1039 /COM, NSLA,S,1,
1040 /COM, ESURF,
1041 /COM, Bottom of Outer Barrier Lid
1042 /COM, TYPE,16,
1043 /COM, ASEL,S,LOC,Z,(TPPT1-0.001),(TPPT1+0.001),
1044 /COM, ASEL,U,AREA,,346,
1045 /COM, ASEL,U,AREA,,702,
1046 /COM, ASEL,U,AREA,,1058,
1047 /COM, ASEL,U,AREA,,1414,
1048 /COM, NSLA,S,1,
1049 /COM, ESURF,
1050 /COM, Side of Outer Barrier WP (Inside Surface)
1051 /COM, TYPE,16,
1052 /COM, VSEL,S,MAT,,15,
1053 /COM, ASEL,S,EXT,
1054 /COM, CSYS,11,
1055 /COM, ASEL,U,LOC,X,(DCORD-IWALL),100,
1056 /COM, CSYS,0,
1057 /COM, ASEL,U,LOC,Z,-100,TPPT2,
1058 /COM, ASEL,U,LOC,Z,TPPT1,100,
1059 /COM, NSLA,S,1,
1060 /COM, ESURF,
1061 /COM, *****
1062 /COM, Define Elements for radiation
1063 /COM, Outer Surface of Waste Package
1064 TYPE,36,
1065 /COM, Bottom Lid
1066 VSEL,S,MAT,,15,
1067 ASEL,S,EXT,
1068 ASEL,R,LOC,Z,(-1.0*MIDPT+0.001),(-1.0*MIDPT-0.001),

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1069 NSLA,S,1,
1070 ESURF,
1071 /COM, Side of WP
1072 VSEL,S,MAT,,15,
1073 ASEL,S,EXT,
1074 CSYS,11,
1075 ASEL,U,LOC,X,(-1.0*DCORD+0.001),(DCORD-0.001),
1076 CSYS,0,
1077 NSLA,S,1,
1078 ESURF,
1079 /COM, Top Lid
1080 VSEL,S,MAT,,15,
1081 ASEL,S,EXT,
1082 ASEL,R,LOC,Z,(MIDPT-0.001),(MIDPT+0.001),
1083 NSLA,S,1,
1084 ESURF,
1085 FINISH
1086 SAVE,
1087 /COM, *****
1088 /COM, Generate super-elements
1089 /AUX12,
1090 /COM,
1091 ESEL,S,TYPE,,26,
1092 NSLE,S,
1093 STEF,5.67E-8,
1094 GEOM,0,
1095 VTYPE,0,100,
1096 WRITE,ibrangap,
1097 ESEL,ALL,
1098 NSEL,ALL,
1099 FINISH
1100 /COM,
1101 /AUX12,
1102 ESEL,S,TYPE,,36,
1103 ESEL,A,TYPE,,46,
1104 NSLE,S,
1105 STEF,5.67E-8,
1106 GEOM,0,
1107 VTYPE,0,100,
1108 WRITE,obrdrwgap,
1109 ESEL,ALL,
1110 NSEL,ALL,
1111 FINISH
1112 /COM, - DO NOT DO RADITATION FOR INTERNAL P. CAN OR THE I/O B. GAP
1113 /COM, /AUX12,
1114 /COM, ESEL,S,TYPE,,16,
1115 /COM, NSLE,S,
1116 /COM, STEF,5.67E-8,
1117 /COM, GEOM,0,
1118 /COM, VTYPE,0,100,
1119 /COM, WRITE,iobargap,
1120 /COM, ESEL,ALL,
1121 /COM, NSEL,ALL,
1122 /COM, FINISH
1123 /COM, /COM,
1124 /COM, /AUX12,
1125 /COM, ESEL,S,TYPE,,6,
1126 /COM, NSLE,S,
1127 /COM, STEF,5.67E-8,
1128 /COM, GEOM,0,
1129 /COM, VTYPE,0,100,
1130 /COM, WRITE,glscangap,
1131 /COM,
1132 ESEL,ALL,
1133 NSEL,ALL,
1134 FINISH
1135 /PREP7,
1136 TYPE,18,
1137 /COM, SE,glscangap,
1138 /COM, SE,iobargap,

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1139 SE,ibrcangap,
1140 SE,obrdwgap,
1141 /COM,          Delete radiation edge elements
1142 ESEL,S,TYPE,, 6,
1143 ESEL,A,TYPE,,16,
1144 ESEL,A,TYPE,,26,
1145 ESEL,A,TYPE,,36,
1146 ESEL,A,TYPE,,46,
1147 EDELE,ALL,
1148 ESEL,ALL,
1149 LSEL,ALL,
1150 /COM,          *****
1151 /COM,          Define SHELL Element thicknesses; Required for solution:
1152 R,1,0.001,0.001,0.001,0.001,0.0,
1153 FINISH
1154 SAVE,
1155 /COM,          *****
1156 /COM,          Gaps in WP between glass, can, Inner Barrier and Outer Barrier.....
1157 /COM,          DONT MESH; Either Assume its VOID or its meshed earlier
1158 /COM,          This section used only if both rad. and He conducti
1159 /COM,          is used in the model.
1160 /COM,          He/Air in WP I/O Bar. Gap
1161 /COM,          /PREP7
1162 /COM,          ESHAPE,2,
1163 /COM,          MAT, 7,
1164 /COM,          TYPE,2,
1165 /COM,          VMESH, 96, 97,1
1166 /COM,          VMESH,197,198,1
1167 /COM,          VMESH,298,299,1
1168 /COM,          VMESH,399,400,1
1169 /COM,
1170 /COM,
1171 /COM,          Now Mesh inside of WP; DONT MESH Assume VOID
1172 /COM,          He space in WP
1173 /COM,          ESHAPE,2,
1174 /COM,          MAT, 7,
1175 /COM,          TYPE,2,
1176 /COM,          VMESH, 17, 24,1
1177 /COM,          VMESH,118,125,1
1178 /COM,          VMESH,219,226,1
1179 /COM,          VMESH,320,327,1
1180 /COM,
1181 /COM,          VMESH, 57, 68,1
1182 /COM,          VMESH,158,169,1
1183 /COM,          VMESH,259,270,1
1184 /COM,          VMESH,360,371,1
1185 /COM,
1186 /COM,          VMESH, 81,
1187 /COM,          VMESH,182,
1188 /COM,          VMESH,283,
1189 /COM,          VMESH,384,
1190 /COM,
1191 /COM,          VMESH, 90,
1192 /COM,          VMESH,191,
1193 /COM,          VMESH,292,
1194 /COM,          VMESH,393,
1195 /COM,
1196 /COM,          Now Mesh inside of Can DONT MESH Assume VOID
1197 /COM,          He/Air in Pour Can.
1198 /COM,          ESHAPE,2,
1199 /COM,          MAT, 7,
1200 /COM,          TYPE,2,
1201 /COM,          VMESH, 37, 40,1
1202 /COM,          VMESH,138,141,1
1203 /COM,          VMESH,239,242,1
1204 /COM,          VMESH,340,343,1
1205 /COM,
1206 /COM,          NUMMRG,ELEM,
1207 /COM,          NUMMRG,NODE,
1208 /COM,          NUMMRG,KP,

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1209 /COM, FINISH
1210 /COM, *****
1211 /COM, Create element mesh plots to illustrate model
1212 /POST1,
1213 /COM, View model meshing from drift end view
1214 /RESET,
1215 /TYPE,,HIDP,
1216 /VIEW,1,0,0,1,
1217 /DIST,1,5,0,
1218 /NUM, 1,
1219 /TRIAD,OFF,
1220 /PNUM,MAT , 1,
1221 VSEL,S,LOC,Z,-100,0.0,
1222 ESLV,S
1223 ASEL,S,AREA,,17,26,1
1224 ASEL,R,LOC,Z,-100.0,0.0,
1225 ESLA,A
1226 /TITLE, DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH
1227 /SHOW,meshfct,grph,0,8,
1228 EPLLOT
1229 /COM, View model meshing for 45 side cut-away
1230 /RESET,
1231 /TYPE,,HIDP,
1232 /VIEW,1,1,1,1,
1233 /DIST,1,5,0,
1234 /NUM, 1,
1235 /TRIAD,OFF,
1236 /PNUM,MAT , 1,
1237 VSEL,S,MAT,,1,5,4
1238 CSYS,31,
1239 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1240 VSEL,U,LOC,Y,-45.0,135.0,
1241 CSYS,0,
1242 ESLV,S
1243 VSEL,S,MAT,,1,5,4
1244 CSYS,32,
1245 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1246 VSEL,U,LOC,Y,-45.0,45.0,
1247 CSYS,0,
1248 ESLV,A
1249 VSEL,S,LOC,X,-100.0,0.0,
1250 ESLV,A
1251 ASEL,S,AREA,,17,26,1
1252 ASEL,R,LOC,X,-100.0,0.0,
1253 ESLA,A
1254 /TITLE, DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH
1255 /SHOW,meshcut,grph,0,8,
1256 EPLLOT
1257 /COM, View model meshing for 90 side cut-away
1258 /RESET,
1259 /TYPE,,HIDP,
1260 /VIEW,1,1,0,0,
1261 /DIST,1,5,0,
1262 /NUM, 1,
1263 /TRIAD,OFF,
1264 /PNUM,MAT , 1,
1265 VSEL,S,LOC,X,-100,0.0,
1266 ESLV,S
1267 ASEL,S,AREA,,17,26,1
1268 ASEL,R,LOC,X,-100.0,0.0,
1269 ESLA,A
1270 /TITLE, DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH
1271 /SHOW,meshsct,grph,0,8,
1272 EPLLOT
1273 FINISH
1274 /COM, *****
1275 /COM, Set solution parameters and apply B.C.'s
1276 /COM,
1277 /COM, Solve steady-state for initial conditions
1278 /COM, with WP surface equal to drift ambient

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1279 /COM,          temperature from repository model.
1280 /SOLU
1281 ANTYPE,TRAN,NEW,
1282 NROPT,AUTO,
1283 TRNOPT,FULL,
1284 TOFFST,273.15,
1285 /COM,          Apply Drift Wall Temp. BC
1286 ASEL,S,AREA,,17,26,1
1287 NSLA,S,1,
1288 D,ALL,TEMP,DFAMBT,
1289 ASEL,ALL,
1290 NSEL,ALL,
1291 /COM,          Apply Heat Generation BC to glass
1292 VSEL,S,MAT,,5,
1293 ESLV,S,
1294 BFE,ALL,HGEN,,(FUEL(TM_START)),
1295 VSEL,ALL,
1296 NSEL,ALL,
1297 ESEL,ALL,
1298 /COM,          Set Solution Params and solve
1299 TIMINT,OFF,
1300 TIME,1e-6,
1301 AUTOTS,ON,
1302 KBC,0,
1303 SOLVE
1304 /COM,
1305 /COM,          Solve steady-state for initial conditions
1306 /COM,          with WP surface temperatures from repository
1307 /COM,          steady-state solution.
1308 /COM,          Apply Drift Wall Temp. BC
1309 ASEL,S,AREA,,17,26,1
1310 NSLA,S,1,
1311 DDELE,ALL,TEMP,
1312 ASEL,ALL,
1313 NSEL,ALL,
1314 ASEL,S,AREA,,17,26,1
1315 NSLA,S,1,
1316 D,ALL,TEMP,(DFSID(TM_START)),
1317 ASEL,ALL,
1318 NSEL,ALL,
1319 /COM,          Apply Heat Generation BC to glass
1320 VSEL,S,MAT,,5,
1321 ESLV,S,
1322 BFE,ALL,HGEN,,(FUEL(TM_START)),
1323 VSEL,ALL,
1324 NSEL,ALL,
1325 ESEL,ALL,
1326 /COM,          Set Solution Params and solve
1327 TIMINT,OFF,
1328 TIME,2e-6,
1329 AUTOTS,ON,
1330 KBC,0,
1331 SOLVE
1332 SAVE,
1333 /COM,          *****
1334 /COM,          SOLVE A SET OF STEADY STATE POINTS FOR GRINS AND GIGGLES
1335 TIMINT,OFF,
1336 AUTOTS,ON,
1337 /COM,          Time substep ranges from 10 sec to 1/4 loadstep
1338 /COM,          NSUBST,10,20,5,ON
1339 /COM,          Begin Transient
1340 /COM,          Apply loads and solve for 0 to .9 years
1341 *DO,TM,TM_START,TME0,TM10
1342 TIME,TM,
1343 VSEL,S,MAT,,5,
1344 ESLV,S,
1345 BFE,ALL,HGEN,,(FUEL(TM)),
1346 VSEL,ALL
1347 ESEL,ALL
1348 ASEL,S,AREA,,17,26,1

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1349      NSLA,S,1,
1350      DDELE,ALL,TEMP,
1351      ASEL,ALL,
1352      NSEL,ALL,
1353      ASEL,S,AREA,,17,26,1
1354      NSLA,S,1,
1355      D,ALL,TEMP,(DFSID(TM)),
1356      ASEL,ALL,
1357      NSEL,ALL,
1358      SOLVE
1359 *ENDDO
1360 /COM,      NSUBST,10,25,10,ON
1361 /COM,      Apply loads and solve for 1 to 9 years
1362 *DO,TM,TME1,TME9,TMI1
1363      TIME,TM,
1364      VSEL,S,MAT,,5,
1365      ESLV,S,
1366      BFE,ALL,HGEN,,(FUEL(TM)),
1367      VSEL,ALL
1368      ESEL,ALL
1369      ASEL,S,AREA,,17,26,1
1370      NSLA,S,1,
1371      DDELE,ALL,TEMP,
1372      ASEL,ALL,
1373      NSEL,ALL,
1374      ASEL,S,AREA,,17,26,1
1375      NSLA,S,1,
1376      D,ALL,TEMP,(DFSID(TM)),
1377      ASEL,ALL,
1378      NSEL,ALL,
1379      SOLVE
1380 *ENDDO
1381 /COM,      NSUBST,17,40,15,ON
1382 /COM,      Apply loads and solve for 10 to 90 years
1383 *DO,TM,TME10,TME90,TMI10
1384      TIME,TM,
1385      VSEL,S,MAT,,5,
1386      ESLV,S,
1387      BFE,ALL,HGEN,,(FUEL(TM)),
1388      VSEL,ALL
1389      ESEL,ALL
1390      ASEL,S,AREA,,17,26,1
1391      NSLA,S,1,
1392      DDELE,ALL,TEMP,
1393      ASEL,ALL,
1394      NSEL,ALL,
1395      ASEL,S,AREA,,17,26,1
1396      NSLA,S,1,
1397      D,ALL,TEMP,(DFSID(TM)),
1398      ASEL,ALL,
1399      NSEL,ALL,
1400      SOLVE
1401 *ENDDO
1402 /COM,      NSUBST,22,60,20,ON
1403 /COM,      Apply loads and solve for 100 to 1000 years
1404 *DO,TM,TME100,TME1000,TMI100
1405      TIME,TM,
1406      VSEL,S,MAT,,5,
1407      ESLV,S,
1408      BFE,ALL,HGEN,,(FUEL(TM)),
1409      VSEL,ALL
1410      ESEL,ALL
1411      ASEL,S,AREA,,17,26,1
1412      NSLA,S,1,
1413      DDELE,ALL,TEMP,
1414      ASEL,ALL,
1415      NSEL,ALL,
1416      ASEL,S,AREA,,17,26,1
1417      NSLA,S,1,
1418      D,ALL,TEMP,(DFSID(TM)),

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1419      ASEL,ALL,
1420      NSEL,ALL,
1421      SOLVE
1422 *ENDDO
1423 FINISH
1424 /COM, *****
1425 /COM,      Create element contour plots of solution results
1426 /COM,
1427 /COM,      Sort through solution results for time of max temp.
1428 /POST26,
1429 NSOL,2,(NODE((DRMOR+DRMOF),(-1.0*(DRMOR+DRMOF)),(-0.66*BTPT4))),TEMP,,peakgls,
1430 STORE,NEW,
1431 *GET,TMTMAX,VARI,2,EXTREM,TMAX,
1432 FINISH
1433 /POST1,
1434 /COM,      Create temperature contour plots of WP at peak
1435 /RESET,
1436 /TYPE,,HIDP,
1437 /VIEW,1,1,1,1,
1438 /DIST,1,3,0,
1439 /NUM, 1,
1440 /GLINE,,-1,
1441 /TRIAD,OFF,
1442 /PNUM,MAT, 1,
1443 VSEL,S,MAT,,1,5,4
1444 CSYS,31,
1445 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1446 VSEL,U,LOC,Y,-45.0,135.0,
1447 CSYS,0,
1448 ESLV,S
1449 VSEL,S,MAT,,1,5,4
1450 CSYS,32,
1451 VSEL,U,LOC,X,(DRMOR+0.0001),100.0,
1452 VSEL,U,LOC,Y,-45.0,45.0,
1453 CSYS,0,
1454 ESLV,A
1455 VSEL,S,LOC,X,-100.0,0.0,
1456 ESLV,A
1457 ASEL,S,AREA,,17,26,1
1458 ASEL,R,LOC,X,-100.0,0.0,
1459 ESLA,A
1460 SET,NEAR,,,,TMTMAX,
1461 /TITLE, DHLW WP at Time of Peak Temp. (%TMTMAX/3.15576E7% years)
1462 /SHOW,solupk,grph,0,8,
1463 /CONTOUR,1,128,AUTO,
1464 PLNSOL,TEMP,
1465 /COM,      Create temperature contour plots at 5, 10, 50, and 100 yrs
1466 SET,NEAR,,,,(TM_START+(5*TM11)),
1467 /TITLE, DHLW WP at 5 years
1468 /SHOW,solu5,grph,0,8,
1469 /CONTOUR,1,128,USER,
1470 PLNSOL,TEMP,
1471 SET,NEAR,,,,TME10,
1472 /TITLE, DHLW WP at 10 years
1473 /SHOW,solu10,grph,0,8,
1474 /CONTOUR,1,128,USER,
1475 PLNSOL,TEMP,
1476 SET,NEAR,,,,TME50,
1477 /TITLE, DHLW WP at 50 years
1478 /SHOW,solu50,grph,0,8,
1479 /CONTOUR,1,128,USER,
1480 PLNSOL,TEMP,
1481 SET,NEAR,,,,TME100,
1482 /TITLE, DHLW WP at 100 years
1483 /SHOW,solu100,grph,0,8,
1484 /CONTOUR,1,128,USER,
1485 PLNSOL,TEMP,
1486 ESEL,ALL,
1487 FINISH
1488 /COM, *****

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1489 /COM,      Print time/temperature output at specific locations
1490 /COM,      Save profile from center to edge
1491 /COM,
1492 /COM,      Variable Legend: A01i000
1493 /COM,      t = structural stainless Canister near center line
1494 /COM,      c = center of Glass log
1495 /COM,      h = halfway between center and Canister
1496 /COM,      s = structural stainless Canister
1497 /COM,      i = inner barrier of DC
1498 /COM,      o = outer barrier of DC
1499 /COM,      ## = cartesian quadrant number of Canister
1500 /COM,      i = side of assembly toward center of WP
1501 /COM,      o = side of assembly toward edge of WP
1502 /COM,      045 = profile 45 deg down
1503 /COM,      135 = profile 45 deg up
1504 /POST26,
1505 NUMVAR,32,
1506 /COM,      *****
1507 /COM,      *Temperature Profile from center to lower right (45 deg.) z=2/3*
1508 /COM,      *****
1509 NSOL, 2,(NODE(TCO45, (-1.0*TCO45),(-0.33*BTPT4))),TEMP,,t94i045,
1510 NSOL, 3,(NODE(TCI45, (-1.0*TCI45),(-0.33*BTPT4))),TEMP,,t94o045,
1511 NSOL, 4,(NODE(HCI45, (-1.0*HCI45),(-0.33*BTPT4))),TEMP,,h94i045,
1512 NSOL, 5,(NODE(CCO45, (-1.0*CCO45),(-0.33*BTPT4))),TEMP,,c94i045,
1513 NSOL, 6,(NODE(HCO45, (-1.0*HCO45),(-0.33*BTPT4))),TEMP,,h94o045,
1514 NSOL, 7,(NODE(SCI45, (-1.0*SCI45),(-0.33*BTPT4))),TEMP,,s94i045,
1515 NSOL, 8,(NODE(SCO45, (-1.0*SCO45),(-0.33*BTPT4))),TEMP,,s94o045,
1516 NSOL, 9,(NODE(MI45, (-1.0*MI45),(-0.33*BTPT4))),TEMP,,i94i045,
1517 NSOL,10,(NODE(MO45, (-1.0*MO45),(-0.33*BTPT4))),TEMP,,i94o045,
1518 NSOL,11,(NODE(DO45, (-1.0*DO45),(-0.33*BTPT4))),TEMP,,o94o045,
1519 PRVAR, 2, 3, 4, 5, 6, 7,
1520 PRVAR, 8, 9,10,11,
1521 /COM,      *****
1522 /COM,      * Temperature Profile from center to lower right (45 deg.) *
1523 /COM,      *****
1524 NSOL, 2,(NODE(TCO45, (-1.0*TCO45),0.0)),TEMP,,t04i045,
1525 NSOL, 3,(NODE(TCI45, (-1.0*TCI45),0.0)),TEMP,,t04o045,
1526 NSOL, 4,(NODE(HCI45, (-1.0*HCI45),0.0)),TEMP,,h04i045,
1527 NSOL, 5,(NODE(CCO45, (-1.0*CCO45),0.0)),TEMP,,c04i045,
1528 NSOL, 6,(NODE(HCO45, (-1.0*HCO45),0.0)),TEMP,,h04o045,
1529 NSOL, 7,(NODE(SCI45, (-1.0*SCI45),0.0)),TEMP,,s04i045,
1530 NSOL, 8,(NODE(SCO45, (-1.0*SCO45),0.0)),TEMP,,s04o045,
1531 NSOL, 9,(NODE(MI45, (-1.0*MI45),0.0)),TEMP,,i04i045,
1532 NSOL,10,(NODE(MO45, (-1.0*MO45),0.0)),TEMP,,i04o045,
1533 NSOL,11,(NODE(DO45, (-1.0*DO45),0.0)),TEMP,,o04o045,
1534 PRVAR, 2, 3, 4, 5, 6, 7,
1535 PRVAR, 8, 9,10,11,
1536 /COM,
1537 /COM,      *****
1538 /COM,      * Temperature Profile from center to upper right (135 deg.) *
1539 /COM,      *****
1540 NSOL, 2,(NODE(TCO45, TCO45,0.0)),TEMP,,t01i135,
1541 NSOL, 3,(NODE(TCI45, TCI45,0.0)),TEMP,,t01o135,
1542 NSOL, 4,(NODE(HCI45, HCI45,0.0)),TEMP,,h01i135,
1543 NSOL, 5,(NODE(CCO45, CCO45,0.0)),TEMP,,c01i135,
1544 NSOL, 6,(NODE(HCO45, HCO45,0.0)),TEMP,,h01o135,
1545 NSOL, 7,(NODE(SCI45, SCI45,0.0)),TEMP,,s01i135,
1546 NSOL, 8,(NODE(SCO45, SCO45,0.0)),TEMP,,s01o135,
1547 NSOL, 9,(NODE(MI45, MI45,0.0)),TEMP,,i01i135,
1548 NSOL,10,(NODE(MO45, MO45,0.0)),TEMP,,i01o135,
1549 NSOL,11,(NODE(DO45, DO45,0.0)),TEMP,,o01o135,
1550 PRVAR, 2, 3, 4, 5, 6, 7,
1551 PRVAR, 8, 9,10,11,
1552 /COM,
1553 /COM,      *****
1554 /COM,      * Temp. Prof. from center to lower right (45 deg.) z=glass bot *
1555 /COM,      *****
1556 NSOL, 2,(NODE(TCO45, (-1.0*TCO45),(-1*BTPT4))),TEMP,,tb4i045,
1557 NSOL, 3,(NODE(TCI45, (-1.0*TCI45),(-1*BTPT4))),TEMP,,tb4o045,
1558 NSOL, 4,(NODE(HCI45, (-1.0*HCI45),(-1*BTPT4))),TEMP,,hb4i045,

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1559 NSOL, 5, (NODE( CCO45, (-1.0*CCO45), (-1*BTPT4))), TEMP, ,cb4i045,
1560 NSOL, 6, (NODE( HCO45, (-1.0*HCO45), (-1*BTPT4))), TEMP, ,hb4o045,
1561 NSOL, 7, (NODE( SCI45, (-1.0*SCI45), (-1*BTPT4))), TEMP, ,sb4i045,
1562 NSOL, 8, (NODE( SCO45, (-1.0*SCO45), (-1*BTPT4))), TEMP, ,sb4o045,
1563 NSOL, 9, (NODE( MI45, (-1.0*MI45), (-1*BTPT4))), TEMP, ,ib4i045,
1564 NSOL, 10, (NODE( MO45, (-1.0*MO45), (-1*BTPT4))), TEMP, ,ib4o045,
1565 NSOL, 11, (NODE( DO45, (-1.0*DO45), (-1*BTPT4))), TEMP, ,ob4o045,
1566 PRVAR, 2, 3, 4, 5, 6, 7,
1567 PRVAR, 8, 9, 10, 11,
1568 /COM,
1569 /COM, *****
1570 /COM, * Temp. Prof. from center to upper right (135 deg.) z=glass bot*
1571 /COM, *****
1572 NSOL, 2, (NODE( TCO45, TCO45, (-1*BTPT4))), TEMP, ,t01i135,
1573 NSOL, 3, (NODE( TCI45, TCI45, (-1*BTPT4))), TEMP, ,t01o135,
1574 NSOL, 4, (NODE( HCI45, HCI45, (-1*BTPT4))), TEMP, ,h01i135,
1575 NSOL, 5, (NODE( CCO45, CCO45, (-1*BTPT4))), TEMP, ,c01i135,
1576 NSOL, 6, (NODE( HCO45, HCO45, (-1*BTPT4))), TEMP, ,h01o135,
1577 NSOL, 7, (NODE( SCI45, SCI45, (-1*BTPT4))), TEMP, ,s01i135,
1578 NSOL, 8, (NODE( SCO45, SCO45, (-1*BTPT4))), TEMP, ,s01o135,
1579 NSOL, 9, (NODE( MI45, MI45, (-1*BTPT4))), TEMP, ,i01i135,
1580 NSOL, 10, (NODE( MO45, MO45, (-1*BTPT4))), TEMP, ,i01o135,
1581 NSOL, 11, (NODE( DO45, DO45, (-1*BTPT4))), TEMP, ,o01o135,
1582 PRVAR, 2, 3, 4, 5, 6, 7,
1583 PRVAR, 8, 9, 10, 11,
1584 /COM,
1585 /COM, *****
1586 /COM, * Temp. Prof. from center to lower right (45 deg.) z=glass top *
1587 /COM, *****
1588 NSOL, 2, (NODE( TCO45, (-1.0*TCO45), TPPT6)), TEMP, ,tt4i045,
1589 NSOL, 3, (NODE( TCI45, (-1.0*TCI45), TPPT6)), TEMP, ,tt4o045,
1590 NSOL, 4, (NODE( HCI45, (-1.0*HCI45), TPPT6)), TEMP, ,ht4i045,
1591 NSOL, 5, (NODE( CCO45, (-1.0*CCO45), TPPT6)), TEMP, ,ct4i045,
1592 NSOL, 6, (NODE( HCO45, (-1.0*HCO45), TPPT6)), TEMP, ,ht4o045,
1593 NSOL, 7, (NODE( SCI45, (-1.0*SCI45), TPPT6)), TEMP, ,st4i045,
1594 NSOL, 8, (NODE( SCO45, (-1.0*SCO45), TPPT6)), TEMP, ,st4o045,
1595 NSOL, 9, (NODE( MI45, (-1.0*MI45), TPPT6)), TEMP, ,it4i045,
1596 NSOL, 10, (NODE( MO45, (-1.0*MO45), TPPT6)), TEMP, ,it4o045,
1597 NSOL, 11, (NODE( DO45, (-1.0*DO45), TPPT6)), TEMP, ,ot4o045,
1598 PRVAR, 2, 3, 4, 5, 6, 7,
1599 PRVAR, 8, 9, 10, 11,
1600 /COM,
1601 /COM, *****
1602 /COM, * Temp. Prof. from center to upper right (135 deg.) z=glass top*
1603 /COM, *****
1604 NSOL, 2, (NODE( TCO45, TCO45, TPPT6)), TEMP, ,t01i135,
1605 NSOL, 3, (NODE( TCI45, TCI45, TPPT6)), TEMP, ,t01o135,
1606 NSOL, 4, (NODE( HCI45, HCI45, TPPT6)), TEMP, ,h01i135,
1607 NSOL, 5, (NODE( CCO45, CCO45, TPPT6)), TEMP, ,c01i135,
1608 NSOL, 6, (NODE( HCO45, HCO45, TPPT6)), TEMP, ,h01o135,
1609 NSOL, 7, (NODE( SCI45, SCI45, TPPT6)), TEMP, ,s01i135,
1610 NSOL, 8, (NODE( SCO45, SCO45, TPPT6)), TEMP, ,s01o135,
1611 NSOL, 9, (NODE( MI45, MI45, TPPT6)), TEMP, ,i01i135,
1612 NSOL, 10, (NODE( MO45, MO45, TPPT6)), TEMP, ,i01o135,
1613 NSOL, 11, (NODE( DO45, DO45, TPPT6)), TEMP, ,o01o135,
1614 PRVAR, 2, 3, 4, 5, 6, 7,
1615 PRVAR, 8, 9, 10, 11,
1616 /COM,
1617 /COM, *****
1618 /COM, * Can. Center Line Temperature Profile in Quad 1 WP Top to Bot *
1619 /COM, *****
1620 NSOL, 2, (NODE( CCO45, CCO45, MIDPT)), TEMP, ,ot1o135,
1621 NSOL, 3, (NODE( CCO45, CCO45, TPPT1)), TEMP, ,ot1i135,
1622 NSOL, 4, (NODE( CCO45, CCO45, TPPT2)), TEMP, ,it1o135,
1623 NSOL, 5, (NODE( CCO45, CCO45, TPPT3)), TEMP, ,it1i135,
1624 NSOL, 6, (NODE( CCO45, CCO45, TPPT4)), TEMP, ,st1o135,
1625 NSOL, 7, (NODE( CCO45, CCO45, TPPT5)), TEMP, ,st1i135,
1626 NSOL, 8, (NODE( CCO45, CCO45, TPPT6)), TEMP, ,ht1i135,
1627 NSOL, 9, (NODE( CCO45, CCO45, ( 0.5*TPPT6))), TEMP, ,gt1i135,
1628 NSOL, 10, (NODE( CCO45, CCO45, 0.0)), TEMP, ,c01i135,

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1629 NSOL,11,(NODE( CCO45, CCO45, (-0.33*BTPT4))),TEMP,,gb1i135,
1630 NSOL,12,(NODE( CCO45, CCO45, (-0.66*BTPT4))),TEMP,,gb1h135,
1631 NSOL,13,(NODE( CCO45, CCO45, (-1.0*BTPT4))),TEMP,,sb1i135,
1632 NSOL,14,(NODE( CCO45, CCO45, (-1.0*BTPT3))),TEMP,,sb1o135,
1633 NSOL,15,(NODE( CCO45, CCO45, (-1.0*BTPT2))),TEMP,,ib1i135,
1634 NSOL,16,(NODE( CCO45, CCO45, (-1.0*BTPT1))),TEMP,,ib1o135,
1635 NSOL,17,(NODE( CCO45, CCO45, MIDPT)),TEMP,,ob1o135,
1636 PRVAR, 2, 3, 4, 5, 6, 7,
1637 PRVAR, 8, 9,10,11,12,13,
1638 PRVAR,14,15,16,17,
1639 /COM,
1640 /COM,
1641 /COM, * Can. Center Line Temperature Profile in Quad 4 WP Top to Bot *
1642 /COM,
1643 NSOL, 2,(NODE( CCO45,(-1.0*CCO45), MIDPT)),TEMP,,ot4o045,
1644 NSOL, 3,(NODE( CCO45,(-1.0*CCO45), TPPT1)),TEMP,,ot4i045,
1645 NSOL, 4,(NODE( CCO45,(-1.0*CCO45), TPPT2)),TEMP,,it4o045,
1646 NSOL, 5,(NODE( CCO45,(-1.0*CCO45), TPPT3)),TEMP,,it4i045,
1647 NSOL, 6,(NODE( CCO45,(-1.0*CCO45), TPPT4)),TEMP,,st4o045,
1648 NSOL, 7,(NODE( CCO45,(-1.0*CCO45), TPPT5)),TEMP,,st4i045,
1649 NSOL, 8,(NODE( CCO45,(-1.0*CCO45), TPPT6)),TEMP,,ht4i045,
1650 NSOL, 9,(NODE( CCO45,(-1.0*CCO45), ( 0.5*TPPT6))),TEMP,,gt4i045,
1651 NSOL,10,(NODE( CCO45,(-1.0*CCO45), 0.0)),TEMP,,c04i045,
1652 NSOL,11,(NODE( CCO45,(-1.0*CCO45), (-0.33*BTPT4))),TEMP,,gb4i045,
1653 NSOL,12,(NODE( CCO45,(-1.0*CCO45), (-0.66*BTPT4))),TEMP,,gb4h045,
1654 NSOL,13,(NODE( CCO45,(-1.0*CCO45), (-1.0*BTPT4))),TEMP,,sb4i045,
1655 NSOL,14,(NODE( CCO45,(-1.0*CCO45), (-1.0*BTPT3))),TEMP,,sb4o045,
1656 NSOL,15,(NODE( CCO45,(-1.0*CCO45), (-1.0*BTPT2))),TEMP,,ib4i045,
1657 NSOL,16,(NODE( CCO45,(-1.0*CCO45), (-1.0*BTPT1))),TEMP,,ib4o045,
1658 NSOL,17,(NODE( CCO45,(-1.0*CCO45), MIDPT)),TEMP,,ob4o045,
1659 PRVAR, 2, 3, 4, 5, 6, 7,
1660 PRVAR, 8, 9,10,11,12,13,
1661 PRVAR,14,15,16,17,
1662 /COM,
1663 /COM,
1664 /COM, * Can. Inner Surface Temperature Prof. in Quad 1 WP Top - Bot *
1665 /COM,
1666 NSOL, 2,(NODE( TCO45, TCO45, MIDPT)),TEMP,,ot1oise,
1667 NSOL, 3,(NODE( TCO45, TCO45, TPPT1)),TEMP,,ot1iise,
1668 NSOL, 4,(NODE( TCO45, TCO45, TPPT2)),TEMP,,it1oise,
1669 NSOL, 5,(NODE( TCO45, TCO45, TPPT3)),TEMP,,it1iise,
1670 NSOL, 6,(NODE( TCO45, TCO45, TPPT4)),TEMP,,st1oise,
1671 NSOL, 7,(NODE( TCO45, TCO45, TPPT5)),TEMP,,st1iise,
1672 NSOL, 8,(NODE( TCO45, TCO45, TPPT6)),TEMP,,ht1iise,
1673 NSOL, 9,(NODE( TCO45, TCO45, ( 0.5*TPPT6))),TEMP,,gt1iise,
1674 NSOL,10,(NODE( TCO45, TCO45, 0.0)),TEMP,,c01iise,
1675 NSOL,11,(NODE( TCO45, TCO45, (-0.33*BTPT4))),TEMP,,gb1iise,
1676 NSOL,12,(NODE( TCO45, TCO45, (-0.66*BTPT4))),TEMP,,gb1hise,
1677 NSOL,13,(NODE( TCO45, TCO45, (-1.0*BTPT4))),TEMP,,sb1iise,
1678 NSOL,14,(NODE( TCO45, TCO45, (-1.0*BTPT3))),TEMP,,sb1oise,
1679 NSOL,15,(NODE( TCO45, TCO45, (-1.0*BTPT2))),TEMP,,ib1iise,
1680 NSOL,16,(NODE( TCO45, TCO45, (-1.0*BTPT1))),TEMP,,ib1oise,
1681 NSOL,17,(NODE( TCO45, TCO45, MIDPT)),TEMP,,ob1oise,
1682 PRVAR, 2, 3, 4, 5, 6, 7,
1683 PRVAR, 8, 9,10,11,12,13,
1684 PRVAR,14,15,16,17,
1685 /COM,
1686 /COM,
1687 /COM, * Can. Outer Surface Temperature Prof. in Quad 1 WP Top - Bot *
1688 /COM,
1689 NSOL, 2,(NODE( SCO45, SCO45, MIDPT)),TEMP,,ot1oose,
1690 NSOL, 3,(NODE( SCO45, SCO45, TPPT1)),TEMP,,ot1iise,
1691 NSOL, 4,(NODE( SCO45, SCO45, TPPT2)),TEMP,,it1oose,
1692 NSOL, 5,(NODE( SCO45, SCO45, TPPT3)),TEMP,,it1iise,
1693 NSOL, 6,(NODE( SCO45, SCO45, TPPT4)),TEMP,,st1oose,
1694 NSOL, 7,(NODE( SCO45, SCO45, TPPT5)),TEMP,,st1iise,
1695 NSOL, 8,(NODE( SCO45, SCO45, TPPT6)),TEMP,,ht1iise,
1696 NSOL, 9,(NODE( SCO45, SCO45, ( 0.5*TPPT6))),TEMP,,gt1iise,
1697 NSOL,10,(NODE( SCO45, SCO45, 0.0)),TEMP,,c01iise,
1698 NSOL,11,(NODE( SCO45, SCO45, (-0.33*BTPT4))),TEMP,,gb1iise,

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1699 NSOL,12,(NODE( SC045, SC045, (-0.66*BTPT4))),TEMP,,gb1hose,
1700 NSOL,13,(NODE( SC045, SC045, (-1.0*BTPT4))),TEMP,,sb1iose,
1701 NSOL,14,(NODE( SC045, SC045, (-1.0*BTPT3))),TEMP,,sb1oose,
1702 NSOL,15,(NODE( SC045, SC045, (-1.0*BTPT2))),TEMP,,ib1iose,
1703 NSOL,16,(NODE( SC045, SC045, (-1.0*BTPT1))),TEMP,,ib1oose,
1704 NSOL,17,(NODE( SC045, SC045, MIDPT)),TEMP,,ob1oose,
1705 PRVAR, 2, 3, 4, 5, 6, 7,
1706 PRVAR, 8, 9,10,11,12,13,
1707 PRVAR,14,15,16,17,
1708 /COM,
1709 /COM,
1710 /COM, * Can. Inner Surface Temperature Prof. in Quad 4 WP Top - Bot *
1711 /COM,
1712 NSOL, 2,(NODE( TCO45,(-1.0*TCO45), MIDPT)),TEMP,,ot4oise,
1713 NSOL, 3,(NODE( TCO45,(-1.0*TCO45), TPPT1)),TEMP,,ot4iise,
1714 NSOL, 4,(NODE( TCO45,(-1.0*TCO45), TPPT2)),TEMP,,it4oise,
1715 NSOL, 5,(NODE( TCO45,(-1.0*TCO45), TPPT3)),TEMP,,it4iise,
1716 NSOL, 6,(NODE( TCO45,(-1.0*TCO45), TPPT4)),TEMP,,st4oise,
1717 NSOL, 7,(NODE( TCO45,(-1.0*TCO45), TPPT5)),TEMP,,st4iise,
1718 NSOL, 8,(NODE( TCO45,(-1.0*TCO45), TPPT6)),TEMP,,ht4iise,
1719 NSOL, 9,(NODE( TCO45,(-1.0*TCO45), ( 0.5*TPPT6))),TEMP,,gt4iise,
1720 NSOL,10,(NODE( TCO45,(-1.0*TCO45), 0.0)),TEMP,,c04iise,
1721 NSOL,11,(NODE( TCO45,(-1.0*TCO45), (-0.33*BTPT4))),TEMP,,gb4iise,
1722 NSOL,12,(NODE( TCO45,(-1.0*TCO45), (-0.66*BTPT4))),TEMP,,gb4hise,
1723 NSOL,13,(NODE( TCO45,(-1.0*TCO45), (-1.0*BTPT4))),TEMP,,sb4iise,
1724 NSOL,14,(NODE( TCO45,(-1.0*TCO45), (-1.0*BTPT3))),TEMP,,sb4oise,
1725 NSOL,15,(NODE( TCO45,(-1.0*TCO45), (-1.0*BTPT2))),TEMP,,ib4iise,
1726 NSOL,16,(NODE( TCO45,(-1.0*TCO45), (-1.0*BTPT1))),TEMP,,ib4oise,
1727 NSOL,17,(NODE( TCO45,(-1.0*TCO45), MIDPT)),TEMP,,ob4oise,
1728 PRVAR, 2, 3, 4, 5, 6, 7,
1729 PRVAR, 8, 9,10,11,12,13,
1730 PRVAR,14,15,16,17,
1731 /COM,
1732 /COM,
1733 /COM, * Can. Outer Surface Temperature Prof. in Quad 4 WP Top - Bot *
1734 /COM,
1735 NSOL, 2,(NODE( SC045,(-1.0*SC045), MIDPT)),TEMP,,ot4oose,
1736 NSOL, 3,(NODE( SC045,(-1.0*SC045), TPPT1)),TEMP,,ot4ioise,
1737 NSOL, 4,(NODE( SC045,(-1.0*SC045), TPPT2)),TEMP,,it4oose,
1738 NSOL, 5,(NODE( SC045,(-1.0*SC045), TPPT3)),TEMP,,it4ioise,
1739 NSOL, 6,(NODE( SC045,(-1.0*SC045), TPPT4)),TEMP,,st4oose,
1740 NSOL, 7,(NODE( SC045,(-1.0*SC045), TPPT5)),TEMP,,st4ioise,
1741 NSOL, 8,(NODE( SC045,(-1.0*SC045), TPPT6)),TEMP,,ht4ioise,
1742 NSOL, 9,(NODE( SC045,(-1.0*SC045), ( 0.5*TPPT6))),TEMP,,gt4ioise,
1743 NSOL,10,(NODE( SC045,(-1.0*SC045), 0.0)),TEMP,,c04ioise,
1744 NSOL,11,(NODE( SC045,(-1.0*SC045), (-0.33*BTPT4))),TEMP,,gb4ioise,
1745 NSOL,12,(NODE( SC045,(-1.0*SC045), (-0.66*BTPT4))),TEMP,,gb4hose,
1746 NSOL,13,(NODE( SC045,(-1.0*SC045), (-1.0*BTPT4))),TEMP,,sb4ioise,
1747 NSOL,14,(NODE( SC045,(-1.0*SC045), (-1.0*BTPT3))),TEMP,,sb4oose,
1748 NSOL,15,(NODE( SC045,(-1.0*SC045), (-1.0*BTPT2))),TEMP,,ib4ioise,
1749 NSOL,16,(NODE( SC045,(-1.0*SC045), (-1.0*BTPT1))),TEMP,,ib4oose,
1750 NSOL,17,(NODE( SC045,(-1.0*SC045), MIDPT)),TEMP,,ob4oose,
1751 PRVAR, 2, 3, 4, 5, 6, 7,
1752 PRVAR, 8, 9,10,11,12,13,
1753 PRVAR,14,15,16,17,
1754 /COM,
1755 /COM,
1756 /COM, * WP Outer Surface Temperature Prof. at 90 deg. WP Top - Bot *
1757 /COM,
1758 NSOL, 2,(NODE( DCORD,0.0, MIDPT)),TEMP,,otwoose,
1759 NSOL, 3,(NODE( DCORD,0.0, TPPT1)),TEMP,,otwiise,
1760 NSOL, 4,(NODE( DCORD,0.0, TPPT2)),TEMP,,itwoose,
1761 NSOL, 5,(NODE( DCORD,0.0, TPPT3)),TEMP,,itwiise,
1762 NSOL, 6,(NODE( DCORD,0.0, TPPT4)),TEMP,,stwoose,
1763 NSOL, 7,(NODE( DCORD,0.0, TPPT5)),TEMP,,stwiise,
1764 NSOL, 8,(NODE( DCORD,0.0, TPPT6)),TEMP,,htwiise,
1765 NSOL, 9,(NODE( DCORD,0.0, ( 0.5*TPPT6))),TEMP,,gtwiise,
1766 NSOL,10,(NODE( DCORD,0.0, 0.0)),TEMP,,c0wiise,
1767 NSOL,11,(NODE( DCORD,0.0, (-0.33*BTPT4))),TEMP,,gbwiise,
1768 NSOL,12,(NODE( DCORD,0.0, (-0.66*BTPT4))),TEMP,,gbwoose,

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1769 NSOL,13,(NODE( DCORD,0.0, (-1.0*BTPT4))),TEMP,,sbwiose,
1770 NSOL,14,(NODE( DCORD,0.0, (-1.0*BTPT3))),TEMP,,sbwoose,
1771 NSOL,15,(NODE( DCORD,0.0, (-1.0*BTPT2))),TEMP,,ibwiose,
1772 NSOL,16,(NODE( DCORD,0.0, (-1.0*BTPT1))),TEMP,,ibwoose,
1773 NSOL,17,(NODE( DCORD,0.0, MIDPT)),TEMP,,obwoose,
1774 PRVAR, 2, 3, 4, 5, 6, 7,
1775 PRVAR, 8, 9,10,11,12,13,
1776 PRVAR,14,15,16,17,
1777 FINISH
1778 /COM, *****
1779 /COM, End of batch input file
1780 /COM, *****
1781 SAVE,
1782 /EXIT,
1783 /EOF

```

RUN SETUP PROCEDURE FROM FILE= /ansys50a/docu/start.ans

```

/INPUT FILE= /ansys50a/docu/start.ans LINE= 0
*****
ANSYS STARTUP FILE start.ans
*****

```

```

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= INP     /input,,inp,
ABBREVIATION= X3D     /show,3d,
ABBREVIATION= X11     /show,x11,
ABBREVIATION= VEC     /show,,,1,

```

ABBREVIATION= RAS /show,,,0,
 ABBREVIATION= ON /menu,on,
 ABBREVIATION= OFF /menu,off,
 ABBREVIATION= NVP /config,nvpag,512,
 ABBREVIATION= QUIT /exit,nosav,
 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

type: on

 ANSYS REVISION 5.0A 06/09/1995
 3-D Model of Pu Disp. Glass WP for MGDS Disposal Thomas L Lotz

 * *
 * File name: pugls2x.inp *
 * 4 Pack Glass WP Form w/ C71500 Outer Barrier D. Container *
 * No Helium Fill Gas - WP placed at mid point between SNF WP *
 * *
 * Material Property file: propsd1.dat *
 * *
 * SNF Conductivity file: TBD (NOT REQUIRED) *
 * *
 * *
 * SNF Heat Loads file: pugls3.dat *
 * Initial Heat Load: 681 W/canister *
 * *
 * Surface Temp. file: c21x5a.parm *
 * 100 MTU/acre (24.7 kgU/m²) AML (High Thermal Loading) *
 * 5.0 m Diameter Drift with Concrete Invert *
 * Drift spacing = 22.5 m *
 * WP c/c spacing = 16.165 m *
 * *

 Increase the number of database pages from 16 (256) to 32 Mb
 DONT DO: /CONFIG,nvpag,512,
 Work space must also be increased (-m 87) For Radiation Matix

TITLE=

DHLW Glass Form Waste Package

SI UNITS SPECIFIED

LENGTH = METERS(M)
 MASS = KILOGRAMS(KG)
 TIME = SECONDS(SEC)
 TEMPERATURE = CENTIGRADE
 CURRENT = AMPS

 Read in average effective conductivities from SNF model
 No Need for File: PARRES,CHANGE,pwr15e,parm,
 Read in surface temps. from repository model

*** NOTE *** CP= .590 TIME= 16:51:44
Restore ANSYS parameters from file= c21x5a.parm.

/INPUT FILE= c21x5a.parm LINE= 0

PRINTOUT RESUMED BY /GOP

Define Transient time parameters (AS PER THE PARAM. FILE)

TM_START = start time (sec)

TMI* = time increment for solution (sec)

TME* = start and stop for time do-loops (sec)

Note: 1 year = 3.15576e7 seconds

TMTMAX = time of maximum cladding temperature

TM_START=(1.0E-6)*(3.15576E7)

TMI0=0.1*3.15576E7

TMI1=1.0*3.15576E7

TMI10=10.0*3.15576E7

TMI100=100.0*3.15576E7

TMI1000=1000.0*3.15576E7

TME0=0.9*3.15576E7+TM_START

TME1=TMI1+TM_START

TME9=9.0*3.15576E7+TM_START

TME10=TMI10+TM_START

TME50=50.0*3.15576E7+TM_START

TME90=90.0*3.15576E7+TM_START

TME100=TMI100+TM_START

TME1000=TMI1000+TM_START

Define waste package parameters

Required Constants:

PARAMETER PI = 3.141593

PARAMETER SQT = 1.414214

Define emplacement parameters

DFRAD = radius of drift (m)

INVRT = height of invert backfill floor (m)

WSPC = waste package c/c spacing (m)

OFFST = WP center below drift center (m)

XXX = X coordinate of invert drift wall intersection

YYY = Y coordinate of invert drift wall intersection

PARAMETER DFRAD = 2.500000

PARAMETER INVRT = .7000000

PARAMETER WSPC = 16.16500

PARAMETER OFFST = .1833000

PARAMETER XXX = 1.734935

PARAMETER YYY = -1.616700

Required container wall parameters:

DCIRD = disposal container inner radius (m)

OWALL = outer barrier thickness (m)

IWALL = inner barrier thickness (m)

DCORD = disposal container outer radius (m)

DCLEN = Disp. Cont. outside length

DCOLT = Disp. Cont. Outer Lid Thickness (m)

DCILT = Disp. Cont. Inner Lid Thickness (m)

DCIOG = Disp. Cont. Inner/Outer Lid Gap at top of WP (m)

DCILN = Disp. Cont. Inner Bar. Total length (m)

DCILI = Disp. Cont. Inner Bar. Inner length (m)

PARAMETER DCIRD = .7845000

PARAMETER OWALL = .5000000E-01
 PARAMETER IWALL = .2000000E-01
 PARAMETER DCORD = .8545000
 PARAMETER DCLEN = 3.230000
 PARAMETER DCOLT = .5500000E-01
 PARAMETER DCILT = .2500000E-01
 PARAMETER DCIOG = .3000000E-01
 PARAMETER DCILN = 3.090000
 PARAMETER DCILI = 3.040000

Required ceramic and drum parameters:

CDRAD = glass radius (m)
 CDHGT = glass hieght; hieght of fill (m)
 DRMIR = SRP Canister inner rad. (m)
 DRMOR = SRP Canister drum outer rad. (m)
 DRBTT = SRP Canister thickness at bottom of Canister (m)
 DRTPT = SRP Canister thickness at Top of Canister (m)
 DRLEN = SRP Canister outer length (m)
 DRILN = SRP Canister Inner length (m)
 DRGAP = SRP Canister axial gap with inner barrier at bot
 DRGPT = SRP Canister axial gap with inner barrier at top
 DRMOF = SRP Canister center line off set (m)
 PEAKF = Peaking factor to adjust Heat generation dist.
 FVOLL = can_volume=PI*glass_fill_radiu^2*glass_length

PARAMETER CDRAD = .2953000
 PARAMETER CDHGT = 2.154900
 PARAMETER DRMIR = .2953000
 PARAMETER DRMOR = .3048000
 PARAMETER DRBTT = .1500000E-01
 PARAMETER DRTPT = .2000000E-01
 PARAMETER DRLEN = 2.744600
 PARAMETER DRILN = 2.709600
 PARAMETER DRGAP = .2500000E-01
 PARAMETER DRGPT = .2704000
 PARAMETER DRMOF = .2015054E-01
 PARAMETER PEAKF = 1.000000
 PARAMETER FVOLL = .5903423

Define Extrude Distances as required:
 Bottom of WP

PARAMETER MIDPT = 1.615000
 PARAMETER BTPT1 = 1.560000
 PARAMETER BTPT2 = 1.535000
 PARAMETER BTPT3 = 1.510000

PARAMETER BTPT4 = 1.495000
Top of WP
PARAMETER TPPT1 = 1.560000
PARAMETER TPPT2 = 1.530000
PARAMETER TPPT3 = 1.505000
PARAMETER TPPT4 = 1.234600
PARAMETER TPPT5 = 1.214600
PARAMETER TPPT6 = .6599000

Define calculated parameters

ASSY = assembly heat production (W) f(yrs)

FUEL = volumetric heat production (W/m3) f(yrs)

ARRAY PARAMETER ASSY DELETED.

SET PARAMETER DIMENSIONS ON ASSY TYPE=TABL DIMENSIONS= 101 1 1

SET PARAMETER DIMENSIONS ON FUEL TYPE=TABL DIMENSIONS= 101 1 1

Define 45 degree point of reference:

TC045 = x coord. WP Center Line Outer Pour Can. at 45 de

TCI45 = x coord. WP Center Line Inner Pour Can. at 45 de

HCI45 = x coord. WP Center Line side of center Glass at

HCO45 = x coord. WP Edge side of center Glass at 45 deg.

CCO45 = x coord. Glass Center Line in Pour Can. at 45 de

SCO45 = x coord. WP Edge Outer Pour Can. at 45 deg.

SCI45 = x coord. WP Edge Inner Pour Can. at 45 deg.

MI45 = x coord. DCIRD at 45 deg.

MO45 = x coord. DCIRD+IWALL at 45 deg.

DO45 = x coord. DCIRD+IWALL+OWALL at 45 deg.

PARAMETER TC045 = .1094244
PARAMETER TCI45 = .1161419
PARAMETER HCI45 = .2205462
PARAMETER HCO45 = .4293549
PARAMETER CCO45 = .3249505
PARAMETER SCO45 = .5404767
PARAMETER SCI45 = .5337592
PARAMETER MI45 = .5547253
PARAMETER MO45 = .5688674
PARAMETER DO45 = .6042227

Define different element types

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 16:51:45 OCT 27, 1995 CP= 1.350
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

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

ELEMENT TYPE 1 IS PLANE55 2-D THERMAL SOLID
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
TWO-DIMENSIONAL MODEL

ELEMENT TYPE 2 IS SOLID70 3-D THERMAL SOLID
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 6 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 7 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 11 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 16 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 17 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 18 IS MATRIX50 SUBSTRUCTURE MATRIX
KEYOPT(1-12)= 1 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 19 IS LINK31 RADIATION LINK
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 26 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 27 IS LINK32 2-D CONDUCTING BAR
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 36 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

ELEMENT TYPE 46 IS SHELL57 THERMAL SHELL
KEYOPT(1-12)= 0 0 0 0 0 0 0 0 0 0 0 0

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

File props01.dat describes material properties
and thier reference numbers

READ IN MATERIAL PROPERTY LIBRARY FROM FILE= propsd1.dat

/INPUT FILE= propsd1.dat LINE= 0

** ANSYS 5.0 MPC MATERIAL PROPERTY TABLES **

** Filename: propsd1.dat **
** Compiled by T. Lotz on 4-17-95 **

NUMBER	MATERIAL	DESCRIPTION
1	Stainless Steel 316	Pour Canister Material
2	Incaloy 825	Inner Container (resistant)
3	A516 Mild Steel	Outer Container (allowance)
4	Concrete	Concrete used for invert; Track Bed
5	Glass (Pyrex)	Boro-Silicate Glass form
6	TSw2	Drift Wall - Repository Horizon
7	Helium	Canister Fill Gas
8	Air	Alternate Fill Gas
9	Nitrogen	Alternate Fill Gas
10	Argon	Alternate Fill Gas
11	Aluminum 6063	Thermal Conductor
12	Copper	Alternate Thermal Conductor
13	Aluminum-Boron	Aluminum Boron Criticality Matl

** Density: DENS (kg/m^3) **
** Emissivity EMIS **
** Conductivity: KXX (W/m/K) **
** Specific Heat: C (J/kg/K) **

Define densities for all materials except gases
Density of rock (6) is 1.0 because
heat capacitances (J/m^3/K) are entered for C

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 1 ***
SLOC= 1 .0000000E+00

PROPERTY TABLE DENS MAT= 1 NUM. POINTS= 1
SLOC= 1 8000.000

PROPERTY TABLE DENS MAT= 2 NUM. POINTS= 1
SLOC= 1 8137.900

PROPERTY TABLE DENS MAT= 3 NUM. POINTS= 1
SLOC= 1 8131.000

PROPERTY TABLE DENS MAT= 4 NUM. POINTS= 1
SLOC= 1 2300.000

PROPERTY TABLE DENS MAT= 5 NUM. POINTS= 1

SLOC= 1 2225.000

PROPERTY TABLE DENS MAT= 6 NUM. POINTS= 1
SLOC= 1 1.000000

PROPERTY TABLE DENS MAT= 11 NUM. POINTS= 1
SLOC= 1 2690.000

PROPERTY TABLE DENS MAT= 12 NUM. POINTS= 1
SLOC= 1 8933.000

PROPERTY TABLE DENS MAT= 13 NUM. POINTS= 1
SLOC= 1 2693.000

Define emissivities for all materials except gases

PROPERTY TABLE EMIS MAT= 1 NUM. POINTS= 1
SLOC= 1 .6000000

PROPERTY TABLE EMIS MAT= 2 NUM. POINTS= 1
SLOC= 1 .8000000

PROPERTY TABLE EMIS MAT= 3 NUM. POINTS= 1
SLOC= 1 .8000000

PROPERTY TABLE EMIS MAT= 4 NUM. POINTS= 1
SLOC= 1 .8800000

PROPERTY TABLE EMIS MAT= 5 NUM. POINTS= 1
SLOC= 1 .8100000

PROPERTY TABLE EMIS MAT= 6 NUM. POINTS= 1
SLOC= 1 .8500000

PROPERTY TABLE EMIS MAT= 11 NUM. POINTS= 1
SLOC= 1 .7000000E-01

PROPERTY TABLE EMIS MAT= 12 NUM. POINTS= 1
SLOC= 1 .5000000

PROPERTY TABLE EMIS MAT= 13 NUM. POINTS= 1
SLOC= 1 .7000000E-01

Define specific heat for matl. 4, 5, 7, 11, 14, 15

PROPERTY TABLE C MAT= 4 NUM. POINTS= 1
SLOC= 1 880.0000

PROPERTY TABLE C MAT= 5 NUM. POINTS= 1
SLOC= 1 835.0000

PROPERTY TABLE C MAT= 7 NUM. POINTS= 1
SLOC= 1 5193.000

PROPERTY TABLE C MAT= 11 NUM. POINTS= 1
SLOC= 1 900.0000

Define K for material 4, 5, and 6

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 1
SLOC= 1 1.400000

PROPERTY TABLE KXX MAT= 5 NUM. POINTS= 1
SLOC= 1 1.100000

PROPERTY TABLE KXX MAT= 6 NUM. POINTS= 1
SLOC= 1 2.100000

Define K and C for materials 1, 3

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 21.11000 37.78000 65.56000
 93.33000 121.1100 148.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
 SLOC= 7 176.6700 204.4400 232.2200
 260.0000 287.7800 315.5600

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 18 ***
 SLOC= 13 343.3300 371.1100 398.8900
 426.6700 454.4400 482.2200

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 24 ***
 SLOC= 19 510.0000 537.7800 565.5600
 593.3300 621.1100 648.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 30 ***
 SLOC= 25 676.6700 704.4400 732.2200
 760.0000 787.7800 815.5600

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 6
 SLOC= 1 13.33000 13.67000 14.19000 14.54000
 15.06000 15.58000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 12
 SLOC= 7 15.92000 16.44000 16.96000 17.31000
 17.83000 18.17000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 18
 SLOC= 13 18.52000 19.04000 19.38000 19.90000
 20.25000 20.77000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 24
 SLOC= 19 21.11000 21.46000 21.98000 22.33000
 22.67000 23.02000

PROPERTY TABLE KXX MAT= 1 NUM. POINTS= 30
 SLOC= 25 23.54000 23.88000 24.23000 24.58000
 24.92000 25.27000

PROPERTY TABLE C MAT= 1 NUM. POINTS= 6
 SLOC= 1 481.6800 486.9200 498.0900 499.3800
 509.9800 520.2900

PROPERTY TABLE C MAT= 1 NUM. POINTS= 12
 SLOC= 7 521.0700 527.3800 536.9200 537.3400
 543.0200 543.3100

PROPERTY TABLE C MAT= 1 NUM. POINTS= 18
 SLOC= 13 546.9100 552.1400 552.2600 557.2200
 557.2500 565.1100

PROPERTY TABLE C MAT= 1 NUM. POINTS= 24
 SLOC= 19 565.0100 564.9100 572.3500 572.1400
 574.9200 574.6800

PROPERTY TABLE C MAT= 1 NUM. POINTS= 30
 SLOC= 25 581.6400 581.3000 583.8600 586.3600
 585.9600 588.3900

PROPERTY TABLE KXX MAT= 3 NUM. POINTS= 6
 SLOC= 1 40.84000 41.36000 41.88000 42.23000
 42.23000 42.23000

PROPERTY TABLE KXX MAT= 3 NUM. POINTS= 12
 SLOC= 7 42.06000 41.88000 41.36000 41.02000
 40.50000 39.98000

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	18	
SLOC= 13	39.29000	38.77000	38.08000		37.56000
	36.69000	36.17000			

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	24	
SLOC= 19	35.48000	34.61000	33.92000		33.23000
	32.36000	31.50000			

PROPERTY TABLE KXX	MAT=	3	NUM. POINTS=	30	
SLOC= 25	30.29000	28.90000	27.35000		26.48000
	26.13000	26.13000			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	6	
SLOC= 1	428.7200	444.9500	460.9400		476.8700
	486.0800	495.6600			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	12	
SLOC= 7	506.0900	517.0700	525.6400		536.9900
	543.6300	550.6200			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	18	
SLOC= 13	562.2100	577.3200	589.1000		600.5700
	611.3500	629.0900			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	24	
SLOC= 19	645.3200	665.1200	682.0700		694.5200
	724.0700	761.9500			

PROPERTY TABLE C	MAT=	3	NUM. POINTS=	30	
SLOC= 25	806.3100	888.6000	1095.040		1638.780
	808.6800	736.9000			

Define K for material 2

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	6 ***
SLOC= 1	93.33000	121.1100 148.8900
	176.6700	204.4400 232.2200

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	12 ***
SLOC= 7	260.0000	287.7800 315.5600
	343.3300	371.1100 398.8900

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	18 ***
SLOC= 13	426.6700	454.4400 482.2200
	510.0000	537.7800 565.5600

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	24 ***
SLOC= 19	593.3300	621.1100 648.8900
	676.6700	704.4400 732.2200

*** PROPERTY TEMPERATURE TABLE	NUM. TEMPS=	27 ***
SLOC= 25	760.0000	787.7800 815.5600

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	6	
SLOC= 1	12.29000	12.63000	13.15000		13.67000
	14.02000	14.54000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	12	
SLOC= 7	14.88000	15.40000	15.75000		16.10000
	16.61000	16.96000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	18	
SLOC= 13	17.31000	17.65000	18.00000		18.52000
	18.86000	19.21000			

PROPERTY TABLE KXX	MAT=	2	NUM. POINTS=	24	
SLOC= 19	19.73000	20.08000	20.42000		20.94000

21.46000 21.98000

PROPERTY TABLE KXX MAT= 2 NUM. POINTS= 27
SLOC= 25 22.33000 23.02000 23.54000

Define C for material 2

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
SLOC= 1 93.33000 121.1100 148.8900
176.6700 204.4400 232.2200

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
SLOC= 7 260.0000 287.7800 315.5600
343.3300 371.1100 398.8900

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 17 ***
SLOC= 13 426.6700 454.4400 482.2200
510.0000 537.7800

PROPERTY TABLE C MAT= 2 NUM. POINTS= 6
SLOC= 1 460.6900 477.4200 501.0200 504.6500
498.1200 520.4500

PROPERTY TABLE C MAT= 2 NUM. POINTS= 12
SLOC= 7 536.8800 559.8500 576.8300 576.2100
581.6800 598.2000

PROPERTY TABLE C MAT= 2 NUM. POINTS= 17
SLOC= 13 619.5800 636.7600 654.2000 678.2500
696.2900

Define C for material 6

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 4 ***
SLOC= 1 25.00000 50.00000 94.00000
95.00000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 8 ***
SLOC= 5 105.0000 114.0000 115.0000
155.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 11 ***
SLOC= 9 195.0000 235.0000 275.0000

PROPERTY TABLE C MAT= 6 NUM. POINTS= 4
SLOC= 1 2032400. 2128000. 2263800. .1076380E+08

PROPERTY TABLE C MAT= 6 NUM. POINTS= 8
SLOC= 5 .1046900E+08 .1019840E+08 2006500. 2111400.

PROPERTY TABLE C MAT= 6 NUM. POINTS= 11
SLOC= 9 2191200. 2269200. 2341000.

Define p, K, C for materials 7, 8, 9, ~10

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
SLOC= 1 -13.15000 6.850000 26.85000
76.85000 126.8500 176.8500

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***
SLOC= 7 226.8500 276.8500 326.8500

376.8500 426.8500 476.8500

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 15 ***

SLOC= 13 526.8500 626.8500 726.8500

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 6
 SLOC= 1 .1875000 .1750000 .1625000 .1422000
 .1219000 .1097000

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 12
 SLOC= 7 .9750000E-01 .9060000E-01 .8360000E-01 .7670000E-01
 .6970000E-01 .6620000E-01

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 15
 SLOC= 13 .6270000E-01 .5580000E-01 .4880000E-01

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 6
 SLOC= 1 .1370000 .1450000 .1520000 .1700000
 .1870000 .2040000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 12
 SLOC= 7 .2200000 .2360000 .2520000 .2640000
 .2780000 .2910000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 15
 SLOC= 13 .3040000 .3300000 .3540000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 6
 SLOC= 1 1.348000 1.254700 1.161400 .9950000
 .8711000 .7740000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 12
 SLOC= 7 .6964000 .6329000 .5804000 .5356000
 .4975000 .4643000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 15
 SLOC= 13 .4354000 .3868000 .3482000

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 6
 SLOC= 1 .2300000E-01 .2500000E-01 .2600000E-01 .3000000E-01
 .3400000E-01 .3700000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 12
 SLOC= 7 .4100000E-01 .4400000E-01 .4700000E-01 .5000000E-01
 .5200000E-01 .5500000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 15
 SLOC= 13 .5700000E-01 .6200000E-01 .6700000E-01

PROPERTY TABLE C MAT= 8 NUM. POINTS= 6
 SLOC= 1 1006.200 1006.600 1007.000 1009.000
 1014.000 1021.000

PROPERTY TABLE C MAT= 8 NUM. POINTS= 12
 SLOC= 7 1030.000 1040.000 1051.000 1063.000
 1075.000 1087.000

PROPERTY TABLE C MAT= 8 NUM. POINTS= 15
 SLOC= 13 1099.000 1121.000 1141.000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 6
 SLOC= 1 1.303700 1.213500 1.123300 .9625000
 .8425000 .7485000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 12
 SLOC= 7 .6739000 .6124000 .5615000 .5214000
 .4812000 .4512000

PROPERTY TABLE DENS MAT= 9 NUM. POINTS= 15

SLOC= 13 .4211000 .3743000 .3368000

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 6
 SLOC= 1 .2300000E-01 .2400000E-01 .2600000E-01 .2900000E-01
 .3300000E-01 .3600000E-01

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 12
 SLOC= 7 .3900000E-01 .4200000E-01 .4500000E-01 .4700000E-01
 .5000000E-01 .5200000E-01

PROPERTY TABLE KXX MAT= 9 NUM. POINTS= 15
 SLOC= 13 .5500000E-01 .6000000E-01 .6500000E-01

PROPERTY TABLE C MAT= 9 NUM. POINTS= 6
 SLOC= 1 1041.800 1041.400 1041.000 1042.000
 1045.000 1050.000

PROPERTY TABLE C MAT= 9 NUM. POINTS= 12
 SLOC= 7 1056.000 1065.000 1075.000 1086.500
 1098.000 1159.000

PROPERTY TABLE C MAT= 9 NUM. POINTS= 15
 SLOC= 13 1220.000 1146.000 1167.000

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 6
 SLOC= 1 .1700000E-01 .1700000E-01 .1800000E-01 .2100000E-01
 .2300000E-01 .2500000E-01

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 12
 SLOC= 7 .2700000E-01 .2800000E-01 .3000000E-01 .3200000E-01
 .3400000E-01 .3600000E-01

PROPERTY TABLE KXX MAT= 10 NUM. POINTS= 15
 SLOC= 13 .3700000E-01 .4100000E-01 .4400000E-01

Define K and C for material 12

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***
 SLOC= 1 -73.15000 26.85000 126.8500
 326.8500 526.8500 726.8500

PROPERTY TABLE KXX MAT= 12 NUM. POINTS= 6
 SLOC= 1 413.0000 401.0000 393.0000 379.0000
 366.0000 352.0000

PROPERTY TABLE C MAT= 12 NUM. POINTS= 6
 SLOC= 1 356.0000 385.0000 397.0000 417.0000
 433.0000 451.0000

Define K and C for material 13

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 5 ***
 SLOC= 1 23.00000 50.00000 100.0000
 150.0000 200.0000

PROPERTY TABLE KXX MAT= 13 NUM. POINTS= 5
 SLOC= 1 182.5600 190.1700 199.2200 202.9100
 203.7200

PROPERTY TABLE C MAT= 13 NUM. POINTS= 5
 SLOC= 1 868.0000 903.0000 946.0000 976.0000
 998.0000

 ** End of Material Property List **

Define new material 15 for low thermal loading
outer barrier of 70/30 Copper Nickel (C71500)
Density: DENS (kg/m³)
Emissivity : EMIS
Conductivity: KXX (W/m/K)
Specific Heat: C (J/kg/K)

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 1 ***

SLOC= 1 .0000000E+00
Density (lb/in³ converted to kg/m³)

PROPERTY TABLE DENS MAT= 15 NUM. POINTS= 1

SLOC= 1 8940.640
Emissivity

PROPERTY TABLE EMIS MAT= 15 NUM. POINTS= 1

SLOC= 1 .4000000
Specific Heat (Btu/lb/F converted to J/kg/K)

PROPERTY TABLE C MAT= 15 NUM. POINTS= 1

SLOC= 1 376.7898
Conductivity (Btu/hr/ft/F converted to W/m/K)

TEMPERATURE TABLE ERASED.

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 2 ***

SLOC= 1 20.00000 100.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 4 ***

SLOC= 3 200.0000 300.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 6 ***

SLOC= 5 400.0000 500.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 8 ***

SLOC= 7 600.0000 700.0000

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 2

SLOC= 1 29.42190 29.24883

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 4

SLOC= 3 34.09479 38.59461

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 6

SLOC= 5 43.09443 48.11346

PROPERTY TABLE KXX MAT= 15 NUM. POINTS= 8

SLOC= 7 53.13249 58.15152

Read in single drum heat loads
Calculate the volumetric heat generation
(Assembly time is in years, FUEL is in seconds)

/INPUT FILE= pugls3.dat LINE= 0

```

** History of DHLW GLASS POUR CANISTER Heat Generation Rates **
** Output Calculated by T. L. Lotz 6/09/95 for ORNL Report Data **
**
** Executable File Name: MATHCAD.EXE **
** Output File Name: pugls3.dat **
** Execution Date: 06/09/95 **
** Start Age (years): 0.0 **
** Decay Period (years): 10000 **
** Enrichment (kg Pu): N.A. **
** Burnup (MWd/MTHM): N.A. **
** Assembly Type: SR Pour Canisters **
** Pu Fract. (kg Pu/KG HM):N.A. **

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**
** ASSY(#,1) is the Pour Cainster heat in Watts.
** ASSY(#,0) is the time post emplacement in years.
*****

```

PARAMETER ASSY(1,1) =	680.6300 680.2200	680.5300 680.1100	680.4200	680.3200
PARAMETER ASSY(7,1) =	680.0100 679.5900	679.9000 679.0800	679.8000	679.7000
PARAMETER ASSY(13,1) =	678.5600 676.5000	678.0500 675.9900	677.5300	677.0200
PARAMETER ASSY(19,1) =	675.4800 673.4300	674.9700 672.9200	674.4500	673.9400
PARAMETER ASSY(25,1) =	672.4100 670.3800	671.9100 665.3500	671.4000	670.8900
PARAMETER ASSY(31,1) =	660.3700 641.0200	655.4500 636.3200	650.5800	645.7700
PARAMETER ASSY(37,1) =	631.6700 613.6000	627.0700 609.2100	622.5300	618.0400
PARAMETER ASSY(43,1) =	604.8700 587.9900	600.5700 549.0100	596.3300	592.1400
PARAMETER ASSY(49,1) =	514.2100 408.3900	483.1300 388.5600	455.3700	430.5700
PARAMETER ASSY(55,1) =	370.8200 316.5600	354.9400 306.3200	340.7200	327.9800
PARAMETER ASSY(61,1) =	297.1300 268.8000	288.8800 233.0000	281.4700	274.8000
PARAMETER ASSY(67,1) =	218.7900 202.1000	211.9100 199.9200	207.7000	204.6200
PARAMETER ASSY(73,1) =	197.9600 191.6300	196.1900 190.3000	194.5600	193.0400
PARAMETER ASSY(79,1) =	189.0500 184.6900	187.8700 176.7700	186.7600	185.7000
PARAMETER ASSY(85,1) =	171.2200 156.3700	166.8400 153.2600	163.0600	159.6100
PARAMETER ASSY(91,1) =	150.2700 139.1700	147.3800 136.5900	144.5600	141.8300
PARAMETER ASSY(97,1) =	134.0700 124.6400	131.6200	129.2300	126.9100
PARAMETER ASSY(1,0) =	.1000000E-05 .4000000E-01	.1000000E-01 .5000000E-01	.2000000E-01	.3000000E-01
PARAMETER ASSY(7,0) =	.6000000E-01 .1000000	.7000000E-01 .1500000	.8000000E-01	.9000000E-01
PARAMETER ASSY(13,0) =	.2000000 .4000000	.2500000 .4500000	.3000000	.3500000
PARAMETER ASSY(19,0) =	.5000000 .7000000	.5500000 .7500000	.6000000	.6500000
PARAMETER ASSY(25,0) =	.8000000 1.000000	.8500000 1.500000	.9000000	.9500000

PARAMETER ASSY(31,0) =	2.000000 4.000000	2.500000 4.500000	3.000000	3.500000
PARAMETER ASSY(37,0) =	5.000000 7.000000	5.500000 7.500000	6.000000	6.500000
PARAMETER ASSY(43,0) =	8.000000 10.00000	8.500000 15.00000	9.000000	9.500000
PARAMETER ASSY(49,0) =	20.00000 40.00000	25.00000 45.00000	30.00000	35.00000
PARAMETER ASSY(55,0) =	50.00000 70.00000	55.00000 75.00000	60.00000	65.00000
PARAMETER ASSY(61,0) =	80.00000 100.0000	85.00000 150.0000	90.00000	95.00000
PARAMETER ASSY(67,0) =	200.0000 400.0000	250.0000 450.0000	300.0000	350.0000
PARAMETER ASSY(73,0) =	500.0000 700.0000	550.0000 750.0000	600.0000	650.0000
PARAMETER ASSY(79,0) =	800.0000 1000.000	850.0000 1500.000	900.0000	950.0000
PARAMETER ASSY(85,0) =	2000.000 4000.000	2500.000 4500.000	3000.000	3500.000
PARAMETER ASSY(91,0) =	5000.000 7000.000	5500.000 7500.000	6000.000	6500.000
PARAMETER ASSY(97,0) =	8000.000 10000.00	8500.000	9000.000	9500.000

PARAMETER ASSY(0,1) = 1.000000

FACTOR ON VECTOR OPERATION RESULT= .31558E+08
 FACTOR ON FIRST VECTOR PARAMETER = 1.0000
 FACTOR ON SECOND VECTOR PARAMETER= 1.0000
 FACTOR ON THIRD VECTOR PARAMETER = 1.0000

MATRIX COPY RESULT MATRIX= FUEL(1,0)

INPUT MATRIX= ASSY(1,0)
 INPUT MATRIX SIZE= 101 ROWS BY 2 COLUMNS
 RESULT MATRIX SIZE= 101 ROWS BY 2 COLUMNS

FACTOR ON VECTOR OPERATION RESULT= 1.6939
 FACTOR ON FIRST VECTOR PARAMETER = 1.0000
 FACTOR ON SECOND VECTOR PARAMETER= 1.0000
 FACTOR ON THIRD VECTOR PARAMETER = 1.0000

VECTOR PARAMETER OPERATION *VFUN

FUEL(1) = COPY ASSY(1)
 SCALE FACTORS RESULT= 1.6939 INPUT= 1.0000
 VECTOR LENGTH= 101

PARAMETER FUEL(0,1) = 1.000000

Define LOCAL Coordinate system for canister orientation
 if use CSYS,0, the P. Cans are 2x2,
 if use CSYS,15, the P. Cans are 1x2x1

LOCAL,15,0,0,0,0,0,0,45.0,0,0,0,0,

Construct geometry for a single SRP Pour Canister
 (K's 1 - 10)

(L's 1 - 16)
(A's 1 - 8)

KEYPOINT	1	X,Y,Z=	.000000E+00	.000000E+00	.000000E+00	IN CSYS= 0
KEYPOINT	2	X,Y,Z=	.324951	.324951	.000000E+00	IN CSYS= 0
KEYPOINT	3	X,Y,Z=	.116142	.116142	.000000E+00	IN CSYS= 0
KEYPOINT	4	X,Y,Z=	.116142	.533759	.000000E+00	IN CSYS= 0
KEYPOINT	5	X,Y,Z=	.533759	.533759	.000000E+00	IN CSYS= 0
KEYPOINT	6	X,Y,Z=	.533759	.116142	.000000E+00	IN CSYS= 0
KEYPOINT	7	X,Y,Z=	.109424	.109424	.000000E+00	IN CSYS= 0
KEYPOINT	8	X,Y,Z=	.109424	.540477	.000000E+00	IN CSYS= 0
KEYPOINT	9	X,Y,Z=	.540477	.540477	.000000E+00	IN CSYS= 0
KEYPOINT	10	X,Y,Z=	.540477	.109424	.000000E+00	IN CSYS= 0

LINE CONNECTS KEYPOINTS	3	2			
LINE NO.= 1	KP1= 3	TAN1=	-.7071	-.7071	.0000
	KP2= 2	TAN2=	.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	2	6			
LINE NO.= 2	KP1= 2	TAN1=	-.7071	.7071	.0000
	KP2= 6	TAN2=	.7071	-.7071	.0000

LINE CONNECTS KEYPOINTS	4	2			
LINE NO.= 3	KP1= 4	TAN1=	-.7071	.7071	.0000
	KP2= 2	TAN2=	.7071	-.7071	.0000

LINE CONNECTS KEYPOINTS	2	5			
LINE NO.= 4	KP1= 2	TAN1=	-.7071	-.7071	.0000
	KP2= 5	TAN2=	.7071	.7071	.0000

ARC BETWEEN KEYPOINTS	6 AND	5	ORIENTATION KEYPOINT=	2
RADIUS=	.29530			
LINE NO.= 5	KP1= 6	TAN1=	-.7071	-.7071
	KP2= 5	TAN2=	-.7071	.7071

ARC BETWEEN KEYPOINTS	5 AND	4	ORIENTATION KEYPOINT=	2
RADIUS=	.29530			
LINE NO.= 6	KP1= 5	TAN1=	.7071	-.7071
	KP2= 4	TAN2=	-.7071	-.7071

ARC BETWEEN KEYPOINTS	4 AND	3	ORIENTATION KEYPOINT=	2
RADIUS=	.29530			
LINE NO.= 7	KP1= 4	TAN1=	.7071	.7071
	KP2= 3	TAN2=	.7071	-.7071

ARC BETWEEN KEYPOINTS	3 AND	6	ORIENTATION KEYPOINT=	2
RADIUS=	.29530			
LINE NO.= 8	KP1= 3	TAN1=	-.7071	.7071
	KP2= 6	TAN2=	.7071	.7071

LINE CONNECTS KEYPOINTS	7	3			
LINE NO.= 9	KP1= 7	TAN1=	-.7071	-.7071	.0000
	KP2= 3	TAN2=	.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	10	6			
LINE NO.= 10	KP1= 10	TAN1=	.7071	-.7071	.0000
	KP2= 6	TAN2=	-.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	9	5			
LINE NO.= 11	KP1= 9	TAN1=	.7071	.7071	.0000
	KP2= 5	TAN2=	-.7071	-.7071	.0000

```

LINE CONNECTS KEYPOINTS      8      4
LINE NO.= 12 KP1=      8 TAN1=  -.7071  .7071  .0000
                  KP2=      4 TAN2=  .7071  -.7071  .0000

ARC BETWEEN KEYPOINTS      7 AND      8 ORIENTATION KEYPOINT=      2
RADIUS= .30480
LINE NO.= 13 KP1=      7 TAN1=  .7071  -.7071  .0000
                  KP2=      8 TAN2=  .7071  .7071  .0000

ARC BETWEEN KEYPOINTS      8 AND      9 ORIENTATION KEYPOINT=      2
RADIUS= .30480
LINE NO.= 14 KP1=      8 TAN1=  -.7071  -.7071  .0000
                  KP2=      9 TAN2=  .7071  -.7071  .0000

ARC BETWEEN KEYPOINTS      9 AND     10 ORIENTATION KEYPOINT=      2
RADIUS= .30480
LINE NO.= 15 KP1=      9 TAN1=  -.7071  .7071  .0000
                  KP2=     10 TAN2=  -.7071  -.7071  .0000

ARC BETWEEN KEYPOINTS     10 AND      7 ORIENTATION KEYPOINT=      2
RADIUS= .30480
LINE NO.= 16 KP1=     10 TAN1=  .7071  .7071  .0000
                  KP2=      7 TAN2=  -.7071  .7071  .0000

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      2      4      5
(TRAVERSED IN SAME DIRECTION AS LINE      2)

AREA NUMBER =      1

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      1      2      8
(TRAVERSED IN SAME DIRECTION AS LINE      1)

AREA NUMBER =      2

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      1      3      7
(TRAVERSED IN SAME DIRECTION AS LINE      1)

AREA NUMBER =      3

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      3      4      6
(TRAVERSED IN SAME DIRECTION AS LINE      3)

AREA NUMBER =      4

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      5     10     15     11
(TRAVERSED IN SAME DIRECTION AS LINE      5)

AREA NUMBER =      5

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      8      9     16     10
(TRAVERSED IN SAME DIRECTION AS LINE      8)

AREA NUMBER =      6

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      7     12     13      9
(TRAVERSED IN SAME DIRECTION AS LINE      7)

AREA NUMBER =      7

```

```

DEFINE AREA BY LIST OF LINES
LINE LIST =      6     11     14     12
(TRAVERSED IN SAME DIRECTION AS LINE      6)

```

AREA NUMBER = 8

Interior and WP, Next

(K's 11 - 19)

(L's 17 - 34)

(A's 9 - 16)

KEYPOINT	11	X,Y,Z=	.784500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	12	X,Y,Z=	.554725	.554725	.000000E+00	IN CSYS=	0
KEYPOINT	13	X,Y,Z=	.000000E+00	.784500	.000000E+00	IN CSYS=	0
KEYPOINT	14	X,Y,Z=	.804500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	15	X,Y,Z=	.568867	.568867	.000000E+00	IN CSYS=	0
KEYPOINT	16	X,Y,Z=	.000000E+00	.804500	.000000E+00	IN CSYS=	0
KEYPOINT	17	X,Y,Z=	.854500	.000000E+00	.000000E+00	IN CSYS=	0
KEYPOINT	18	X,Y,Z=	.604223	.604223	.000000E+00	IN CSYS=	0
KEYPOINT	19	X,Y,Z=	.000000E+00	.854500	.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS	1	7			
LINE NO.= 17	KP1= 1	TAN1=	-.7071	-.7071	.0000
	KP2= 7	TAN2=	.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	10	11			
LINE NO.= 18	KP1= 10	TAN1=	-.9125	.4092	.0000
	KP2= 11	TAN2=	.9125	-.4092	.0000

LINE CONNECTS KEYPOINTS	9	12			
LINE NO.= 19	KP1= 9	TAN1=	-.7071	-.7071	.0000
	KP2= 12	TAN2=	.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	8	13			
LINE NO.= 20	KP1= 8	TAN1=	.4092	-.9125	.0000
	KP2= 13	TAN2=	-.4092	.9125	.0000

LINE CONNECTS KEYPOINTS	1	13			
LINE NO.= 21	KP1= 1	TAN1=	.0000	-1.0000	.0000
	KP2= 13	TAN2=	.0000	1.0000	.0000

LINE CONNECTS KEYPOINTS	1	11			
LINE NO.= 22	KP1= 1	TAN1=	-1.0000	.0000	.0000
	KP2= 11	TAN2=	1.0000	.0000	.0000

ARC BETWEEN KEYPOINTS	11 AND	12	ORIENTATION KEYPOINT=	1
RADIUS=	.78450			
LINE NO.= 23	KP1= 11	TAN1=	.0000	-1.0000
	KP2= 12	TAN2=	-.7071	.7071

ARC BETWEEN KEYPOINTS	12 AND	13	ORIENTATION KEYPOINT=	1
RADIUS=	.78450			
LINE NO.= 24	KP1= 12	TAN1=	.7071	-.7071
	KP2= 13	TAN2=	-1.0000	.0000

LINE CONNECTS KEYPOINTS	11	14			
LINE NO.= 25	KP1= 11	TAN1=	-1.0000	.0000	.0000
	KP2= 14	TAN2=	1.0000	.0000	.0000

LINE CONNECTS KEYPOINTS	12	15			
LINE NO.= 26	KP1= 12	TAN1=	-.7071	-.7071	.0000
	KP2= 15	TAN2=	.7071	.7071	.0000

LINE CONNECTS KEYPOINTS	16	13			

LINE NO.=	27	KP1=	16	TAN1=	.0000	1.0000	.0000
		KP2=	13	TAN2=	.0000	-1.0000	.0000
ARC BETWEEN KEYPOINTS 14 AND 15 ORIENTATION KEYPOINT= 1							
RADIUS= .80450							
LINE NO.=	28	KP1=	14	TAN1=	.0000	-1.0000	.0000
		KP2=	15	TAN2=	-.7071	.7071	.0000
ARC BETWEEN KEYPOINTS 15 AND 16 ORIENTATION KEYPOINT= 1							
RADIUS= .80450							
LINE NO.=	29	KP1=	15	TAN1=	.7071	-.7071	.0000
		KP2=	16	TAN2=	-1.0000	.0000	.0000
LINE CONNECTS KEYPOINTS 14 17							
LINE NO.=	30	KP1=	14	TAN1=	-1.0000	.0000	.0000
		KP2=	17	TAN2=	1.0000	.0000	.0000
LINE CONNECTS KEYPOINTS 15 18							
LINE NO.=	31	KP1=	15	TAN1=	-.7071	-.7071	.0000
		KP2=	18	TAN2=	.7071	.7071	.0000
LINE CONNECTS KEYPOINTS 19 16							
LINE NO.=	32	KP1=	19	TAN1=	.0000	1.0000	.0000
		KP2=	16	TAN2=	.0000	-1.0000	.0000
ARC BETWEEN KEYPOINTS 18 AND 17 ORIENTATION KEYPOINT= 1							
RADIUS= .85450							
LINE NO.=	33	KP1=	18	TAN1=	-.7071	.7071	.0000
		KP2=	17	TAN2=	.0000	-1.0000	.0000
ARC BETWEEN KEYPOINTS 19 AND 18 ORIENTATION KEYPOINT= 1							
RADIUS= .85450							
LINE NO.=	34	KP1=	19	TAN1=	-1.0000	.0000	.0000
		KP2=	18	TAN2=	.7071	-.7071	.0000

DEFINE AREA BY LIST OF LINES

LINE LIST = 22 18 16 17
(TRAVERSED IN SAME DIRECTION AS LINE 22)

AREA NUMBER = 9

DEFINE AREA BY LIST OF LINES

LINE LIST = 23 19 15 18
(TRAVERSED IN SAME DIRECTION AS LINE 23)

AREA NUMBER = 10

DEFINE AREA BY LIST OF LINES

LINE LIST = 24 20 14 19
(TRAVERSED IN SAME DIRECTION AS LINE 24)

AREA NUMBER = 11

DEFINE AREA BY LIST OF LINES

LINE LIST = 21 17 13 20
(TRAVERSED IN SAME DIRECTION AS LINE 21)

AREA NUMBER = 12

DEFINE AREA BY LIST OF LINES

LINE LIST = 23 25 28 26
(TRAVERSED IN SAME DIRECTION AS LINE 23)

AREA NUMBER = 13

DEFINE AREA BY LIST OF LINES

LINE LIST = 24 26 29 27
(TRAVERSED IN SAME DIRECTION AS LINE 24)

AREA NUMBER = 14

DEFINE AREA BY LIST OF LINES

LINE LIST = 28 30 33 31
(TRAVERSED IN SAME DIRECTION AS LINE 28)

AREA NUMBER = 15

DEFINE AREA BY LIST OF LINES

LINE LIST = 29 31 34 32
(TRAVERSED IN SAME DIRECTION AS LINE 29)

AREA NUMBER = 16

Set element shapes and sizes

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

DEFAULT ELEMENT DIVISIONS PER LINE = 1

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 4 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 5 TO 8 STEP 1

8 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 13 TO 16 STEP 1

12 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 21 TO 24 STEP 1

16 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 28 TO 29 STEP 1

18 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 33 TO 34 STEP 1

20 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 9 TO 12 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 17 TO 20 STEP 1

4 LINES (OF 34 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 25 TO 27 STEP 1

*** NOTE ***

CP= 2.980 TIME= 16:51:46

Worst shape angle is 18 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***

92 93 94 95 96

NUMBER OF AREAS MESHED = 4
 MAXIMUM NODE NUMBER = 105
 MAXIMUM ELEMENT NUMBER = 96

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 13 TO 14 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 123
 MAXIMUM ELEMENT NUMBER = 112

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 15 TO 16 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 141
 MAXIMUM ELEMENT NUMBER = 128

Set up paths to extrude 3-D volumes from 2-D surfaces

(K's 20 - 31)

(L's 35 - 46)

Bottom direction first

KEYPOINT	20	X,Y,Z=	.000000E+00	.000000E+00	-1.49500	IN CSYS= 0
KEYPOINT	21	X,Y,Z=	.000000E+00	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	22	X,Y,Z=	.000000E+00	.000000E+00	-1.53500	IN CSYS= 0
KEYPOINT	23	X,Y,Z=	.000000E+00	.000000E+00	-1.56000	IN CSYS= 0
KEYPOINT	24	X,Y,Z=	.000000E+00	.000000E+00	-1.61500	IN CSYS= 0

LINE CONNECTS KEYPOINTS 1 20
 LINE NO.= 35 KP1= 1 TAN1= .0000 .0000 1.0000
 KP2= 20 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 20 21
 LINE NO.= 36 KP1= 20 TAN1= .0000 .0000 1.0000
 KP2= 21 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 21 22
 LINE NO.= 37 KP1= 21 TAN1= .0000 .0000 1.0000
 KP2= 22 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 22 23
 LINE NO.= 38 KP1= 22 TAN1= .0000 .0000 1.0000
 KP2= 23 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 23 24
 LINE NO.= 39 KP1= 23 TAN1= .0000 .0000 1.0000
 KP2= 24 TAN2= .0000 .0000 -1.0000

Top direction Next

KEYPOINT	25	X,Y,Z=	.000000E+00	.000000E+00	.659900	IN CSYS= 0

KEYPOINT 26 X,Y,Z= .000000E+00 .000000E+00 1.21460 1N CSYS= 0
 KEYPOINT 27 X,Y,Z= .000000E+00 .000000E+00 1.23460 1N CSYS= 0
 KEYPOINT 28 X,Y,Z= .000000E+00 .000000E+00 1.50500 1N CSYS= 0
 KEYPOINT 29 X,Y,Z= .000000E+00 .000000E+00 1.53000 1N CSYS= 0
 KEYPOINT 30 X,Y,Z= .000000E+00 .000000E+00 1.56000 1N CSYS= 0
 KEYPOINT 31 X,Y,Z= .000000E+00 .000000E+00 1.61500 1N CSYS= 0

LINE CONNECTS KEYPOINTS 1 25
 LINE NO.= 40 KP1= 1 TAN1= .0000 .0000 -1.0000
 KP2= 25 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 25 26
 LINE NO.= 41 KP1= 25 TAN1= .0000 .0000 -1.0000
 KP2= 26 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 26 27
 LINE NO.= 42 KP1= 26 TAN1= .0000 .0000 -1.0000
 KP2= 27 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 27 28
 LINE NO.= 43 KP1= 27 TAN1= .0000 .0000 -1.0000
 KP2= 28 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 28 29
 LINE NO.= 44 KP1= 28 TAN1= .0000 .0000 -1.0000
 KP2= 29 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 29 30
 LINE NO.= 45 KP1= 29 TAN1= .0000 .0000 -1.0000
 KP2= 30 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 30 31
 LINE NO.= 46 KP1= 30 TAN1= .0000 .0000 -1.0000
 KP2= 31 TAN2= .0000 .0000 1.0000

Set number of element divisions for extrusion into 3-D

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
 PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.
 GLASS

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 35 TO 35 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
 TO NDIV = 3, SPACING RATIO = 1.000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 40 TO 40 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 41 TO 41 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 36 TO 36 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 42 TO 42 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 1, SPACING RATIO = 1.000
Interior WP He Space

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 37 TO 37 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 43 TO 43 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 3, SPACING RATIO = 1.000
Inner Barrier Lids

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 38 TO 38 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 44 TO 44 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
TO NDIV = 2, SPACING RATIO = 1.000
Outer/Inner Barrier Gap (HE)

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 45 TO 45 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 39 TO 39 STEP 1

1 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 46 TO 46 STEP 1

2 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 46 STEP 1

46 LINES (OF 46 DEFINED) SELECTED BY LSEL COMMAND.

Reset coordinates if CSYS,15, option was used

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

Set up drift wall radiation matrix

(K's 32 - 34)

1) Define K's for extrude (will not use)

KEYPOINT 32 X,Y,Z= .000000E+00 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 33 X,Y,Z= .000000E+00 .183300 8.08250 IN CSYS= 0

KEYPOINT 34 X,Y,Z= .000000E+00 .183300 -8.08250 IN CSYS= 0

Define extrude lines (will not use)

(L's 47,48)

LINE CONNECTS KEYPOINTS 32 33

LINE NO.= 47 KP1= 32 TAN1= .0000 .0000 -1.0000
KP2= 33 TAN2= .0000 .0000 1.0000

LINE CONNECTS KEYPOINTS 32 34

LINE NO.= 48 KP1= 32 TAN1= .0000 .0000 1.0000
KP2= 34 TAN2= .0000 .0000 -1.0000

Extrude drift 8 elements with smallest
elements at WP mid-length (will not use)

SET DIVISIONS ON LINE 47 (IF SELECTED AND UNMESHED)

TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 48 (IF SELECTED AND UNMESHED)

TO NDIV = 8, SPACING RATIO = 8.400

2) Define K's and lines for lines of drift wall

(K's 35 - 39)

(L's 49 - 53)

Center Point

KEYPOINT 35 X,Y,Z= 1.73494 -1.61670 .000000E+00 IN CSYS= 0

KEYPOINT 36 X,Y,Z= 2.50000 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 37 X,Y,Z= .000000E+00 2.68330 .000000E+00 IN CSYS= 0

KEYPOINT 38 X,Y,Z= -2.50000 .183300 .000000E+00 IN CSYS= 0

KEYPOINT 39 X,Y,Z= -1.73494 -1.61670 .000000E+00 IN CSYS= 0

ARC BETWEEN KEYPOINTS 35 AND 36 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 49 KP1= 35 TAN1= -.7200 -.6940 .0000
KP2= 36 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 36 AND 37 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 50 KP1= 36 TAN1= .0000 -1.0000 .0000
KP2= 37 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 37 AND 38 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 51 KP1= 37 TAN1= 1.0000 .0000 .0000
KP2= 38 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 38 AND 39 ORIENTATION KEYPOINT= 32

RADIUS= 2.5000

LINE NO.= 52 KP1= 38 TAN1= .0000 1.0000 .0000
 KP2= 39 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 39 35
 LINE NO.= 53 KP1= 39 TAN1= -1.0000 .0000 .0000
 KP2= 35 TAN2= 1.0000 .0000 .0000
 Set element spacing for meshing

SET DIVISIONS ON LINE 49 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 50 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 51 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 52 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 53 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000
 Back Point

(K's 40 - 44)
 (L's 54 - 58)

KEYPOINT 40 X,Y,Z= 1.73494 -1.61670 -8.08250 IN CSYS= 0
 KEYPOINT 41 X,Y,Z= 2.50000 .183300 -8.08250 IN CSYS= 0
 KEYPOINT 42 X,Y,Z= .000000E+00 2.68330 -8.08250 IN CSYS= 0
 KEYPOINT 43 X,Y,Z= -2.50000 .183300 -8.08250 IN CSYS= 0
 KEYPOINT 44 X,Y,Z= -1.73494 -1.61670 -8.08250 IN CSYS= 0

ARC BETWEEN KEYPOINTS 40 AND 41 ORIENTATION KEYPOINT= 34
 RADIUS= 2.5000
 LINE NO.= 54 KP1= 40 TAN1= -.7200 -.6940 .0000
 KP2= 41 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 41 AND 42 ORIENTATION KEYPOINT= 34
 RADIUS= 2.5000
 LINE NO.= 55 KP1= 41 TAN1= .0000 -1.0000 .0000
 KP2= 42 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 42 AND 43 ORIENTATION KEYPOINT= 34
 RADIUS= 2.5000
 LINE NO.= 56 KP1= 42 TAN1= 1.0000 .0000 .0000
 KP2= 43 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 43 AND 44 ORIENTATION KEYPOINT= 34
 RADIUS= 2.5000
 LINE NO.= 57 KP1= 43 TAN1= .0000 1.0000 .0000
 KP2= 44 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 44 40
 LINE NO.= 58 KP1= 44 TAN1= -1.0000 .0000 .0000
 KP2= 40 TAN2= 1.0000 .0000 .0000
 Set element spacing for meshing

SET DIVISIONS ON LINE 54 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 55 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 56 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 57 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 58 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000
Front Point

(K's 45 - 49)
(L's 59 - 63)

KEYPOINT	45	X,Y,Z=	1.73494	-1.61670	8.08250	IN CSYS=	0
KEYPOINT	46	X,Y,Z=	2.50000	.183300	8.08250	IN CSYS=	0
KEYPOINT	47	X,Y,Z=	.000000E+00	2.68330	8.08250	IN CSYS=	0
KEYPOINT	48	X,Y,Z=	-2.50000	.183300	8.08250	IN CSYS=	0
KEYPOINT	49	X,Y,Z=	-1.73494	-1.61670	8.08250	IN CSYS=	0

ARC BETWEEN KEYPOINTS 45 AND 46 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 59 KP1= 45 TAN1= -.7200 -.6940 .0000
KP2= 46 TAN2= .0000 1.0000 .0000

ARC BETWEEN KEYPOINTS 46 AND 47 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 60 KP1= 46 TAN1= .0000 -1.0000 .0000
KP2= 47 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 47 AND 48 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 61 KP1= 47 TAN1= 1.0000 .0000 .0000
KP2= 48 TAN2= .0000 -1.0000 .0000

ARC BETWEEN KEYPOINTS 48 AND 49 ORIENTATION KEYPOINT= 33
RADIUS= 2.5000
LINE NO.= 62 KP1= 48 TAN1= .0000 1.0000 .0000
KP2= 49 TAN2= .7200 -.6940 .0000

LINE CONNECTS KEYPOINTS 49 45
LINE NO.= 63 KP1= 49 TAN1= -1.0000 .0000 .0000
KP2= 45 TAN2= 1.0000 .0000 .0000
Set element spacing for meshing

SET DIVISIONS ON LINE 59 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 60 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 61 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 62 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 63 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000
3) Create connecting lines for wall; make areas
(L's 64 - 68)

LINE CONNECTS KEYPOINTS 35 40
LINE NO.= 64 KP1= 35 TAN1= .0000 .0000 1.0000
KP2= 40 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 36 41
LINE NO.= 65 KP1= 36 TAN1= .0000 .0000 1.0000
KP2= 41 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 37 42

LINE NO.= 66 KP1= 37 TAN1= .0000 .0000 1.0000
 KP2= 42 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 38 43
 LINE NO.= 67 KP1= 38 TAN1= .0000 .0000 1.0000
 KP2= 43 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 39 44
 LINE NO.= 68 KP1= 39 TAN1= .0000 .0000 1.0000
 KP2= 44 TAN2= .0000 .0000 -1.0000

SET DIVISIONS ON LINE 64 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 65 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 66 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 67 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400

SET DIVISIONS ON LINE 68 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 8.400
 (L's 69 - 73)

LINE CONNECTS KEYPOINTS 45 35
 LINE NO.= 69 KP1= 45 TAN1= .0000 .0000 1.0000
 KP2= 35 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 46 36
 LINE NO.= 70 KP1= 46 TAN1= .0000 .0000 1.0000
 KP2= 36 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 47 37
 LINE NO.= 71 KP1= 47 TAN1= .0000 .0000 1.0000
 KP2= 37 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 48 38
 LINE NO.= 72 KP1= 48 TAN1= .0000 .0000 1.0000
 KP2= 38 TAN2= .0000 .0000 -1.0000

LINE CONNECTS KEYPOINTS 49 39
 LINE NO.= 73 KP1= 49 TAN1= .0000 .0000 1.0000
 KP2= 39 TAN2= .0000 .0000 -1.0000

SET DIVISIONS ON LINE 69 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 70 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 71 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 72 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

SET DIVISIONS ON LINE 73 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = .119

Define cylindrical coordinate system for rotations, etc.

COORDINATE SYSTEM 11 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .00000E+00 .00000E+00 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

(A's 17 - 26)

DEFINE AREA BY LIST OF LINES

LINE LIST = 49 65 54 64
(TRAVERSED IN SAME DIRECTION AS LINE 49)

*** WARNING *** CP= 3.530 TIME= 16:51:47

Lines 49, 65, 54, and 64 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 17

DEFINE AREA BY LIST OF LINES

LINE LIST = 50 66 55 65
(TRAVERSED IN SAME DIRECTION AS LINE 50)

*** WARNING *** CP= 3.570 TIME= 16:51:47

Lines 50, 66, 55, and 65 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 18

DEFINE AREA BY LIST OF LINES

LINE LIST = 51 67 56 66
(TRAVERSED IN SAME DIRECTION AS LINE 51)

*** WARNING *** CP= 3.610 TIME= 16:51:47

Lines 51, 67, 56, and 66 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 19

DEFINE AREA BY LIST OF LINES

LINE LIST = 52 68 57 67
(TRAVERSED IN SAME DIRECTION AS LINE 52)

*** WARNING *** CP= 3.650 TIME= 16:51:47

Lines 52, 68, 57, and 67 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 20

DEFINE AREA BY LIST OF LINES

LINE LIST = 59 70 49 69
(TRAVERSED IN SAME DIRECTION AS LINE 59)

*** WARNING *** CP= 3.680 TIME= 16:51:47

Lines 59, 70, 49, and 69 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 21

DEFINE AREA BY LIST OF LINES

LINE LIST = 60 71 50 70
(TRAVERSED IN SAME DIRECTION AS LINE 60)

*** WARNING *** CP= 3.730 TIME= 16:51:47

Lines 60, 71, 50, and 70 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 22

DEFINE AREA BY LIST OF LINES

LINE LIST = 61 72 51 71
(TRAVERSED IN SAME DIRECTION AS LINE 61)

*** WARNING *** CP= 3.770 TIME= 16:51:47
Lines 61, 72, 51, and 71 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 23

DEFINE AREA BY LIST OF LINES
LINE LIST = 62 73 52 72
(TRAVERSED IN SAME DIRECTION AS LINE 62)

*** WARNING *** CP= 3.810 TIME= 16:51:47
Lines 62, 73, 52, and 72 do not lie on a common
coordinate value in the currently active coordinate system
(CSYS). A non-planar area (Coons patch) will be fitted.

AREA NUMBER = 24

DEFINE AREA BY LIST OF LINES
LINE LIST = 53 64 58 68
(TRAVERSED IN SAME DIRECTION AS LINE 53)

AREA NUMBER = 25

DEFINE AREA BY LIST OF LINES
LINE LIST = 63 69 53 73
(TRAVERSED IN SAME DIRECTION AS LINE 63)

AREA NUMBER = 26

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)
4) Set material type and Mesh areas

MATERIAL NUMBER SET TO 6

ELEMENT TYPE SET TO 11

GENERATE NODES AND ELEMENTS
IN AREAS 17 TO 24 IN STEPS OF 1

NUMBER OF AREAS MESHED = 8
MAXIMUM NODE NUMBER = 430
MAXIMUM ELEMENT NUMBER = 384

MATERIAL NUMBER SET TO 4

ELEMENT TYPE SET TO 11

GENERATE NODES AND ELEMENTS
IN AREAS 25 TO 26 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
MAXIMUM NODE NUMBER = 481
MAXIMUM ELEMENT NUMBER = 448

5) Set 3-D radiation shell elements

ELEMENT TYPE SET TO 46

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 481 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 46 REAL= 1 MATERIAL= 4 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 26 STEP 1

26 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 73 STEP 1

73 LINES (OF 73 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=KP COMPONENT=
IN RANGE 1 TO 49 STEP 1

49 KEYPOINTS (OF 49 DEFINED) SELECTED BY KSEL COMMAND.

Construct geometry for WP TOP end
(K's 50 - 55)

KEYPOINT	50	X,Y,Z=	.784500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	51	X,Y,Z=	.000000E+00	.784500	1.23460	IN CSYS= 0
KEYPOINT	52	X,Y,Z=	.804500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	53	X,Y,Z=	.000000E+00	.804500	1.23460	IN CSYS= 0
KEYPOINT	54	X,Y,Z=	.854500	.000000E+00	1.23460	IN CSYS= 0
KEYPOINT	55	X,Y,Z=	.000000E+00	.854500	1.23460	IN CSYS= 0

(L's 74 - 79)

LINE CONNECTS KEYPOINTS		27	50			
LINE NO.=	74	KP1=	27	TAN1=	-1.0000	.0000 .0000
		KP2=	50	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		27	51			
LINE NO.=	75	KP1=	27	TAN1=	.0000	-1.0000 .0000
		KP2=	51	TAN2=	.0000	1.0000 .0000
LINE CONNECTS KEYPOINTS		50	52			
LINE NO.=	76	KP1=	50	TAN1=	-1.0000	.0000 .0000
		KP2=	52	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		51	53			
LINE NO.=	77	KP1=	51	TAN1=	.0000	-1.0000 .0000
		KP2=	53	TAN2=	.0000	1.0000 .0000
LINE CONNECTS KEYPOINTS		52	54			
LINE NO.=	78	KP1=	52	TAN1=	-1.0000	.0000 .0000
		KP2=	54	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		53	55			
LINE NO.=	79	KP1=	53	TAN1=	.0000	-1.0000 .0000
		KP2=	55	TAN2=	.0000	1.0000 .0000

(L's 80 - 82)

ARC BETWEEN KEYPOINTS 50 AND 51 ORIENTATION KEYPOINT= 27
RADIUS= .78450

LINE NO.= 80 KP1= 50 TAN1= .0000 -1.0000 .0000
 KP2= 51 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 52 AND 53 ORIENTATION KEYPOINT= 27

RADIUS= .80450

LINE NO.= 81 KP1= 52 TAN1= .0000 -1.0000 .0000
 KP2= 53 TAN2= -1.0000 .0000 .0000

ARC BETWEEN KEYPOINTS 54 AND 55 ORIENTATION KEYPOINT= 27

RADIUS= .85450

LINE NO.= 82 KP1= 54 TAN1= .0000 -1.0000 .0000
 KP2= 55 TAN2= -1.0000 .0000 .0000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 74 TO 75 STEP 1

2 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 80 TO 82 STEP 1

5 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
 TO NDIV = 8, SPACING RATIO = 1.000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 76 TO 79 STEP 1

4 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 1 TO 26 STEP 1

26 AREAS (OF 26 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 1 TO 82 STEP 1

82 LINES (OF 82 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=KP COMPONENT=
 IN RANGE 1 TO 55 STEP 1

55 KEYPOINTS (OF 55 DEFINED) SELECTED BY KSEL COMMAND.
 (A's 27 - 29)

DEFINE AREA BY LIST OF LINES
 LINE LIST = 74 75 80
 (TRAVERSED IN SAME DIRECTION AS LINE 74)

AREA NUMBER = 27

DEFINE AREA BY LIST OF LINES
 LINE LIST = 80 76 81 77
 (TRAVERSED IN SAME DIRECTION AS LINE 80)

AREA NUMBER = 28

DEFINE AREA BY LIST OF LINES
 LINE LIST = 81 78 82 79
 (TRAVERSED IN SAME DIRECTION AS LINE 81)

AREA NUMBER = 29

 Construct geometry for WP Bottom end

(K's 56 - 61)

KEYPOINT	56	X,Y,Z=	.784500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	57	X,Y,Z=	.000000E+00	.784500	-1.51000	IN CSYS= 0
KEYPOINT	58	X,Y,Z=	.804500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	59	X,Y,Z=	.000000E+00	.804500	-1.51000	IN CSYS= 0
KEYPOINT	60	X,Y,Z=	.854500	.000000E+00	-1.51000	IN CSYS= 0
KEYPOINT	61	X,Y,Z=	.000000E+00	.854500	-1.51000	IN CSYS= 0

(L's 83 - 88)

LINE CONNECTS KEYPOINTS		21	56			
LINE NO.=	83	KP1=	21	TAN1=	-1.0000	.0000 .0000
		KP2=	56	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		21	57			
LINE NO.=	84	KP1=	21	TAN1=	.0000 -1.0000	.0000
		KP2=	57	TAN2=	.0000 1.0000	.0000
LINE CONNECTS KEYPOINTS		56	58			
LINE NO.=	85	KP1=	56	TAN1=	-1.0000	.0000 .0000
		KP2=	58	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		57	59			
LINE NO.=	86	KP1=	57	TAN1=	.0000 -1.0000	.0000
		KP2=	59	TAN2=	.0000 1.0000	.0000
LINE CONNECTS KEYPOINTS		58	60			
LINE NO.=	87	KP1=	58	TAN1=	-1.0000	.0000 .0000
		KP2=	60	TAN2=	1.0000	.0000 .0000
LINE CONNECTS KEYPOINTS		59	61			
LINE NO.=	88	KP1=	59	TAN1=	.0000 -1.0000	.0000
		KP2=	61	TAN2=	.0000 1.0000	.0000

(L's 89 - 91)

ARC BETWEEN KEYPOINTS		56 AND	57	ORIENTATION KEYPOINT=	21
RADIUS=		.78450			
LINE NO.=	89	KP1=	56	TAN1=	.0000 -1.0000 .0000
		KP2=	57	TAN2=	-1.0000 .0000 .0000
ARC BETWEEN KEYPOINTS		58 AND	59	ORIENTATION KEYPOINT=	21
RADIUS=		.80450			
LINE NO.=	90	KP1=	58	TAN1=	.0000 -1.0000 .0000
		KP2=	59	TAN2=	-1.0000 .0000 .0000
ARC BETWEEN KEYPOINTS		60 AND	61	ORIENTATION KEYPOINT=	21
RADIUS=		.85450			
LINE NO.=	91	KP1=	60	TAN1=	.0000 -1.0000 .0000
		KP2=	61	TAN2=	-1.0000 .0000 .0000

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 83 TO 84 STEP 1

2 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 89 TO 91 STEP 1

5 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES

```
TO NDIV = 8, SPACING RATIO = 1.000

SELECT      FOR ITEM=LINE COMPONENT=
IN RANGE    85 TO      88 STEP      1

4 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

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

ALL SELECT  FOR ITEM=AREA COMPONENT=
IN RANGE    1 TO      29 STEP      1

29 AREAS (OF 29 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT  FOR ITEM=LINE COMPONENT=
IN RANGE    1 TO     91 STEP      1

91 LINES (OF 91 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT  FOR ITEM=KP  COMPONENT=
IN RANGE    1 TO     61 STEP      1

61 KEYPOINTS (OF 61 DEFINED) SELECTED BY KSEL COMMAND.
(A's 30 - 32 )

DEFINE AREA BY LIST OF LINES
LINE LIST = 83 84 89
(TRAVERSED IN SAME DIRECTION AS LINE 83)

AREA NUMBER = 30

DEFINE AREA BY LIST OF LINES
LINE LIST = 89 85 90 86
(TRAVERSED IN SAME DIRECTION AS LINE 89)

AREA NUMBER = 31

DEFINE AREA BY LIST OF LINES
LINE LIST = 90 87 91 88
(TRAVERSED IN SAME DIRECTION AS LINE 90)

AREA NUMBER = 32
    Mesh areas
        Top and Bottom WP Ends

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 27 TO 32 IN STEPS OF 1

NUMBER OF AREAS MESHED = 6
MAXIMUM NODE NUMBER = 675
MAXIMUM ELEMENT NUMBER = 928
*****
    Extrude 2-D WP Interior into 3-D Space
    (V's 1 - 32)
        Bottom WP Area

DRAG AREAS
    1, 2, 3, 4,
    ALONG LINES
    35, 36,

DRAG AREAS
```

5, 6, 7, 8,
ALONG LINES
35, 36,

DRAG AREAS
9, 10, 11, 12,
ALONG LINES
35, 36,

DRAG AREAS
13, 14,
ALONG LINES
35, 36,

DRAG AREAS
15, 16,
ALONG LINES
35, 36,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT	20 USED FOR KEYPOINT(S)	88	
KEYPOINT	21 USED FOR KEYPOINT(S)	96	
KEYPOINT	56 USED FOR KEYPOINT(S)	97	110
KEYPOINT	57 USED FOR KEYPOINT(S)	102	114
KEYPOINT	58 USED FOR KEYPOINT(S)	113	122
KEYPOINT	59 USED FOR KEYPOINT(S)	115	126
KEYPOINT	60 USED FOR KEYPOINT(S)	125	
KEYPOINT	61 USED FOR KEYPOINT(S)	127	
KEYPOINT	63 USED FOR KEYPOINT(S)	72	
KEYPOINT	64 USED FOR KEYPOINT(S)	73	
KEYPOINT	65 USED FOR KEYPOINT(S)	76	
KEYPOINT	66 USED FOR KEYPOINT(S)	78	
KEYPOINT	68 USED FOR KEYPOINT(S)	80	
KEYPOINT	69 USED FOR KEYPOINT(S)	81	
KEYPOINT	70 USED FOR KEYPOINT(S)	84	
KEYPOINT	71 USED FOR KEYPOINT(S)	86	
KEYPOINT	74 USED FOR KEYPOINT(S)	93	
KEYPOINT	75 USED FOR KEYPOINT(S)	90	
KEYPOINT	77 USED FOR KEYPOINT(S)	91	
KEYPOINT	79 USED FOR KEYPOINT(S)	95	
KEYPOINT	82 USED FOR KEYPOINT(S)	101	
KEYPOINT	83 USED FOR KEYPOINT(S)	98	
KEYPOINT	85 USED FOR KEYPOINT(S)	99	
KEYPOINT	87 USED FOR KEYPOINT(S)	103	
KEYPOINT	89 USED FOR KEYPOINT(S)	104	
KEYPOINT	92 USED FOR KEYPOINT(S)	105	
KEYPOINT	94 USED FOR KEYPOINT(S)	108	
KEYPOINT	100 USED FOR KEYPOINT(S)	111	
KEYPOINT	106 USED FOR KEYPOINT(S)	117	
KEYPOINT	107 USED FOR KEYPOINT(S)	116	
KEYPOINT	109 USED FOR KEYPOINT(S)	120	
KEYPOINT	112 USED FOR KEYPOINT(S)	123	
LINE	35 USED FOR LINE(S)	159	
LINE	36 USED FOR LINE(S)	179	
LINE	83 USED FOR LINE(S)	178	

*** WARNING *** CP= 8.680 TIME= 16:51:52
Unmeshed line 178 is merged into meshed line 83.
LINE 84 USED FOR LINE(S) 196

*** WARNING *** CP= 8.680 TIME= 16:51:52
Unmeshed line 196 is merged into meshed line 84.
LINE 85 USED FOR LINE(S) 218

*** WARNING *** CP= 8.680 TIME= 16:51:52
Unmeshed line 218 is merged into meshed line 85.
LINE 86 USED FOR LINE(S) 221

*** WARNING *** CP= 8.680 TIME= 16:51:52
Unmeshed line 221 is merged into meshed line 86.

LINE 87 USED FOR LINE(S) 244

*** WARNING ***

CP= 8.680 TIME= 16:51:52

Unmeshed line 244 is merged into meshed line 87.

LINE 88 USED FOR LINE(S) 247

*** WARNING ***

CP= 8.690 TIME= 16:51:52

Unmeshed line 247 is merged into meshed line 88.

LINE 94 USED FOR LINE(S) 119
 LINE 95 USED FOR LINE(S) 118
 LINE 96 USED FOR LINE(S) 120
 LINE 99 USED FOR LINE(S) 127
 LINE 100 USED FOR LINE(S) 126
 LINE 102 USED FOR LINE(S) 132
 LINE 103 USED FOR LINE(S) 131
 LINE 104 USED FOR LINE(S) 136
 LINE 107 USED FOR LINE(S) 139
 LINE 108 USED FOR LINE(S) 138
 LINE 109 USED FOR LINE(S) 140
 LINE 112 USED FOR LINE(S) 147
 LINE 113 USED FOR LINE(S) 146
 LINE 115 USED FOR LINE(S) 152
 LINE 116 USED FOR LINE(S) 151
 LINE 117 USED FOR LINE(S) 156
 LINE 122 USED FOR LINE(S) 169
 LINE 123 USED FOR LINE(S) 170
 LINE 124 USED FOR LINE(S) 162
 LINE 128 USED FOR LINE(S) 163
 LINE 129 USED FOR LINE(S) 164
 LINE 133 USED FOR LINE(S) 177
 LINE 134 USED FOR LINE(S) 174
 LINE 137 USED FOR LINE(S) 175
 LINE 142 USED FOR LINE(S) 189
 LINE 143 USED FOR LINE(S) 190
 LINE 144 USED FOR LINE(S) 182
 LINE 148 USED FOR LINE(S) 183
 LINE 149 USED FOR LINE(S) 184
 LINE 153 USED FOR LINE(S) 197
 LINE 154 USED FOR LINE(S) 194
 LINE 157 USED FOR LINE(S) 195
 LINE 160 USED FOR LINE(S) 199
 LINE 166 USED FOR LINE(S) 198
 LINE 167 USED FOR LINE(S) 200
 LINE 171 USED FOR LINE(S) 206
 LINE 172 USED FOR LINE(S) 207
 LINE 180 USED FOR LINE(S) 212
 LINE 186 USED FOR LINE(S) 211
 LINE 187 USED FOR LINE(S) 213
 LINE 191 USED FOR LINE(S) 219
 LINE 192 USED FOR LINE(S) 220
 LINE 202 USED FOR LINE(S) 226
 LINE 203 USED FOR LINE(S) 224
 LINE 204 USED FOR LINE(S) 225
 LINE 209 USED FOR LINE(S) 233
 LINE 210 USED FOR LINE(S) 232
 LINE 215 USED FOR LINE(S) 239
 LINE 216 USED FOR LINE(S) 237
 LINE 217 USED FOR LINE(S) 238
 LINE 222 USED FOR LINE(S) 246
 LINE 223 USED FOR LINE(S) 245
 AREA 34 USED FOR AREA(S) 57
 AREA 38 USED FOR AREA(S) 62
 AREA 41 USED FOR AREA(S) 66
 AREA 43 USED FOR AREA(S) 70
 AREA 46 USED FOR AREA(S) 73
 AREA 50 USED FOR AREA(S) 78
 AREA 53 USED FOR AREA(S) 82
 AREA 55 USED FOR AREA(S) 86
 AREA 59 USED FOR AREA(S) 96
 AREA 63 USED FOR AREA(S) 91

AREA	67	USED FOR AREA(S)	103
AREA	71	USED FOR AREA(S)	100
AREA	75	USED FOR AREA(S)	112
AREA	79	USED FOR AREA(S)	107
AREA	83	USED FOR AREA(S)	119
AREA	87	USED FOR AREA(S)	116
AREA	94	USED FOR AREA(S)	121
AREA	98	USED FOR AREA(S)	126
AREA	110	USED FOR AREA(S)	130
AREA	114	USED FOR AREA(S)	135
AREA	123	USED FOR AREA(S)	139
AREA	128	USED FOR AREA(S)	144
AREA	132	USED FOR AREA(S)	148
AREA	137	USED FOR AREA(S)	153

(V's 33 - 80)

Top WP Area

DRAG AREAS
1, 2, 3, 4,
ALONG LINES
40, 41, 42,

DRAG AREAS
5, 6, 7, 8,
ALONG LINES
40, 41, 42,

DRAG AREAS
9, 10, 11, 12,
ALONG LINES
40, 41, 42,

DRAG AREAS
13, 14,
ALONG LINES
40, 41, 42,

DRAG AREAS
15, 16,
ALONG LINES
40, 41, 42,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT	25	USED FOR KEYPOINT(S)	131
KEYPOINT	26	USED FOR KEYPOINT(S)	139
KEYPOINT	27	USED FOR KEYPOINT(S)	147
KEYPOINT	50	USED FOR KEYPOINT(S)	148
KEYPOINT	51	USED FOR KEYPOINT(S)	153
KEYPOINT	52	USED FOR KEYPOINT(S)	170
KEYPOINT	53	USED FOR KEYPOINT(S)	172
KEYPOINT	54	USED FOR KEYPOINT(S)	188
KEYPOINT	55	USED FOR KEYPOINT(S)	190
KEYPOINT	73	USED FOR KEYPOINT(S)	98
KEYPOINT	76	USED FOR KEYPOINT(S)	99
KEYPOINT	78	USED FOR KEYPOINT(S)	103
KEYPOINT	80	USED FOR KEYPOINT(S)	105
KEYPOINT	84	USED FOR KEYPOINT(S)	110
KEYPOINT	86	USED FOR KEYPOINT(S)	111
KEYPOINT	88	USED FOR KEYPOINT(S)	115
KEYPOINT	90	USED FOR KEYPOINT(S)	117
KEYPOINT	93	USED FOR KEYPOINT(S)	122
KEYPOINT	95	USED FOR KEYPOINT(S)	123
KEYPOINT	96	USED FOR KEYPOINT(S)	127
KEYPOINT	97	USED FOR KEYPOINT(S)	129
KEYPOINT	101	USED FOR KEYPOINT(S)	136
KEYPOINT	102	USED FOR KEYPOINT(S)	133
KEYPOINT	104	USED FOR KEYPOINT(S)	134
KEYPOINT	108	USED FOR KEYPOINT(S)	138
KEYPOINT	113	USED FOR KEYPOINT(S)	144
KEYPOINT	114	USED FOR KEYPOINT(S)	141

167
171
185
189

KEYPOINT	116 USED FOR KEYPOINT(S)	142
KEYPOINT	120 USED FOR KEYPOINT(S)	146
KEYPOINT	125 USED FOR KEYPOINT(S)	152
KEYPOINT	126 USED FOR KEYPOINT(S)	149
KEYPOINT	128 USED FOR KEYPOINT(S)	150
KEYPOINT	130 USED FOR KEYPOINT(S)	154
KEYPOINT	132 USED FOR KEYPOINT(S)	155
KEYPOINT	135 USED FOR KEYPOINT(S)	156
KEYPOINT	137 USED FOR KEYPOINT(S)	159
KEYPOINT	140 USED FOR KEYPOINT(S)	161
KEYPOINT	143 USED FOR KEYPOINT(S)	162
KEYPOINT	145 USED FOR KEYPOINT(S)	165
KEYPOINT	151 USED FOR KEYPOINT(S)	168
KEYPOINT	157 USED FOR KEYPOINT(S)	174
KEYPOINT	158 USED FOR KEYPOINT(S)	173
KEYPOINT	160 USED FOR KEYPOINT(S)	177
KEYPOINT	163 USED FOR KEYPOINT(S)	180
KEYPOINT	164 USED FOR KEYPOINT(S)	179
KEYPOINT	166 USED FOR KEYPOINT(S)	183
KEYPOINT	169 USED FOR KEYPOINT(S)	186
LINE	40 USED FOR LINE(S)	290
LINE	41 USED FOR LINE(S)	310
LINE	42 USED FOR LINE(S)	330
LINE	74 USED FOR LINE(S)	329

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 329 is merged into meshed line 74.
 LINE 75 USED FOR LINE(S) 347

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 347 is merged into meshed line 75.
 LINE 76 USED FOR LINE(S) 382

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 382 is merged into meshed line 76.
 LINE 77 USED FOR LINE(S) 385

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 385 is merged into meshed line 77.
 LINE 78 USED FOR LINE(S) 421

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 421 is merged into meshed line 78.
 LINE 79 USED FOR LINE(S) 424

*** WARNING *** CP= 12.750 TIME= 16:51:56
 Unmeshed line 424 is merged into meshed line 79.

LINE	120 USED FOR LINE(S)	207
LINE	126 USED FOR LINE(S)	206
LINE	127 USED FOR LINE(S)	211
LINE	136 USED FOR LINE(S)	224
LINE	138 USED FOR LINE(S)	221
LINE	140 USED FOR LINE(S)	237
LINE	146 USED FOR LINE(S)	233
LINE	147 USED FOR LINE(S)	245
LINE	156 USED FOR LINE(S)	250
LINE	159 USED FOR LINE(S)	247
LINE	162 USED FOR LINE(S)	251
LINE	169 USED FOR LINE(S)	258
LINE	170 USED FOR LINE(S)	257
LINE	175 USED FOR LINE(S)	263
LINE	177 USED FOR LINE(S)	262
LINE	178 USED FOR LINE(S)	267
LINE	183 USED FOR LINE(S)	270
LINE	184 USED FOR LINE(S)	269
LINE	189 USED FOR LINE(S)	271
LINE	195 USED FOR LINE(S)	278
LINE	196 USED FOR LINE(S)	277
LINE	198 USED FOR LINE(S)	283
LINE	199 USED FOR LINE(S)	282

LINE	200	USED FOR LINE(S)	287
LINE	213	USED FOR LINE(S)	300
LINE	218	USED FOR LINE(S)	301
LINE	219	USED FOR LINE(S)	293
LINE	225	USED FOR LINE(S)	294
LINE	226	USED FOR LINE(S)	295
LINE	238	USED FOR LINE(S)	308
LINE	239	USED FOR LINE(S)	305
LINE	246	USED FOR LINE(S)	306
LINE	253	USED FOR LINE(S)	320
LINE	254	USED FOR LINE(S)	321
LINE	255	USED FOR LINE(S)	313
LINE	259	USED FOR LINE(S)	314
LINE	260	USED FOR LINE(S)	315
LINE	264	USED FOR LINE(S)	328
LINE	265	USED FOR LINE(S)	325
LINE	268	USED FOR LINE(S)	326
LINE	273	USED FOR LINE(S)	340
LINE	274	USED FOR LINE(S)	341
LINE	275	USED FOR LINE(S)	333
LINE	279	USED FOR LINE(S)	334
LINE	280	USED FOR LINE(S)	335
LINE	284	USED FOR LINE(S)	348
LINE	285	USED FOR LINE(S)	345
LINE	288	USED FOR LINE(S)	346
LINE	291	USED FOR LINE(S)	350
LINE	297	USED FOR LINE(S)	349
LINE	298	USED FOR LINE(S)	351
LINE	302	USED FOR LINE(S)	357
LINE	303	USED FOR LINE(S)	358
LINE	311	USED FOR LINE(S)	363
LINE	317	USED FOR LINE(S)	362
LINE	318	USED FOR LINE(S)	364
LINE	322	USED FOR LINE(S)	370
LINE	323	USED FOR LINE(S)	371
LINE	331	USED FOR LINE(S)	376
LINE	337	USED FOR LINE(S)	375
LINE	338	USED FOR LINE(S)	377
LINE	342	USED FOR LINE(S)	383
LINE	343	USED FOR LINE(S)	384
LINE	353	USED FOR LINE(S)	390
LINE	354	USED FOR LINE(S)	388
LINE	355	USED FOR LINE(S)	389
LINE	360	USED FOR LINE(S)	397
LINE	361	USED FOR LINE(S)	396
LINE	366	USED FOR LINE(S)	403
LINE	367	USED FOR LINE(S)	401
LINE	368	USED FOR LINE(S)	402
LINE	373	USED FOR LINE(S)	410
LINE	374	USED FOR LINE(S)	409
LINE	379	USED FOR LINE(S)	416
LINE	380	USED FOR LINE(S)	414
LINE	381	USED FOR LINE(S)	415
LINE	386	USED FOR LINE(S)	423
LINE	387	USED FOR LINE(S)	422
AREA	62	USED FOR AREA(S)	169
AREA	78	USED FOR AREA(S)	174
AREA	91	USED FOR AREA(S)	178
AREA	100	USED FOR AREA(S)	182
AREA	112	USED FOR AREA(S)	185
AREA	126	USED FOR AREA(S)	190
AREA	139	USED FOR AREA(S)	194
AREA	148	USED FOR AREA(S)	198
AREA	158	USED FOR AREA(S)	201
AREA	162	USED FOR AREA(S)	206
AREA	165	USED FOR AREA(S)	210
AREA	167	USED FOR AREA(S)	214
AREA	171	USED FOR AREA(S)	224
AREA	175	USED FOR AREA(S)	219
AREA	179	USED FOR AREA(S)	231

AREA 183 USED FOR AREA(S) 228
 AREA 187 USED FOR AREA(S) 240
 AREA 191 USED FOR AREA(S) 235
 AREA 195 USED FOR AREA(S) 247
 AREA 199 USED FOR AREA(S) 244
 AREA 203 USED FOR AREA(S) 256
 AREA 207 USED FOR AREA(S) 251
 AREA 211 USED FOR AREA(S) 263
 AREA 215 USED FOR AREA(S) 260
 AREA 222 USED FOR AREA(S) 265
 AREA 226 USED FOR AREA(S) 270
 AREA 238 USED FOR AREA(S) 274
 AREA 242 USED FOR AREA(S) 279
 AREA 254 USED FOR AREA(S) 283
 AREA 258 USED FOR AREA(S) 288
 AREA 267 USED FOR AREA(S) 292
 AREA 272 USED FOR AREA(S) 297
 AREA 276 USED FOR AREA(S) 301
 AREA 281 USED FOR AREA(S) 306
 AREA 285 USED FOR AREA(S) 310
 AREA 290 USED FOR AREA(S) 315

Extrude 2-D WP Ends into 3-D Space
 (V's 81 - 89)

Bottom WP Area

DRAG AREAS

30, 31, 32,
 ALONG LINES
 37, 38, 39,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT 22 USED FOR KEYPOINT(S) 98
 KEYPOINT 23 USED FOR KEYPOINT(S) 117
 KEYPOINT 24 USED FOR KEYPOINT(S) 134
 LINE 37 USED FOR LINE(S) 207
 LINE 38 USED FOR LINE(S) 270
 LINE 39 USED FOR LINE(S) 310

(V's 90 - 101)

Top WP Area

DRAG AREAS

27, 28, 29,
 ALONG LINES
 43, 44, 45, 46,

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT 28 USED FOR KEYPOINT(S) 98
 KEYPOINT 29 USED FOR KEYPOINT(S) 150
 KEYPOINT 30 USED FOR KEYPOINT(S) 161
 KEYPOINT 31 USED FOR KEYPOINT(S) 172
 LINE 43 USED FOR LINE(S) 270
 LINE 44 USED FOR LINE(S) 371
 LINE 45 USED FOR LINE(S) 409
 LINE 46 USED FOR LINE(S) 434

Mesh Volumes - which are solid volumes - leave gaps to last
 Glass First

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
 PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 5

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
 IN VOLUMES 1 TO 4 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
 MAXIMUM NODE NUMBER = 846

MAXIMUM ELEMENT NUMBER = 1072

GENERATE NODES AND ELEMENTS
IN VOLUMES 33 TO 36 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 960
MAXIMUM ELEMENT NUMBER = 1168
SS in Pour Can.

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 5 TO 8 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1017
MAXIMUM ELEMENT NUMBER = 1216

GENERATE NODES AND ELEMENTS
IN VOLUMES 9 TO 16 IN STEPS OF 1

*** WARNING *** CP= 17.470 TIME= 16:52:01
Meshing of area 58 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.470 TIME= 16:52:01
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.510 TIME= 16:52:01
Meshing of area 60 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.510 TIME= 16:52:01
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.610 TIME= 16:52:01
Meshing of area 64 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.610 TIME= 16:52:01
Worst aspect ratio is 52.4561404 : 1.

*** WARNING *** CP= 17.710 TIME= 16:52:01
Meshing of area 68 produced 3 poorly shaped faces.

*** NOTE *** CP= 17.710 TIME= 16:52:01
Worst aspect ratio is 52.4561404 : 1.

NUMBER OF VOLUMES MESHED = 8
MAXIMUM NODE NUMBER = 1081
MAXIMUM ELEMENT NUMBER = 1280

GENERATE NODES AND ELEMENTS
IN VOLUMES 41 TO 44 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1195
MAXIMUM ELEMENT NUMBER = 1328

GENERATE NODES AND ELEMENTS
IN VOLUMES 45 TO 56 IN STEPS OF 1

*** WARNING *** CP= 19.220 TIME= 16:52:03
Meshing of area 170 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.220 TIME= 16:52:03
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.250 TIME= 16:52:03
Meshing of area 172 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.250 TIME= 16:52:03
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.340 TIME= 16:52:03
Meshing of area 176 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.340 TIME= 16:52:03
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.420 TIME= 16:52:03
Meshing of area 180 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.420 TIME= 16:52:03
Worst aspect ratio is 34.7315789 : 1.

*** WARNING *** CP= 19.570 TIME= 16:52:03
Meshing of area 186 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.570 TIME= 16:52:03
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.610 TIME= 16:52:03
Meshing of area 188 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.610 TIME= 16:52:03
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.710 TIME= 16:52:03
Meshing of area 192 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.710 TIME= 16:52:03
Worst aspect ratio is 29.1947368 : 1.

*** WARNING *** CP= 19.810 TIME= 16:52:03
Meshing of area 196 produced 2 poorly shaped faces.

*** NOTE *** CP= 19.810 TIME= 16:52:03
Worst aspect ratio is 29.1947368 : 1.

NUMBER OF VOLUMES MESHD = 12
MAXIMUM NODE NUMBER = 1291
MAXIMUM ELEMENT NUMBER = 1408
In. Bar. Material for WP

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 25 TO 28 IN STEPS OF 1

*** WARNING *** CP= 20.440 TIME= 16:52:04
Meshing of area 122 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.440 TIME= 16:52:04
Worst aspect ratio is 49.8333333 : 1.

*** WARNING *** CP= 20.490 TIME= 16:52:04
Meshing of area 124 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.490 TIME= 16:52:04
Worst aspect ratio is 49.8333333 : 1.

*** WARNING *** CP= 20.620 TIME= 16:52:04
Meshing of area 127 produced 6 poorly shaped faces.

*** NOTE *** CP= 20.620 TIME= 16:52:04
Worst aspect ratio is 49.833333 : 1.

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 1393
MAXIMUM ELEMENT NUMBER = 1472

GENERATE NODES AND ELEMENTS
IN VOLUMES 69 TO 74 IN STEPS OF 1

*** WARNING *** CP= 21.270 TIME= 16:52:05
Meshing of area 266 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.270 TIME= 16:52:05
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.310 TIME= 16:52:05
Meshing of area 268 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.310 TIME= 16:52:05
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.420 TIME= 16:52:05
Meshing of area 271 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.420 TIME= 16:52:05
Worst aspect ratio is 32.995 : 1.

*** WARNING *** CP= 21.560 TIME= 16:52:05
Meshing of area 275 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.560 TIME= 16:52:05
Worst aspect ratio is 27.735 : 1.

*** WARNING *** CP= 21.600 TIME= 16:52:05
Meshing of area 277 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.600 TIME= 16:52:05
Worst aspect ratio is 27.735 : 1.

*** WARNING *** CP= 21.710 TIME= 16:52:05
Meshing of area 280 produced 4 poorly shaped faces.

*** NOTE *** CP= 21.710 TIME= 16:52:05
Worst aspect ratio is 27.735 : 1.

NUMBER OF VOLUMES MESHED = 6
MAXIMUM NODE NUMBER = 1522
MAXIMUM ELEMENT NUMBER = 1552

GENERATE NODES AND ELEMENTS
IN VOLUMES 82 TO 82 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 1576
MAXIMUM ELEMENT NUMBER = 1584

GENERATE NODES AND ELEMENTS
IN VOLUMES 84 TO 85 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 1786
MAXIMUM ELEMENT NUMBER = 1712

GENERATE NODES AND ELEMENTS
IN VOLUMES 91 TO 91 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 1867
MAXIMUM ELEMENT NUMBER = 1760

GENERATE NODES AND ELEMENTS
IN VOLUMES 93 TO 94 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 2077
MAXIMUM ELEMENT NUMBER = 1888
Out. Bar. Material for WP

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.

MATERIAL NUMBER SET TO 15

ELEMENT TYPE SET TO 2

GENERATE NODES AND ELEMENTS
IN VOLUMES 29 TO 32 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2145
MAXIMUM ELEMENT NUMBER = 1952

GENERATE NODES AND ELEMENTS
IN VOLUMES 75 TO 80 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 6
MAXIMUM NODE NUMBER = 2231
MAXIMUM ELEMENT NUMBER = 2032

GENERATE NODES AND ELEMENTS
IN VOLUMES 83 TO 83 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 1
MAXIMUM NODE NUMBER = 2267
MAXIMUM ELEMENT NUMBER = 2064

GENERATE NODES AND ELEMENTS
IN VOLUMES 86 TO 89 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2497
MAXIMUM ELEMENT NUMBER = 2256

GENERATE NODES AND ELEMENTS
IN VOLUMES 92 TO 95 IN STEPS OF 3

NUMBER OF VOLUMES MESHED = 2
MAXIMUM NODE NUMBER = 2587
MAXIMUM ELEMENT NUMBER = 2336

GENERATE NODES AND ELEMENTS
IN VOLUMES 98 TO 101 IN STEPS OF 1

NUMBER OF VOLUMES MESHED = 4
MAXIMUM NODE NUMBER = 2905
MAXIMUM ELEMENT NUMBER = 2528

DONT MESH OR ASSIGN MAT. ASSUME VOID SPACES
AND NO RADIATION TRANSFER IN THESE SPACES
He/Air in Pour Can.

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 37, 40,1

He/Air in WP I/O Bar. Gap - NO RADIATION

ESHAPE,2,
MAT, 7,

TYPE,2,
VMESH, 96, 97,1

Clear 2-D mesh

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 1 TO 1 STEP 1

22 AREAS (OF 366 DEFINED) SELECTED BY ASEL COMMAND.

CLEAR NODES AND ELEMENTS FROM ALL SELECTED AREAS

*** NOTE *** CP= 28.510 TIME= 16:52:12
Nodes cannot be cleared from area 1 because volume 1 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.510 TIME= 16:52:12
Nodes cannot be cleared from area 2 because volume 2 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.520 TIME= 16:52:12
Nodes cannot be cleared from area 3 because volume 3 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.530 TIME= 16:52:12
Nodes cannot be cleared from area 4 because volume 4 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.530 TIME= 16:52:12
Nodes cannot be cleared from area 5 because volume 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.540 TIME= 16:52:12
Nodes cannot be cleared from area 6 because volume 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.540 TIME= 16:52:12
Nodes cannot be cleared from area 7 because volume 11 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.540 TIME= 16:52:12
Nodes cannot be cleared from area 8 because volume 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.560 TIME= 16:52:12
Nodes cannot be cleared from area 13 because volume 25 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.560 TIME= 16:52:12
Nodes cannot be cleared from area 14 because volume 26 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.570 TIME= 16:52:12
Nodes cannot be cleared from area 15 because volume 29 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.570 TIME= 16:52:12
Nodes cannot be cleared from area 16 because volume 30 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.600 TIME= 16:52:12
Nodes cannot be cleared from area 28 because volume 91 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.600 TIME= 16:52:12
Nodes cannot be cleared from area 29 because volume 92 is meshed. Only
elements are deleted.

*** NOTE *** CP= 28.630 TIME= 16:52:12
Nodes cannot be cleared from area 31 because volume 82 is meshed. Only

elements are deleted.

*** NOTE *** CP= 28.640 TIME= 16:52:12
Nodes cannot be cleared from area 32 because volume 83 is meshed. Only
elements are deleted.

CLEARED 22 AREAS, 10 LINES, 3 KEYPOINTS

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 366 STEP 1

366 AREAS (OF 366 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 2528 STEP 1

2240 ELEMENTS (OF 2240 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 2905 STEP 1

2778 NODES (OF 2778 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 101 STEP 1

101 VOLUMES (OF 101 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 448 STEP 1

444 LINES (OF 444 DEFINED) SELECTED BY LSEL COMMAND.

MERGE IDENTICAL ELEMENTS

ZERO ELEMENTS WERE MERGED

MERGE COINCIDENT NODES WITHIN TOLERANCE OF .10000E-03

NODE	498	USED FOR NODES	1516
NODE	595	USED FOR NODES	1387
NODE	560	USED FOR NODES	1522
NODE	657	USED FOR NODES	1393
NODE	552	USED FOR NODES	1517
NODE	649	USED FOR NODES	1388
NODE	578	USED FOR NODES	2231
NODE	675	USED FOR NODES	2145
NODE	667	USED FOR NODES	2140
NODE	570	USED FOR NODES	2226
NODE	497	USED FOR NODES	1515
NODE	594	USED FOR NODES	1386
NODE	559	USED FOR NODES	1521
NODE	656	USED FOR NODES	1392
NODE	551	USED FOR NODES	1518
NODE	648	USED FOR NODES	1389
NODE	577	USED FOR NODES	2230
NODE	674	USED FOR NODES	2144
NODE	569	USED FOR NODES	2227
NODE	666	USED FOR NODES	2141
NODE	496	USED FOR NODES	1514
NODE	593	USED FOR NODES	1385
NODE	558	USED FOR NODES	1520
NODE	655	USED FOR NODES	1391
NODE	550	USED FOR NODES	1519
NODE	647	USED FOR NODES	1390
NODE	576	USED FOR NODES	2229
NODE	673	USED FOR NODES	2143
NODE	568	USED FOR NODES	2228
NODE	665	USED FOR NODES	2142
NODE	495	USED FOR NODES	1502
NODE	592	USED FOR NODES	1373

NODE	557	USED FOR NODES	1507
NODE	654	USED FOR NODES	1378
NODE	549	USED FOR NODES	1506
NODE	646	USED FOR NODES	1377
NODE	575	USED FOR NODES	2219
NODE	672	USED FOR NODES	2133
NODE	567	USED FOR NODES	2218
NODE	664	USED FOR NODES	2132
NODE	494	USED FOR NODES	1505
NODE	591	USED FOR NODES	1376
NODE	556	USED FOR NODES	1513
NODE	653	USED FOR NODES	1384
NODE	548	USED FOR NODES	1508
NODE	645	USED FOR NODES	1379
NODE	574	USED FOR NODES	2225
NODE	671	USED FOR NODES	2139
NODE	663	USED FOR NODES	2134
NODE	566	USED FOR NODES	2220
NODE	493	USED FOR NODES	1504
NODE	590	USED FOR NODES	1375
NODE	555	USED FOR NODES	1512
NODE	652	USED FOR NODES	1383
NODE	547	USED FOR NODES	1509
NODE	644	USED FOR NODES	1380
NODE	573	USED FOR NODES	2224
NODE	670	USED FOR NODES	2138
NODE	492	USED FOR NODES	1503
NODE	589	USED FOR NODES	1374
NODE	554	USED FOR NODES	1511
NODE	651	USED FOR NODES	1382
NODE	546	USED FOR NODES	1510
NODE	643	USED FOR NODES	1381
NODE	565	USED FOR NODES	2221
NODE	662	USED FOR NODES	2135
NODE	572	USED FOR NODES	2223
NODE	669	USED FOR NODES	2137
NODE	564	USED FOR NODES	2222
NODE	661	USED FOR NODES	2136

*** WARNING *** CP= 30.090 TIME= 16:52:14
 Same node numbers associated with more than one solid model entity.
 Future mesh clearing operations could produce unexpected results.
 NUMMRG,KP could correct this problem.

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

 Rotate this set into the other quadrants about the Z axis
 (V's 102 - 404)

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)
 (V's 102 - 202)

GENERATE 2 TOTAL SETS OF VOLUMES
 SET IS FROM 1 TO 101 IN STEPS OF 1
 DX,DY,DZ= .000E+00 90.0 .000E+00 CSYS= 11
 MAXIMUM NODE NUMBER = 5273
 MAXIMUM ELEMENT NUMBER = 4128
 (V's 203 - 303)

GENERATE 2 TOTAL SETS OF VOLUMES
 SET IS FROM 1 TO 101 IN STEPS OF 1
 DX,DY,DZ= .000E+00 180. .000E+00 CSYS= 11
 MAXIMUM NODE NUMBER = 7641
 MAXIMUM ELEMENT NUMBER = 5728
 (V's 304 - 404)

GENERATE 2 TOTAL SETS OF VOLUMES
SET IS FROM 1 TO 101 IN STEPS OF 1
DX,DY,DZ= .000E+00 270. .000E+00 CSYS= 11

MAXIMUM NODE NUMBER = 10009
MAXIMUM ELEMENT NUMBER = 7328

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

MERGE IDENTICAL ELEMENTS

ZERO ELEMENTS WERE MERGED

MERGE COINCIDENT NODES WITHIN TOLERANCE OF .10000E-03

NODE	3488	USED FOR NODES	5848
NODE	4099	USED FOR NODES	6471
NODE	4100	USED FOR NODES	6472
NODE	4539	USED FOR NODES	6911
NODE	4540	USED FOR NODES	6912
NODE	4037	USED FOR NODES	6397
NODE	5238	USED FOR NODES	7610
NODE	5239	USED FOR NODES	7611
NODE	4011	USED FOR NODES	6363
NODE	4012	USED FOR NODES	6364
NODE	3446	USED FOR NODES	5782
NODE	4920	USED FOR NODES	7292
NODE	4656	USED FOR NODES	7030
NODE	4657	USED FOR NODES	7031
NODE	4974	USED FOR NODES	7346
NODE	4345	USED FOR NODES	6717
NODE	4346	USED FOR NODES	6718
NODE	3448	USED FOR NODES	5786
NODE	3449	USED FOR NODES	5787
NODE	3450	USED FOR NODES	5788
NODE	4658	USED FOR NODES	7032
NODE	3975	USED FOR NODES	6327
NODE	3976	USED FOR NODES	6328
NODE	4921	USED FOR NODES	7293
NODE	4975	USED FOR NODES	7347
NODE	4660	USED FOR NODES	7055
NODE	3453	USED FOR NODES	5801
NODE	3452	USED FOR NODES	5800
NODE	4102	USED FOR NODES	6488
NODE	4014	USED FOR NODES	6372
NODE	4923	USED FOR NODES	7309
NODE	3978	USED FOR NODES	6336
NODE	4348	USED FOR NODES	6734
NODE	4541	USED FOR NODES	6927
NODE	4013	USED FOR NODES	6371
NODE	5240	USED FOR NODES	7626
NODE	3447	USED FOR NODES	5798
NODE	4038	USED FOR NODES	6401
NODE	4976	USED FOR NODES	7362
NODE	4659	USED FOR NODES	7054
NODE	4347	USED FOR NODES	6733
NODE	3489	USED FOR NODES	5852
NODE	3451	USED FOR NODES	5799
NODE	3977	USED FOR NODES	6335
NODE	4977	USED FOR NODES	7363
NODE	4101	USED FOR NODES	6487
NODE	4922	USED FOR NODES	7308
NODE	4661	USED FOR NODES	7056
NODE	5241	USED FOR NODES	7627
NODE	4542	USED FOR NODES	6928
NODE	3350	USED FOR NODES	5672
NODE	4603	USED FOR NODES	6977
NODE	5195	USED FOR NODES	7567
NODE	3398	USED FOR NODES	5754
NODE	4064	USED FOR NODES	6436
NODE	4884	USED FOR NODES	7256

NODE	3947	USED FOR NODES	6303
NODE	4885	USED FOR NODES	7257
NODE	3347	USED FOR NODES	5667
NODE	3858	USED FOR NODES	6202
NODE	4503	USED FOR NODES	6875
NODE	4504	USED FOR NODES	6876
NODE	4063	USED FOR NODES	6435
NODE	4958	USED FOR NODES	7324
NODE	4966	USED FOR NODES	7325
NODE	3859	USED FOR NODES	6203
NODE	4602	USED FOR NODES	6976
NODE	4309	USED FOR NODES	6681
NODE	4310	USED FOR NODES	6682
NODE	3349	USED FOR NODES	5671
NODE	5194	USED FOR NODES	7566
NODE	3912	USED FOR NODES	6256
NODE	3913	USED FOR NODES	6257
NODE	3351	USED FOR NODES	5673
NODE	4604	USED FOR NODES	6978
NODE	3354	USED FOR NODES	5686
NODE	4606	USED FOR NODES	7001
NODE	3861	USED FOR NODES	6211
NODE	4312	USED FOR NODES	6698
NODE	4887	USED FOR NODES	7273
NODE	4066	USED FOR NODES	6452
NODE	3353	USED FOR NODES	5685
NODE	5197	USED FOR NODES	7584
NODE	5196	USED FOR NODES	7583
NODE	4505	USED FOR NODES	6891
NODE	3860	USED FOR NODES	6210
NODE	3948	USED FOR NODES	6307
NODE	4886	USED FOR NODES	7272
NODE	3399	USED FOR NODES	5758
NODE	4506	USED FOR NODES	6892
NODE	3348	USED FOR NODES	5683
NODE	4311	USED FOR NODES	6697
NODE	4605	USED FOR NODES	7000
NODE	4065	USED FOR NODES	6451
NODE	4607	USED FOR NODES	7002
NODE	3914	USED FOR NODES	6264
NODE	3352	USED FOR NODES	5684
NODE	5193	USED FOR NODES	7582
NODE	3915	USED FOR NODES	6265
NODE	4045	USED FOR NODES	6415
NODE	3943	USED FOR NODES	6297
NODE	4736	USED FOR NODES	7086
NODE	4737	USED FOR NODES	7087
NODE	4400	USED FOR NODES	6750
NODE	4575	USED FOR NODES	6946
NODE	4576	USED FOR NODES	6954
NODE	4577	USED FOR NODES	6955
NODE	4161	USED FOR NODES	6511
NODE	4399	USED FOR NODES	6749
NODE	4046	USED FOR NODES	6423
NODE	3331	USED FOR NODES	5639
NODE	3394	USED FOR NODES	5748
NODE	4162	USED FOR NODES	6512
NODE	3850	USED FOR NODES	6190
NODE	3335	USED FOR NODES	5647
NODE	3851	USED FOR NODES	6194
NODE	3336	USED FOR NODES	5651
NODE	5037	USED FOR NODES	7379
NODE	3337	USED FOR NODES	5652
NODE	3904	USED FOR NODES	6244
NODE	5045	USED FOR NODES	7387
NODE	5046	USED FOR NODES	7388
NODE	3905	USED FOR NODES	6248
NODE	5075	USED FOR NODES	7404
NODE	4752	USED FOR NODES	7085
NODE	4759	USED FOR NODES	7095

NODE	4184	USED FOR NODES	6520
NODE	4415	USED FOR NODES	6758
NODE	5068	USED FOR NODES	7396
NODE	4177	USED FOR NODES	6510
NODE	4422	USED FOR NODES	6766
NODE	5061	USED FOR NODES	7386
NODE	4766	USED FOR NODES	7103
NODE	4191	USED FOR NODES	6528
NODE	5069	USED FOR NODES	7395
NODE	4416	USED FOR NODES	6757
NODE	4753	USED FOR NODES	7084
NODE	4185	USED FOR NODES	6519
NODE	4178	USED FOR NODES	6509
NODE	4760	USED FOR NODES	7094
NODE	5062	USED FOR NODES	7385
NODE	4767	USED FOR NODES	7102
NODE	5076	USED FOR NODES	7403
NODE	4423	USED FOR NODES	6765
NODE	4192	USED FOR NODES	6527
NODE	4193	USED FOR NODES	6526
NODE	4768	USED FOR NODES	7101
NODE	4761	USED FOR NODES	7093
NODE	5070	USED FOR NODES	7394
NODE	4417	USED FOR NODES	6756
NODE	4186	USED FOR NODES	6518
NODE	5063	USED FOR NODES	7384
NODE	4179	USED FOR NODES	6508
NODE	4754	USED FOR NODES	7083
NODE	5077	USED FOR NODES	7402
NODE	4424	USED FOR NODES	6764
NODE	5078	USED FOR NODES	7401
NODE	4755	USED FOR NODES	7082
NODE	4180	USED FOR NODES	6507
NODE	4187	USED FOR NODES	6517
NODE	4194	USED FOR NODES	6525
NODE	4418	USED FOR NODES	6755
NODE	4762	USED FOR NODES	7092
NODE	5064	USED FOR NODES	7383
NODE	4425	USED FOR NODES	6763
NODE	4769	USED FOR NODES	7100
NODE	5071	USED FOR NODES	7393
NODE	4756	USED FOR NODES	7081
NODE	4763	USED FOR NODES	7091
NODE	5065	USED FOR NODES	7382
NODE	5072	USED FOR NODES	7392
NODE	4181	USED FOR NODES	6506
NODE	4188	USED FOR NODES	6516
NODE	4419	USED FOR NODES	6754
NODE	5079	USED FOR NODES	7400
NODE	4770	USED FOR NODES	7099
NODE	4195	USED FOR NODES	6524
NODE	4426	USED FOR NODES	6762
NODE	4189	USED FOR NODES	6515
NODE	4764	USED FOR NODES	7090
NODE	4757	USED FOR NODES	7080
NODE	4420	USED FOR NODES	6753
NODE	4182	USED FOR NODES	6505
NODE	5073	USED FOR NODES	7391
NODE	5066	USED FOR NODES	7381
NODE	5080	USED FOR NODES	7399
NODE	4196	USED FOR NODES	6523
NODE	4771	USED FOR NODES	7098
NODE	4427	USED FOR NODES	6761
NODE	4421	USED FOR NODES	6752
NODE	4758	USED FOR NODES	7079
NODE	4190	USED FOR NODES	6514
NODE	5074	USED FOR NODES	7390
NODE	5067	USED FOR NODES	7380
NODE	4197	USED FOR NODES	6522
NODE	4765	USED FOR NODES	7089

NODE	5081	USED FOR NODES	7398
NODE	4183	USED FOR NODES	6504
NODE	4772	USED FOR NODES	7097
NODE	4428	USED FOR NODES	6760
NODE	6379	USED FOR NODES	8731
NODE	7342	USED FOR NODES	9714
NODE	7343	USED FOR NODES	9715
NODE	6468	USED FOR NODES	8840
NODE	6908	USED FOR NODES	9280
NODE	6343	USED FOR NODES	8695
NODE	6344	USED FOR NODES	8696
NODE	6380	USED FOR NODES	8732
NODE	5817	USED FOR NODES	8155
NODE	6467	USED FOR NODES	8839
NODE	5814	USED FOR NODES	8150
NODE	5818	USED FOR NODES	8156
NODE	5816	USED FOR NODES	8154
NODE	6713	USED FOR NODES	9085
NODE	6714	USED FOR NODES	9086
NODE	7024	USED FOR NODES	9398
NODE	5856	USED FOR NODES	8216
NODE	7606	USED FOR NODES	9978
NODE	7607	USED FOR NODES	9979
NODE	6907	USED FOR NODES	9279
NODE	6405	USED FOR NODES	8765
NODE	7025	USED FOR NODES	9399
NODE	7026	USED FOR NODES	9400
NODE	7288	USED FOR NODES	9660
NODE	7289	USED FOR NODES	9661
NODE	5821	USED FOR NODES	8169
NODE	5820	USED FOR NODES	8168
NODE	7028	USED FOR NODES	9423
NODE	6470	USED FOR NODES	8856
NODE	6346	USED FOR NODES	8704
NODE	6382	USED FOR NODES	8740
NODE	6716	USED FOR NODES	9102
NODE	7291	USED FOR NODES	9677
NODE	7608	USED FOR NODES	9994
NODE	6715	USED FOR NODES	9101
NODE	6909	USED FOR NODES	9295
NODE	5819	USED FOR NODES	8167
NODE	7290	USED FOR NODES	9676
NODE	5857	USED FOR NODES	8220
NODE	6469	USED FOR NODES	8855
NODE	6381	USED FOR NODES	8739
NODE	6406	USED FOR NODES	8769
NODE	7344	USED FOR NODES	9730
NODE	6345	USED FOR NODES	8703
NODE	7027	USED FOR NODES	9422
NODE	5815	USED FOR NODES	8166
NODE	7345	USED FOR NODES	9731
NODE	7029	USED FOR NODES	9424
NODE	7609	USED FOR NODES	9995
NODE	6910	USED FOR NODES	9296
NODE	5718	USED FOR NODES	8040
NODE	6971	USED FOR NODES	9345
NODE	6677	USED FOR NODES	9049
NODE	7252	USED FOR NODES	9624
NODE	5719	USED FOR NODES	8041
NODE	6678	USED FOR NODES	9050
NODE	6970	USED FOR NODES	9344
NODE	7334	USED FOR NODES	9693
NODE	6281	USED FOR NODES	8625
NODE	6972	USED FOR NODES	9346
NODE	7253	USED FOR NODES	9625
NODE	7562	USED FOR NODES	9934
NODE	5715	USED FOR NODES	8035
NODE	5766	USED FOR NODES	8122
NODE	6315	USED FOR NODES	8671
NODE	6432	USED FOR NODES	8804

NODE	6226	USED FOR NODES	8570
NODE	6227	USED FOR NODES	8571
NODE	6871	USED FOR NODES	9243
NODE	7326	USED FOR NODES	9692
NODE	6872	USED FOR NODES	9244
NODE	7563	USED FOR NODES	9935
NODE	6431	USED FOR NODES	8803
NODE	5717	USED FOR NODES	8039
NODE	6280	USED FOR NODES	8624
NODE	6974	USED FOR NODES	9369
NODE	5722	USED FOR NODES	8054
NODE	5720	USED FOR NODES	8052
NODE	7565	USED FOR NODES	9952
NODE	6679	USED FOR NODES	9065
NODE	6282	USED FOR NODES	8632
NODE	7564	USED FOR NODES	9951
NODE	7254	USED FOR NODES	9640
NODE	6873	USED FOR NODES	9259
NODE	6973	USED FOR NODES	9368
NODE	6433	USED FOR NODES	8819
NODE	6316	USED FOR NODES	8675
NODE	6434	USED FOR NODES	8820
NODE	6229	USED FOR NODES	8579
NODE	5767	USED FOR NODES	8126
NODE	6228	USED FOR NODES	8578
NODE	6874	USED FOR NODES	9260
NODE	7561	USED FOR NODES	9950
NODE	5721	USED FOR NODES	8053
NODE	6975	USED FOR NODES	9370
NODE	7255	USED FOR NODES	9641
NODE	5716	USED FOR NODES	8051
NODE	6680	USED FOR NODES	9066
NODE	6283	USED FOR NODES	8633
NODE	5762	USED FOR NODES	8116
NODE	6413	USED FOR NODES	8783
NODE	6530	USED FOR NODES	8880
NODE	6944	USED FOR NODES	9322
NODE	7104	USED FOR NODES	9454
NODE	5704	USED FOR NODES	8019
NODE	6945	USED FOR NODES	9323
NODE	7105	USED FOR NODES	9455
NODE	6272	USED FOR NODES	8612
NODE	5699	USED FOR NODES	8007
NODE	5703	USED FOR NODES	8015
NODE	6529	USED FOR NODES	8879
NODE	6414	USED FOR NODES	8791
NODE	7405	USED FOR NODES	9747
NODE	7414	USED FOR NODES	9756
NODE	6311	USED FOR NODES	8665
NODE	6767	USED FOR NODES	9117
NODE	6768	USED FOR NODES	9118
NODE	5705	USED FOR NODES	8020
NODE	7413	USED FOR NODES	9755
NODE	6943	USED FOR NODES	9314
NODE	6273	USED FOR NODES	8616
NODE	6218	USED FOR NODES	8558
NODE	6219	USED FOR NODES	8562
NODE	6783	USED FOR NODES	9126
NODE	6545	USED FOR NODES	8878
NODE	7443	USED FOR NODES	9772
NODE	7429	USED FOR NODES	9754
NODE	6552	USED FOR NODES	8888
NODE	7127	USED FOR NODES	9463
NODE	6790	USED FOR NODES	9134
NODE	7120	USED FOR NODES	9453
NODE	7436	USED FOR NODES	9764
NODE	7134	USED FOR NODES	9471
NODE	6559	USED FOR NODES	8896
NODE	7430	USED FOR NODES	9753
NODE	7121	USED FOR NODES	9452

NODE	7128	USED FOR NODES	9462
NODE	6546	USED FOR NODES	8877
NODE	6553	USED FOR NODES	8887
NODE	7437	USED FOR NODES	9763
NODE	6784	USED FOR NODES	9125
NODE	7444	USED FOR NODES	9771
NODE	6560	USED FOR NODES	8895
NODE	7135	USED FOR NODES	9470
NODE	6791	USED FOR NODES	9133
NODE	6554	USED FOR NODES	8886
NODE	7122	USED FOR NODES	9451
NODE	7438	USED FOR NODES	9762
NODE	6561	USED FOR NODES	8894
NODE	6785	USED FOR NODES	9124
NODE	7129	USED FOR NODES	9461
NODE	7431	USED FOR NODES	9752
NODE	7136	USED FOR NODES	9469
NODE	6547	USED FOR NODES	8876
NODE	7445	USED FOR NODES	9770
NODE	6792	USED FOR NODES	9132
NODE	6555	USED FOR NODES	8885
NODE	6793	USED FOR NODES	9131
NODE	7123	USED FOR NODES	9450
NODE	7432	USED FOR NODES	9751
NODE	6562	USED FOR NODES	8893
NODE	6548	USED FOR NODES	8875
NODE	7446	USED FOR NODES	9769
NODE	7137	USED FOR NODES	9468
NODE	7439	USED FOR NODES	9761
NODE	6786	USED FOR NODES	9123
NODE	7130	USED FOR NODES	9460
NODE	2109	USED FOR NODES	3419
NODE	2166	USED FOR NODES	3959
NODE	2498	USED FOR NODES	4662
NODE	2268	USED FOR NODES	4349
NODE	2499	USED FOR NODES	4663
NODE	2607	USED FOR NODES	4979
NODE	2110	USED FOR NODES	3420
NODE	2870	USED FOR NODES	5242
NODE	2871	USED FOR NODES	5243
NODE	2552	USED FOR NODES	4924
NODE	2167	USED FOR NODES	3960
NODE	2269	USED FOR NODES	4350
NODE	2232	USED FOR NODES	4103
NODE	2500	USED FOR NODES	4664
NODE	2553	USED FOR NODES	4925
NODE	2462	USED FOR NODES	4543
NODE	2463	USED FOR NODES	4544
NODE	2233	USED FOR NODES	4104
NODE	2202	USED FOR NODES	3995
NODE	2203	USED FOR NODES	3996
NODE	2108	USED FOR NODES	3418
NODE	2606	USED FOR NODES	4978
NODE	2609	USED FOR NODES	4995
NODE	2501	USED FOR NODES	4686
NODE	2234	USED FOR NODES	4119
NODE	2872	USED FOR NODES	5258
NODE	2168	USED FOR NODES	3967
NODE	2204	USED FOR NODES	4003
NODE	2270	USED FOR NODES	4365
NODE	2113	USED FOR NODES	3433
NODE	2554	USED FOR NODES	4940
NODE	2503	USED FOR NODES	4688
NODE	2608	USED FOR NODES	4994
NODE	2502	USED FOR NODES	4687
NODE	2464	USED FOR NODES	4559
NODE	2111	USED FOR NODES	3431
NODE	2271	USED FOR NODES	4366
NODE	2555	USED FOR NODES	4941
NODE	2873	USED FOR NODES	5259

NODE	2235	USED FOR NODES	4120
NODE	2465	USED FOR NODES	4560
NODE	2205	USED FOR NODES	4004
NODE	2112	USED FOR NODES	3432
NODE	2169	USED FOR NODES	3968
NODE	1815	USED FOR NODES	4609
NODE	1816	USED FOR NODES	4610
NODE	2427	USED FOR NODES	4508
NODE	1542	USED FOR NODES	4068
NODE	2042	USED FOR NODES	4888
NODE	2826	USED FOR NODES	5198
NODE	2827	USED FOR NODES	5199
NODE	1432	USED FOR NODES	3834
NODE	1433	USED FOR NODES	3835
NODE	2590	USED FOR NODES	4956
NODE	1751	USED FOR NODES	4313
NODE	1349	USED FOR NODES	3303
NODE	2043	USED FOR NODES	4889
NODE	2598	USED FOR NODES	4957
NODE	1350	USED FOR NODES	3304
NODE	1351	USED FOR NODES	3305
NODE	1814	USED FOR NODES	4608
NODE	1752	USED FOR NODES	4314
NODE	1487	USED FOR NODES	3889
NODE	1541	USED FOR NODES	4067
NODE	1486	USED FOR NODES	3888
NODE	2426	USED FOR NODES	4507
NODE	1353	USED FOR NODES	3317
NODE	1435	USED FOR NODES	3843
NODE	1817	USED FOR NODES	4632
NODE	1489	USED FOR NODES	3897
NODE	2044	USED FOR NODES	4904
NODE	1488	USED FOR NODES	3896
NODE	2828	USED FOR NODES	5215
NODE	1818	USED FOR NODES	4633
NODE	1819	USED FOR NODES	4634
NODE	1434	USED FOR NODES	3842
NODE	1543	USED FOR NODES	4083
NODE	1354	USED FOR NODES	3318
NODE	1544	USED FOR NODES	4084
NODE	2825	USED FOR NODES	5214
NODE	1352	USED FOR NODES	3316
NODE	2428	USED FOR NODES	4523
NODE	2429	USED FOR NODES	4524
NODE	1753	USED FOR NODES	4329
NODE	2045	USED FOR NODES	4905
NODE	1754	USED FOR NODES	4330
NODE	2829	USED FOR NODES	5216
NODE	2677	USED FOR NODES	5019
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NODE	1524	USED FOR NODES	4055
NODE	1425	USED FOR NODES	3826
NODE	2678	USED FOR NODES	5020
NODE	1337	USED FOR NODES	3279
NODE	2322	USED FOR NODES	4381
NODE	2323	USED FOR NODES	4382
NODE	1339	USED FOR NODES	3284
NODE	1603	USED FOR NODES	4143
NODE	1478	USED FOR NODES	3876
NODE	1479	USED FOR NODES	3880
NODE	1787	USED FOR NODES	4578
NODE	1894	USED FOR NODES	4718
NODE	1788	USED FOR NODES	4586
NODE	1338	USED FOR NODES	3283
NODE	1604	USED FOR NODES	4144
NODE	1789	USED FOR NODES	4587
NODE	2669	USED FOR NODES	5011
NODE	1895	USED FOR NODES	4719
NODE	2707	USED FOR NODES	5036

NODE	2345	USED	FOR	NODES	4398
NODE	1917	USED	FOR	NODES	4727
NODE	1633	USED	FOR	NODES	4160
NODE	1924	USED	FOR	NODES	4735
NODE	2338	USED	FOR	NODES	4390
NODE	1626	USED	FOR	NODES	4152
NODE	1910	USED	FOR	NODES	4717
NODE	1619	USED	FOR	NODES	4142
NODE	2693	USED	FOR	NODES	5018
NODE	2700	USED	FOR	NODES	5028
NODE	7433	USED	FOR	NODES	9750
NODE	6549	USED	FOR	NODES	8874
NODE	7124	USED	FOR	NODES	9449
NODE	6787	USED	FOR	NODES	9122
NODE	6556	USED	FOR	NODES	8884
NODE	7131	USED	FOR	NODES	9459
NODE	7440	USED	FOR	NODES	9760
NODE	6794	USED	FOR	NODES	9130
NODE	6563	USED	FOR	NODES	8892
NODE	7447	USED	FOR	NODES	9768
NODE	7138	USED	FOR	NODES	9467
NODE	2346	USED	FOR	NODES	4397
NODE	2708	USED	FOR	NODES	5035
NODE	1918	USED	FOR	NODES	4726
NODE	1634	USED	FOR	NODES	4159
NODE	1925	USED	FOR	NODES	4734
NODE	2701	USED	FOR	NODES	5027
NODE	2339	USED	FOR	NODES	4389
NODE	1620	USED	FOR	NODES	4141
NODE	1627	USED	FOR	NODES	4151
NODE	1911	USED	FOR	NODES	4716
NODE	2694	USED	FOR	NODES	5017
NODE	2347	USED	FOR	NODES	4396
NODE	2709	USED	FOR	NODES	5034
NODE	1635	USED	FOR	NODES	4158
NODE	1912	USED	FOR	NODES	4715
NODE	2702	USED	FOR	NODES	5026
NODE	2695	USED	FOR	NODES	5016
NODE	1926	USED	FOR	NODES	4733
NODE	1621	USED	FOR	NODES	4140
NODE	1628	USED	FOR	NODES	4150
NODE	2340	USED	FOR	NODES	4388
NODE	1919	USED	FOR	NODES	4725
NODE	6557	USED	FOR	NODES	8883
NODE	7441	USED	FOR	NODES	9759
NODE	7125	USED	FOR	NODES	9448
NODE	7132	USED	FOR	NODES	9458
NODE	6795	USED	FOR	NODES	9129
NODE	7434	USED	FOR	NODES	9749
NODE	6550	USED	FOR	NODES	8873
NODE	6564	USED	FOR	NODES	8891
NODE	7448	USED	FOR	NODES	9767
NODE	6788	USED	FOR	NODES	9121
NODE	7139	USED	FOR	NODES	9466
NODE	2696	USED	FOR	NODES	5015
NODE	2703	USED	FOR	NODES	5025
NODE	1913	USED	FOR	NODES	4714
NODE	1622	USED	FOR	NODES	4139
NODE	1920	USED	FOR	NODES	4724
NODE	2341	USED	FOR	NODES	4387
NODE	1629	USED	FOR	NODES	4149
NODE	2348	USED	FOR	NODES	4395
NODE	2710	USED	FOR	NODES	5033
NODE	1927	USED	FOR	NODES	4732
NODE	1636	USED	FOR	NODES	4157
NODE	2349	USED	FOR	NODES	4394
NODE	2711	USED	FOR	NODES	5032
NODE	1921	USED	FOR	NODES	4723
NODE	1914	USED	FOR	NODES	4713
NODE	2342	USED	FOR	NODES	4386

NODE 1637	USED FOR NODES	4156		
NODE 1928	USED FOR NODES	4731		
NODE 1623	USED FOR NODES	4138		
NODE 2704	USED FOR NODES	5024		
NODE 1630	USED FOR NODES	4148		
NODE 2697	USED FOR NODES	5014		
NODE 6551	USED FOR NODES	8872		
NODE 7126	USED FOR NODES	9447		
NODE 7133	USED FOR NODES	9457		
NODE 6796	USED FOR NODES	9128		
NODE 7435	USED FOR NODES	9748		
NODE 6789	USED FOR NODES	9120		
NODE 7442	USED FOR NODES	9758		
NODE 6558	USED FOR NODES	8882		
NODE 7140	USED FOR NODES	9465		
NODE 6565	USED FOR NODES	8890		
NODE 7449	USED FOR NODES	9766		
NODE 1929	USED FOR NODES	4730		
NODE 1638	USED FOR NODES	4155		
NODE 1624	USED FOR NODES	4137		
NODE 2698	USED FOR NODES	5013		
NODE 1922	USED FOR NODES	4722		
NODE 1915	USED FOR NODES	4712		
NODE 2705	USED FOR NODES	5023		
NODE 2343	USED FOR NODES	4385		
NODE 1631	USED FOR NODES	4147		
NODE 2350	USED FOR NODES	4393		
NODE 2712	USED FOR NODES	5031		
NODE 2344	USED FOR NODES	4384		
NODE 1632	USED FOR NODES	4146		
NODE 1923	USED FOR NODES	4721		
NODE 1625	USED FOR NODES	4136		
NODE 1916	USED FOR NODES	4711		
NODE 2706	USED FOR NODES	5022		
NODE 2699	USED FOR NODES	5012		
NODE 1639	USED FOR NODES	4154		
NODE 2713	USED FOR NODES	5030		
NODE 1930	USED FOR NODES	4729		
NODE 2351	USED FOR NODES	4392		
NODE 1868	USED FOR NODES	4710	7078	9446
NODE 1595	USED FOR NODES	4153	6521	8889
NODE 2653	USED FOR NODES	5021	7389	9757
NODE 117	USED FOR NODES	3315		
NODE 2314	USED FOR NODES	4391	6759	9127
NODE 1878	USED FOR NODES	4720	7088	9456
NODE 1886	USED FOR NODES	4728	7096	9464
NODE 116	USED FOR NODES	3299		
NODE 659	USED FOR NODES	3484		
NODE 588	USED FOR NODES	3380		
NODE 2306	USED FOR NODES	4383	6751	9119
NODE 2642	USED FOR NODES	5010	7378	9746
NODE 2661	USED FOR NODES	5029	7397	9765
NODE 491	USED FOR NODES	3929		
NODE 134	USED FOR NODES	3414		
NODE 1577	USED FOR NODES	4135	6503	8871
NODE 1587	USED FOR NODES	4145	6513	8881
NODE 543	USED FOR NODES	3935		
NODE 658	USED FOR NODES	3480		
NODE 135	USED FOR NODES	3430		
NODE 561	USED FOR NODES	4029		
NODE 544	USED FOR NODES	3939		
NODE 562	USED FOR NODES	4033		
NODE 640	USED FOR NODES	3386		
NODE 92	USED FOR NODES	3271		
NODE 641	USED FOR NODES	3390		
NODE 2654	USED FOR NODES	9810		
NODE 2644	USED FOR NODES	9803		
NODE 2315	USED FOR NODES	9164		
NODE 1588	USED FOR NODES	8926		
NODE 1578	USED FOR NODES	8919		

NODE	1887	USED FOR NODES	9508
NODE	1879	USED FOR NODES	9501
NODE	2662	USED FOR NODES	9817
NODE	1869	USED FOR NODES	9494
NODE	2307	USED FOR NODES	9157
NODE	1596	USED FOR NODES	8933
NODE	2316	USED FOR NODES	9163
NODE	1579	USED FOR NODES	8918
NODE	1880	USED FOR NODES	9500
NODE	2663	USED FOR NODES	9816
NODE	1888	USED FOR NODES	9507
NODE	1597	USED FOR NODES	8932
NODE	2655	USED FOR NODES	9809
NODE	1870	USED FOR NODES	9493
NODE	1589	USED FOR NODES	8925
NODE	2308	USED FOR NODES	9156
NODE	2645	USED FOR NODES	9802
NODE	2664	USED FOR NODES	9815
NODE	2646	USED FOR NODES	9801
NODE	1590	USED FOR NODES	8924
NODE	2309	USED FOR NODES	9155
NODE	1881	USED FOR NODES	9499
NODE	1889	USED FOR NODES	9506
NODE	2317	USED FOR NODES	9162
NODE	2656	USED FOR NODES	9808
NODE	1580	USED FOR NODES	8917
NODE	1598	USED FOR NODES	8931
NODE	1871	USED FOR NODES	9492
NODE	2657	USED FOR NODES	9807
NODE	2665	USED FOR NODES	9814
NODE	2318	USED FOR NODES	9161
NODE	1591	USED FOR NODES	8923
NODE	1581	USED FOR NODES	8916
NODE	1872	USED FOR NODES	9491
NODE	1882	USED FOR NODES	9498
NODE	1599	USED FOR NODES	8930
NODE	1890	USED FOR NODES	9505
NODE	2310	USED FOR NODES	9154
NODE	2647	USED FOR NODES	9800
NODE	2319	USED FOR NODES	9160
NODE	2666	USED FOR NODES	9813
NODE	2311	USED FOR NODES	9153
NODE	2648	USED FOR NODES	9799
NODE	1582	USED FOR NODES	8915
NODE	1883	USED FOR NODES	9497
NODE	1592	USED FOR NODES	8922
NODE	2658	USED FOR NODES	9806
NODE	1873	USED FOR NODES	9490
NODE	1600	USED FOR NODES	8929
NODE	1891	USED FOR NODES	9504
NODE	2667	USED FOR NODES	9812
NODE	1884	USED FOR NODES	9496
NODE	2649	USED FOR NODES	9798
NODE	2312	USED FOR NODES	9152
NODE	2320	USED FOR NODES	9159
NODE	1892	USED FOR NODES	9503
NODE	1601	USED FOR NODES	8928
NODE	1593	USED FOR NODES	8921
NODE	1583	USED FOR NODES	8914
NODE	2659	USED FOR NODES	9805
NODE	1874	USED FOR NODES	9489
NODE	1893	USED FOR NODES	9502
NODE	1602	USED FOR NODES	8927
NODE	2668	USED FOR NODES	9811
NODE	2313	USED FOR NODES	9151
NODE	1885	USED FOR NODES	9495
NODE	1584	USED FOR NODES	8913
NODE	1875	USED FOR NODES	9488
NODE	1594	USED FOR NODES	8920
NODE	2321	USED FOR NODES	9158

NODE	2650	USED FOR NODES	9797
NODE	2660	USED FOR NODES	9804
NODE	1295	USED FOR NODES	8071
NODE	1450	USED FOR NODES	8640
NODE	1454	USED FOR NODES	8641
NODE	1400	USED FOR NODES	8587
NODE	1396	USED FOR NODES	8586
NODE	1586	USED FOR NODES	8898
NODE	1299	USED FOR NODES	8072
NODE	1877	USED FOR NODES	9473
NODE	1300	USED FOR NODES	8073
NODE	483	USED FOR NODES	8679
NODE	2651	USED FOR NODES	9781
NODE	1876	USED FOR NODES	9472
NODE	2643	USED FOR NODES	9773
NODE	580	USED FOR NODES	8130
NODE	1525	USED FOR NODES	8781
NODE	2652	USED FOR NODES	9782
NODE	75	USED FOR NODES	8067
NODE	1790	USED FOR NODES	9311
NODE	1798	USED FOR NODES	9312
NODE	1799	USED FOR NODES	9313
NODE	2304	USED FOR NODES	9135
NODE	1533	USED FOR NODES	8782
NODE	2305	USED FOR NODES	9136
NODE	1585	USED FOR NODES	8897
NODE	1471	USED FOR NODES	8651
NODE	1562	USED FOR NODES	8802
NODE	1772	USED FOR NODES	9048
NODE	1846	USED FOR NODES	9343
NODE	1417	USED FOR NODES	8597
NODE	1845	USED FOR NODES	9342
NODE	2063	USED FOR NODES	9623
NODE	2847	USED FOR NODES	9932
NODE	650	USED FOR NODES	8135
NODE	1416	USED FOR NODES	8596
NODE	553	USED FOR NODES	8684
NODE	1771	USED FOR NODES	9047
NODE	112	USED FOR NODES	8084
NODE	1470	USED FOR NODES	8650
NODE	1325	USED FOR NODES	8088
NODE	2446	USED FOR NODES	9241
NODE	2062	USED FOR NODES	9622
NODE	2846	USED FOR NODES	9929
NODE	2848	USED FOR NODES	9933
NODE	1844	USED FOR NODES	9341
NODE	2447	USED FOR NODES	9242
NODE	1561	USED FOR NODES	8801
NODE	1326	USED FOR NODES	8089
NODE	1327	USED FOR NODES	8090
NODE	1545	USED FOR NODES	8799
NODE	545	USED FOR NODES	8683
NODE	1546	USED FOR NODES	8800
NODE	642	USED FOR NODES	8134
NODE	1313	USED FOR NODES	8085
NODE	2046	USED FOR NODES	9620
NODE	2047	USED FOR NODES	9621
NODE	1408	USED FOR NODES	8594
NODE	1409	USED FOR NODES	8595
NODE	1462	USED FOR NODES	8648
NODE	108	USED FOR NODES	8083
NODE	1463	USED FOR NODES	8649
NODE	2430	USED FOR NODES	9239
NODE	2588	USED FOR NODES	9694
NODE	2431	USED FOR NODES	9240
NODE	2830	USED FOR NODES	9930
NODE	1315	USED FOR NODES	8087
NODE	1756	USED FOR NODES	9046
NODE	1820	USED FOR NODES	9338
NODE	1822	USED FOR NODES	9340

NODE	2831	USED FOR NODES	9931
NODE	1755	USED FOR NODES	9045
NODE	2589	USED FOR NODES	9702
NODE	1314	USED FOR NODES	8086
NODE	1821	USED FOR NODES	9339
NODE	2530	USED FOR NODES	9397
NODE	2195	USED FOR NODES	8750
NODE	2627	USED FOR NODES	9713
NODE	2483	USED FOR NODES	9278
NODE	2891	USED FOR NODES	9977
NODE	2098	USED FOR NODES	8189
NODE	2289	USED FOR NODES	9084
NODE	2573	USED FOR NODES	9659
NODE	2159	USED FOR NODES	8714
NODE	2253	USED FOR NODES	8838
NODE	2572	USED FOR NODES	9658
NODE	2158	USED FOR NODES	8713
NODE	2626	USED FOR NODES	9712
NODE	668	USED FOR NODES	8225
NODE	2096	USED FOR NODES	8187
NODE	2890	USED FOR NODES	9976
NODE	571	USED FOR NODES	8774
NODE	130	USED FOR NODES	8183
NODE	2482	USED FOR NODES	9277
NODE	2252	USED FOR NODES	8837
NODE	2194	USED FOR NODES	8749
NODE	2528	USED FOR NODES	9395
NODE	2288	USED FOR NODES	9083
NODE	2529	USED FOR NODES	9396
NODE	2097	USED FOR NODES	8188
NODE	2086	USED FOR NODES	8186
NODE	2151	USED FOR NODES	8712
NODE	2187	USED FOR NODES	8748
NODE	2150	USED FOR NODES	8711
NODE	2084	USED FOR NODES	8184
NODE	2186	USED FOR NODES	8747
NODE	2085	USED FOR NODES	8185
NODE	2236	USED FOR NODES	8835
NODE	2237	USED FOR NODES	8836
NODE	2557	USED FOR NODES	9657
NODE	2875	USED FOR NODES	9975
NODE	2466	USED FOR NODES	9275
NODE	2467	USED FOR NODES	9276
NODE	2504	USED FOR NODES	9392
NODE	563	USED FOR NODES	8773
NODE	2505	USED FOR NODES	9393
NODE	660	USED FOR NODES	8224
NODE	2273	USED FOR NODES	9082
NODE	2272	USED FOR NODES	9081
NODE	2874	USED FOR NODES	9974
NODE	126	USED FOR NODES	8182
NODE	2610	USED FOR NODES	9710
NODE	2611	USED FOR NODES	9711
NODE	2506	USED FOR NODES	9394
NODE	2556	USED FOR NODES	9656

*** WARNING *** CP= 62.410 TIME= 16:52:46
 Same node numbers associated with more than one solid model entity.
 Future mesh clearing operations could produce unexpected results.
 NUMMRG,KP could correct this problem.

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF .10000E-03

KEYPOINT	1 USED FOR KEYPOINT(S)	209	372	535
KEYPOINT	11 USED FOR KEYPOINT(S)	541		
KEYPOINT	13 USED FOR KEYPOINT(S)	210		
KEYPOINT	14 USED FOR KEYPOINT(S)	551		
KEYPOINT	16 USED FOR KEYPOINT(S)	223		
KEYPOINT	17 USED FOR KEYPOINT(S)	560		
KEYPOINT	19 USED FOR KEYPOINT(S)	232		
KEYPOINT	20 USED FOR KEYPOINT(S)	212	375	538

KEYPOINT	21	USED FOR KEYPOINT(S)	218	381	544
KEYPOINT	22	USED FOR KEYPOINT(S)	297	460	623
KEYPOINT	23	USED FOR KEYPOINT(S)	304	467	630
KEYPOINT	24	USED FOR KEYPOINT(S)	311	474	637
KEYPOINT	25	USED FOR KEYPOINT(S)	267	430	593
KEYPOINT	26	USED FOR KEYPOINT(S)	271	434	597
KEYPOINT	27	USED FOR KEYPOINT(S)	275	438	601
KEYPOINT	28	USED FOR KEYPOINT(S)	318	481	644
KEYPOINT	29	USED FOR KEYPOINT(S)	325	488	651
KEYPOINT	30	USED FOR KEYPOINT(S)	332	495	658
KEYPOINT	31	USED FOR KEYPOINT(S)	339	502	665
KEYPOINT	50	USED FOR KEYPOINT(S)	603		
KEYPOINT	51	USED FOR KEYPOINT(S)	274		
KEYPOINT	52	USED FOR KEYPOINT(S)	612		
KEYPOINT	53	USED FOR KEYPOINT(S)	285		
KEYPOINT	54	USED FOR KEYPOINT(S)	621		
KEYPOINT	55	USED FOR KEYPOINT(S)	294		
KEYPOINT	56	USED FOR KEYPOINT(S)	546		
KEYPOINT	57	USED FOR KEYPOINT(S)	217		
KEYPOINT	58	USED FOR KEYPOINT(S)	555		
KEYPOINT	59	USED FOR KEYPOINT(S)	228		
KEYPOINT	60	USED FOR KEYPOINT(S)	564		
KEYPOINT	61	USED FOR KEYPOINT(S)	237		
KEYPOINT	89	USED FOR KEYPOINT(S)	542		
KEYPOINT	94	USED FOR KEYPOINT(S)	211		
KEYPOINT	99	USED FOR KEYPOINT(S)	624		
KEYPOINT	103	USED FOR KEYPOINT(S)	296		
KEYPOINT	105	USED FOR KEYPOINT(S)	300		
KEYPOINT	107	USED FOR KEYPOINT(S)	552		
KEYPOINT	109	USED FOR KEYPOINT(S)	224		
KEYPOINT	110	USED FOR KEYPOINT(S)	625		
KEYPOINT	111	USED FOR KEYPOINT(S)	302		
KEYPOINT	115	USED FOR KEYPOINT(S)	627		
KEYPOINT	117	USED FOR KEYPOINT(S)	645		
KEYPOINT	119	USED FOR KEYPOINT(S)	561		
KEYPOINT	121	USED FOR KEYPOINT(S)	233		
KEYPOINT	122	USED FOR KEYPOINT(S)	631		
KEYPOINT	123	USED FOR KEYPOINT(S)	303		
KEYPOINT	127	USED FOR KEYPOINT(S)	307		
KEYPOINT	129	USED FOR KEYPOINT(S)	632		
KEYPOINT	131	USED FOR KEYPOINT(S)	309		
KEYPOINT	132	USED FOR KEYPOINT(S)	595		
KEYPOINT	133	USED FOR KEYPOINT(S)	634		
KEYPOINT	134	USED FOR KEYPOINT(S)	317		
KEYPOINT	136	USED FOR KEYPOINT(S)	638		
KEYPOINT	137	USED FOR KEYPOINT(S)	266		
KEYPOINT	138	USED FOR KEYPOINT(S)	310		
KEYPOINT	139	USED FOR KEYPOINT(S)	314		
KEYPOINT	140	USED FOR KEYPOINT(S)	599		
KEYPOINT	141	USED FOR KEYPOINT(S)	639		
KEYPOINT	142	USED FOR KEYPOINT(S)	316		
KEYPOINT	144	USED FOR KEYPOINT(S)	641		
KEYPOINT	145	USED FOR KEYPOINT(S)	270		
KEYPOINT	146	USED FOR KEYPOINT(S)	321		
KEYPOINT	147	USED FOR KEYPOINT(S)	646		
KEYPOINT	148	USED FOR KEYPOINT(S)	323		
KEYPOINT	149	USED FOR KEYPOINT(S)	648		
KEYPOINT	152	USED FOR KEYPOINT(S)	652		
KEYPOINT	153	USED FOR KEYPOINT(S)	324		
KEYPOINT	154	USED FOR KEYPOINT(S)	328		
KEYPOINT	155	USED FOR KEYPOINT(S)	653		
KEYPOINT	156	USED FOR KEYPOINT(S)	330		
KEYPOINT	158	USED FOR KEYPOINT(S)	606		
KEYPOINT	159	USED FOR KEYPOINT(S)	655		
KEYPOINT	160	USED FOR KEYPOINT(S)	279		
KEYPOINT	162	USED FOR KEYPOINT(S)	659		
KEYPOINT	164	USED FOR KEYPOINT(S)	609		
KEYPOINT	165	USED FOR KEYPOINT(S)	331		
KEYPOINT	166	USED FOR KEYPOINT(S)	282		
KEYPOINT	167	USED FOR KEYPOINT(S)	335		

KEYPOINT	168 USED FOR KEYPOINT(S)	660
KEYPOINT	170 USED FOR KEYPOINT(S)	337
KEYPOINT	171 USED FOR KEYPOINT(S)	662
KEYPOINT	173 USED FOR KEYPOINT(S)	666
KEYPOINT	174 USED FOR KEYPOINT(S)	338
KEYPOINT	176 USED FOR KEYPOINT(S)	615
KEYPOINT	177 USED FOR KEYPOINT(S)	342
KEYPOINT	178 USED FOR KEYPOINT(S)	288
KEYPOINT	179 USED FOR KEYPOINT(S)	667
KEYPOINT	180 USED FOR KEYPOINT(S)	344
KEYPOINT	182 USED FOR KEYPOINT(S)	618
KEYPOINT	183 USED FOR KEYPOINT(S)	669
KEYPOINT	184 USED FOR KEYPOINT(S)	291
KEYPOINT	215 USED FOR KEYPOINT(S)	373
KEYPOINT	216 USED FOR KEYPOINT(S)	374
KEYPOINT	220 USED FOR KEYPOINT(S)	380
KEYPOINT	225 USED FOR KEYPOINT(S)	386
KEYPOINT	226 USED FOR KEYPOINT(S)	387
KEYPOINT	229 USED FOR KEYPOINT(S)	391
KEYPOINT	234 USED FOR KEYPOINT(S)	395
KEYPOINT	235 USED FOR KEYPOINT(S)	396
KEYPOINT	238 USED FOR KEYPOINT(S)	400
KEYPOINT	269 USED FOR KEYPOINT(S)	429
KEYPOINT	273 USED FOR KEYPOINT(S)	433
KEYPOINT	277 USED FOR KEYPOINT(S)	437
KEYPOINT	280 USED FOR KEYPOINT(S)	442
KEYPOINT	283 USED FOR KEYPOINT(S)	445
KEYPOINT	286 USED FOR KEYPOINT(S)	448
KEYPOINT	289 USED FOR KEYPOINT(S)	451
KEYPOINT	292 USED FOR KEYPOINT(S)	454
KEYPOINT	295 USED FOR KEYPOINT(S)	457
KEYPOINT	298 USED FOR KEYPOINT(S)	459
KEYPOINT	299 USED FOR KEYPOINT(S)	463
KEYPOINT	301 USED FOR KEYPOINT(S)	465
KEYPOINT	305 USED FOR KEYPOINT(S)	466
KEYPOINT	306 USED FOR KEYPOINT(S)	470
KEYPOINT	308 USED FOR KEYPOINT(S)	472
KEYPOINT	312 USED FOR KEYPOINT(S)	473
KEYPOINT	313 USED FOR KEYPOINT(S)	477
KEYPOINT	315 USED FOR KEYPOINT(S)	479
KEYPOINT	319 USED FOR KEYPOINT(S)	480
KEYPOINT	320 USED FOR KEYPOINT(S)	484
KEYPOINT	322 USED FOR KEYPOINT(S)	486
KEYPOINT	326 USED FOR KEYPOINT(S)	487
KEYPOINT	327 USED FOR KEYPOINT(S)	491
KEYPOINT	329 USED FOR KEYPOINT(S)	493
KEYPOINT	333 USED FOR KEYPOINT(S)	494
KEYPOINT	334 USED FOR KEYPOINT(S)	498
KEYPOINT	336 USED FOR KEYPOINT(S)	500
KEYPOINT	340 USED FOR KEYPOINT(S)	501
KEYPOINT	341 USED FOR KEYPOINT(S)	505
KEYPOINT	343 USED FOR KEYPOINT(S)	507
KEYPOINT	378 USED FOR KEYPOINT(S)	536
KEYPOINT	379 USED FOR KEYPOINT(S)	537
KEYPOINT	383 USED FOR KEYPOINT(S)	543
KEYPOINT	388 USED FOR KEYPOINT(S)	549
KEYPOINT	389 USED FOR KEYPOINT(S)	550
KEYPOINT	392 USED FOR KEYPOINT(S)	554
KEYPOINT	397 USED FOR KEYPOINT(S)	558
KEYPOINT	398 USED FOR KEYPOINT(S)	559
KEYPOINT	401 USED FOR KEYPOINT(S)	563
KEYPOINT	432 USED FOR KEYPOINT(S)	592
KEYPOINT	436 USED FOR KEYPOINT(S)	596
KEYPOINT	440 USED FOR KEYPOINT(S)	600
KEYPOINT	443 USED FOR KEYPOINT(S)	605
KEYPOINT	446 USED FOR KEYPOINT(S)	608
KEYPOINT	449 USED FOR KEYPOINT(S)	611
KEYPOINT	452 USED FOR KEYPOINT(S)	614
KEYPOINT	455 USED FOR KEYPOINT(S)	617
KEYPOINT	458 USED FOR KEYPOINT(S)	620

KEYPOINT	461	USED FOR KEYPOINT(S)	622
KEYPOINT	462	USED FOR KEYPOINT(S)	626
KEYPOINT	464	USED FOR KEYPOINT(S)	628
KEYPOINT	468	USED FOR KEYPOINT(S)	629
KEYPOINT	469	USED FOR KEYPOINT(S)	633
KEYPOINT	471	USED FOR KEYPOINT(S)	635
KEYPOINT	475	USED FOR KEYPOINT(S)	636
KEYPOINT	476	USED FOR KEYPOINT(S)	640
KEYPOINT	478	USED FOR KEYPOINT(S)	642
KEYPOINT	482	USED FOR KEYPOINT(S)	643
KEYPOINT	483	USED FOR KEYPOINT(S)	647
KEYPOINT	485	USED FOR KEYPOINT(S)	649
KEYPOINT	489	USED FOR KEYPOINT(S)	650
KEYPOINT	490	USED FOR KEYPOINT(S)	654
KEYPOINT	492	USED FOR KEYPOINT(S)	656
KEYPOINT	496	USED FOR KEYPOINT(S)	657
KEYPOINT	497	USED FOR KEYPOINT(S)	661
KEYPOINT	499	USED FOR KEYPOINT(S)	663
KEYPOINT	503	USED FOR KEYPOINT(S)	664
KEYPOINT	504	USED FOR KEYPOINT(S)	668
KEYPOINT	506	USED FOR KEYPOINT(S)	670
LINE	21	USED FOR LINE(S)	511
LINE	22	USED FOR LINE(S)	1363
LINE	25	USED FOR LINE(S)	1385
LINE	27	USED FOR LINE(S)	549
LINE	30	USED FOR LINE(S)	1406
LINE	32	USED FOR LINE(S)	570
LINE	35	USED FOR LINE(S)	514 931 1348
LINE	36	USED FOR LINE(S)	533 950 1367
LINE	37	USED FOR LINE(S)	746 1163 1580
LINE	38	USED FOR LINE(S)	765 1182 1599
LINE	39	USED FOR LINE(S)	781 1198 1615
LINE	40	USED FOR LINE(S)	662 1079 1496
LINE	41	USED FOR LINE(S)	674 1091 1508
LINE	42	USED FOR LINE(S)	686 1103 1520
LINE	43	USED FOR LINE(S)	797 1214 1631
LINE	44	USED FOR LINE(S)	816 1233 1650
LINE	45	USED FOR LINE(S)	832 1249 1666
LINE	46	USED FOR LINE(S)	848 1265 1682
LINE	74	USED FOR LINE(S)	1529
LINE	75	USED FOR LINE(S)	685
LINE	76	USED FOR LINE(S)	1552
LINE	77	USED FOR LINE(S)	716
LINE	78	USED FOR LINE(S)	1576
LINE	79	USED FOR LINE(S)	740
LINE	83	USED FOR LINE(S)	1376
LINE	84	USED FOR LINE(S)	532
LINE	85	USED FOR LINE(S)	1396
LINE	86	USED FOR LINE(S)	560
LINE	87	USED FOR LINE(S)	1417
LINE	88	USED FOR LINE(S)	581
LINE	158	USED FOR LINE(S)	1364
LINE	160	USED FOR LINE(S)	1359
LINE	172	USED FOR LINE(S)	512
LINE	176	USED FOR LINE(S)	513
LINE	180	USED FOR LINE(S)	1373
LINE	192	USED FOR LINE(S)	531
LINE	204	USED FOR LINE(S)	1386
LINE	205	USED FOR LINE(S)	1387
LINE	206	USED FOR LINE(S)	1584
LINE	207	USED FOR LINE(S)	1635
LINE	208	USED FOR LINE(S)	550
LINE	209	USED FOR LINE(S)	547
LINE	211	USED FOR LINE(S)	1582
LINE	217	USED FOR LINE(S)	1395
LINE	222	USED FOR LINE(S)	558
LINE	224	USED FOR LINE(S)	744
LINE	230	USED FOR LINE(S)	1407
LINE	231	USED FOR LINE(S)	1408
LINE	233	USED FOR LINE(S)	745

LINE	234	USED FOR LINE(S)	571
LINE	235	USED FOR LINE(S)	568
LINE	237	USED FOR LINE(S)	756
LINE	243	USED FOR LINE(S)	1416
LINE	245	USED FOR LINE(S)	754
LINE	248	USED FOR LINE(S)	579
LINE	250	USED FOR LINE(S)	1585
LINE	251	USED FOR LINE(S)	1586
LINE	257	USED FOR LINE(S)	762
LINE	258	USED FOR LINE(S)	760
LINE	263	USED FOR LINE(S)	1591
LINE	267	USED FOR LINE(S)	1592
LINE	269	USED FOR LINE(S)	1602
LINE	271	USED FOR LINE(S)	1600
LINE	278	USED FOR LINE(S)	763
LINE	282	USED FOR LINE(S)	764
LINE	283	USED FOR LINE(S)	773
LINE	287	USED FOR LINE(S)	771
LINE	289	USED FOR LINE(S)	1505
LINE	291	USED FOR LINE(S)	1502
LINE	293	USED FOR LINE(S)	1603
LINE	294	USED FOR LINE(S)	1604
LINE	295	USED FOR LINE(S)	778
LINE	300	USED FOR LINE(S)	776
LINE	303	USED FOR LINE(S)	660
LINE	305	USED FOR LINE(S)	1608
LINE	306	USED FOR LINE(S)	1609
LINE	307	USED FOR LINE(S)	661
LINE	308	USED FOR LINE(S)	1618
LINE	309	USED FOR LINE(S)	1517
LINE	310	USED FOR LINE(S)	1633
LINE	311	USED FOR LINE(S)	1514
LINE	313	USED FOR LINE(S)	1616
LINE	315	USED FOR LINE(S)	779
LINE	320	USED FOR LINE(S)	780
LINE	321	USED FOR LINE(S)	789
LINE	323	USED FOR LINE(S)	672
LINE	325	USED FOR LINE(S)	787
LINE	327	USED FOR LINE(S)	673
LINE	328	USED FOR LINE(S)	1619
LINE	329	USED FOR LINE(S)	1620
LINE	330	USED FOR LINE(S)	794
LINE	331	USED FOR LINE(S)	1526
LINE	333	USED FOR LINE(S)	792
LINE	335	USED FOR LINE(S)	1624
LINE	340	USED FOR LINE(S)	1625
LINE	343	USED FOR LINE(S)	684
LINE	345	USED FOR LINE(S)	795
LINE	346	USED FOR LINE(S)	796
LINE	347	USED FOR LINE(S)	807
LINE	348	USED FOR LINE(S)	805
LINE	350	USED FOR LINE(S)	1636
LINE	351	USED FOR LINE(S)	1637
LINE	355	USED FOR LINE(S)	1535
LINE	356	USED FOR LINE(S)	1536
LINE	357	USED FOR LINE(S)	813
LINE	358	USED FOR LINE(S)	811
LINE	359	USED FOR LINE(S)	700
LINE	360	USED FOR LINE(S)	698
LINE	363	USED FOR LINE(S)	1642
LINE	364	USED FOR LINE(S)	1643
LINE	368	USED FOR LINE(S)	1543
LINE	369	USED FOR LINE(S)	1544
LINE	370	USED FOR LINE(S)	1653
LINE	372	USED FOR LINE(S)	708
LINE	373	USED FOR LINE(S)	706
LINE	375	USED FOR LINE(S)	1651
LINE	377	USED FOR LINE(S)	814
LINE	381	USED FOR LINE(S)	1551
LINE	382	USED FOR LINE(S)	815

LINE	383	USED FOR LINE(S)	824
LINE	384	USED FOR LINE(S)	822
LINE	386	USED FOR LINE(S)	714
LINE	388	USED FOR LINE(S)	1654
LINE	389	USED FOR LINE(S)	1655
LINE	390	USED FOR LINE(S)	829
LINE	394	USED FOR LINE(S)	1559
LINE	395	USED FOR LINE(S)	1560
LINE	396	USED FOR LINE(S)	827
LINE	398	USED FOR LINE(S)	724
LINE	399	USED FOR LINE(S)	722
LINE	401	USED FOR LINE(S)	1659
LINE	402	USED FOR LINE(S)	1660
LINE	403	USED FOR LINE(S)	1669
LINE	407	USED FOR LINE(S)	1567
LINE	408	USED FOR LINE(S)	1568
LINE	410	USED FOR LINE(S)	1667
LINE	411	USED FOR LINE(S)	732
LINE	412	USED FOR LINE(S)	730
LINE	415	USED FOR LINE(S)	830
LINE	416	USED FOR LINE(S)	831
LINE	420	USED FOR LINE(S)	1575
LINE	421	USED FOR LINE(S)	840
LINE	422	USED FOR LINE(S)	838
LINE	424	USED FOR LINE(S)	1670
LINE	425	USED FOR LINE(S)	738
LINE	427	USED FOR LINE(S)	1671
LINE	428	USED FOR LINE(S)	845
LINE	429	USED FOR LINE(S)	843
LINE	431	USED FOR LINE(S)	1675
LINE	432	USED FOR LINE(S)	1676
LINE	433	USED FOR LINE(S)	1685
LINE	435	USED FOR LINE(S)	1683
LINE	437	USED FOR LINE(S)	846
LINE	438	USED FOR LINE(S)	847
LINE	439	USED FOR LINE(S)	856
LINE	440	USED FOR LINE(S)	854
LINE	442	USED FOR LINE(S)	1686
LINE	443	USED FOR LINE(S)	1687
LINE	444	USED FOR LINE(S)	861
LINE	445	USED FOR LINE(S)	859
LINE	447	USED FOR LINE(S)	1691
LINE	448	USED FOR LINE(S)	1692
LINE	525	USED FOR LINE(S)	929
LINE	529	USED FOR LINE(S)	928
LINE	530	USED FOR LINE(S)	930
LINE	539	USED FOR LINE(S)	948
LINE	542	USED FOR LINE(S)	949
LINE	551	USED FOR LINE(S)	966
LINE	552	USED FOR LINE(S)	964
LINE	553	USED FOR LINE(S)	967
LINE	561	USED FOR LINE(S)	975
LINE	562	USED FOR LINE(S)	977
LINE	572	USED FOR LINE(S)	987
LINE	573	USED FOR LINE(S)	985
LINE	574	USED FOR LINE(S)	988
LINE	582	USED FOR LINE(S)	996
LINE	583	USED FOR LINE(S)	998
LINE	668	USED FOR LINE(S)	1077
LINE	671	USED FOR LINE(S)	1078
LINE	680	USED FOR LINE(S)	1089
LINE	683	USED FOR LINE(S)	1090
LINE	692	USED FOR LINE(S)	1101
LINE	695	USED FOR LINE(S)	1102
LINE	701	USED FOR LINE(S)	1115
LINE	702	USED FOR LINE(S)	1117
LINE	709	USED FOR LINE(S)	1123
LINE	710	USED FOR LINE(S)	1125
LINE	717	USED FOR LINE(S)	1131
LINE	718	USED FOR LINE(S)	1133

LINE	725	USED	FOR	LINE(S)	1139
LINE	726	USED	FOR	LINE(S)	1141
LINE	733	USED	FOR	LINE(S)	1147
LINE	734	USED	FOR	LINE(S)	1149
LINE	741	USED	FOR	LINE(S)	1155
LINE	742	USED	FOR	LINE(S)	1157
LINE	748	USED	FOR	LINE(S)	1161
LINE	750	USED	FOR	LINE(S)	1162
LINE	751	USED	FOR	LINE(S)	1171
LINE	752	USED	FOR	LINE(S)	1173
LINE	757	USED	FOR	LINE(S)	1177
LINE	758	USED	FOR	LINE(S)	1179
LINE	766	USED	FOR	LINE(S)	1180
LINE	768	USED	FOR	LINE(S)	1181
LINE	769	USED	FOR	LINE(S)	1188
LINE	770	USED	FOR	LINE(S)	1190
LINE	774	USED	FOR	LINE(S)	1193
LINE	775	USED	FOR	LINE(S)	1195
LINE	782	USED	FOR	LINE(S)	1196
LINE	784	USED	FOR	LINE(S)	1197
LINE	785	USED	FOR	LINE(S)	1204
LINE	786	USED	FOR	LINE(S)	1206
LINE	790	USED	FOR	LINE(S)	1209
LINE	791	USED	FOR	LINE(S)	1211
LINE	799	USED	FOR	LINE(S)	1212
LINE	801	USED	FOR	LINE(S)	1213
LINE	802	USED	FOR	LINE(S)	1222
LINE	803	USED	FOR	LINE(S)	1224
LINE	808	USED	FOR	LINE(S)	1228
LINE	809	USED	FOR	LINE(S)	1230
LINE	817	USED	FOR	LINE(S)	1231
LINE	819	USED	FOR	LINE(S)	1232
LINE	820	USED	FOR	LINE(S)	1239
LINE	821	USED	FOR	LINE(S)	1241
LINE	825	USED	FOR	LINE(S)	1244
LINE	826	USED	FOR	LINE(S)	1246
LINE	833	USED	FOR	LINE(S)	1247
LINE	835	USED	FOR	LINE(S)	1248
LINE	836	USED	FOR	LINE(S)	1255
LINE	837	USED	FOR	LINE(S)	1257
LINE	841	USED	FOR	LINE(S)	1260
LINE	842	USED	FOR	LINE(S)	1262
LINE	849	USED	FOR	LINE(S)	1263
LINE	851	USED	FOR	LINE(S)	1264
LINE	852	USED	FOR	LINE(S)	1271
LINE	853	USED	FOR	LINE(S)	1273
LINE	857	USED	FOR	LINE(S)	1276
LINE	858	USED	FOR	LINE(S)	1278
LINE	942	USED	FOR	LINE(S)	1346
LINE	946	USED	FOR	LINE(S)	1345
LINE	947	USED	FOR	LINE(S)	1347
LINE	956	USED	FOR	LINE(S)	1365
LINE	959	USED	FOR	LINE(S)	1366
LINE	968	USED	FOR	LINE(S)	1383
LINE	969	USED	FOR	LINE(S)	1381
LINE	970	USED	FOR	LINE(S)	1384
LINE	978	USED	FOR	LINE(S)	1392
LINE	979	USED	FOR	LINE(S)	1394
LINE	989	USED	FOR	LINE(S)	1404
LINE	990	USED	FOR	LINE(S)	1402
LINE	991	USED	FOR	LINE(S)	1405
LINE	999	USED	FOR	LINE(S)	1413
LINE	1000	USED	FOR	LINE(S)	1415
LINE	1085	USED	FOR	LINE(S)	1494
LINE	1088	USED	FOR	LINE(S)	1495
LINE	1097	USED	FOR	LINE(S)	1506
LINE	1100	USED	FOR	LINE(S)	1507
LINE	1109	USED	FOR	LINE(S)	1518
LINE	1112	USED	FOR	LINE(S)	1519
LINE	1118	USED	FOR	LINE(S)	1532

LINE	1119	USED FOR LINE(S)	1534
LINE	1126	USED FOR LINE(S)	1540
LINE	1127	USED FOR LINE(S)	1542
LINE	1134	USED FOR LINE(S)	1548
LINE	1135	USED FOR LINE(S)	1550
LINE	1142	USED FOR LINE(S)	1556
LINE	1143	USED FOR LINE(S)	1558
LINE	1150	USED FOR LINE(S)	1564
LINE	1151	USED FOR LINE(S)	1566
LINE	1158	USED FOR LINE(S)	1572
LINE	1159	USED FOR LINE(S)	1574
LINE	1165	USED FOR LINE(S)	1578
LINE	1167	USED FOR LINE(S)	1579
LINE	1168	USED FOR LINE(S)	1588
LINE	1169	USED FOR LINE(S)	1590
LINE	1174	USED FOR LINE(S)	1594
LINE	1175	USED FOR LINE(S)	1596
LINE	1183	USED FOR LINE(S)	1597
LINE	1185	USED FOR LINE(S)	1598
LINE	1186	USED FOR LINE(S)	1605
LINE	1187	USED FOR LINE(S)	1607
LINE	1191	USED FOR LINE(S)	1610
LINE	1192	USED FOR LINE(S)	1612
LINE	1199	USED FOR LINE(S)	1613
LINE	1201	USED FOR LINE(S)	1614
LINE	1202	USED FOR LINE(S)	1621
LINE	1203	USED FOR LINE(S)	1623
LINE	1207	USED FOR LINE(S)	1626
LINE	1208	USED FOR LINE(S)	1628
LINE	1216	USED FOR LINE(S)	1629
LINE	1218	USED FOR LINE(S)	1630
LINE	1219	USED FOR LINE(S)	1639
LINE	1220	USED FOR LINE(S)	1641
LINE	1225	USED FOR LINE(S)	1645
LINE	1226	USED FOR LINE(S)	1647
LINE	1234	USED FOR LINE(S)	1648
LINE	1236	USED FOR LINE(S)	1649
LINE	1237	USED FOR LINE(S)	1656
LINE	1238	USED FOR LINE(S)	1658
LINE	1242	USED FOR LINE(S)	1661
LINE	1243	USED FOR LINE(S)	1663
LINE	1250	USED FOR LINE(S)	1664
LINE	1252	USED FOR LINE(S)	1665
LINE	1253	USED FOR LINE(S)	1672
LINE	1254	USED FOR LINE(S)	1674
LINE	1258	USED FOR LINE(S)	1677
LINE	1259	USED FOR LINE(S)	1679
LINE	1266	USED FOR LINE(S)	1680
LINE	1268	USED FOR LINE(S)	1681
LINE	1269	USED FOR LINE(S)	1688
LINE	1270	USED FOR LINE(S)	1690
LINE	1274	USED FOR LINE(S)	1693
LINE	1275	USED FOR LINE(S)	1695
AREA	89	USED FOR AREA(S)	1148
AREA	102	USED FOR AREA(S)	423
AREA	105	USED FOR AREA(S)	1161
AREA	118	USED FOR AREA(S)	439
AREA	124	USED FOR AREA(S)	1168
AREA	127	USED FOR AREA(S)	453
AREA	133	USED FOR AREA(S)	1176
AREA	136	USED FOR AREA(S)	462
AREA	142	USED FOR AREA(S)	1184
AREA	145	USED FOR AREA(S)	469
AREA	151	USED FOR AREA(S)	1192
AREA	154	USED FOR AREA(S)	478
AREA	169	USED FOR AREA(S)	1347
AREA	178	USED FOR AREA(S)	633
AREA	185	USED FOR AREA(S)	640
AREA	194	USED FOR AREA(S)	1350
AREA	201	USED FOR AREA(S)	645

AREA	210	USED FOR AREA(S)	1355
AREA	217	USED FOR AREA(S)	1277
AREA	219	USED FOR AREA(S)	1362
AREA	228	USED FOR AREA(S)	648
AREA	230	USED FOR AREA(S)	555
AREA	233	USED FOR AREA(S)	1289
AREA	235	USED FOR AREA(S)	654
AREA	244	USED FOR AREA(S)	1364
AREA	246	USED FOR AREA(S)	567
AREA	249	USED FOR AREA(S)	1301
AREA	251	USED FOR AREA(S)	658
AREA	260	USED FOR AREA(S)	1368
AREA	262	USED FOR AREA(S)	579
AREA	265	USED FOR AREA(S)	1374
AREA	268	USED FOR AREA(S)	1307
AREA	271	USED FOR AREA(S)	593
AREA	274	USED FOR AREA(S)	660
AREA	277	USED FOR AREA(S)	1314
AREA	280	USED FOR AREA(S)	600
AREA	283	USED FOR AREA(S)	666
AREA	286	USED FOR AREA(S)	1321
AREA	289	USED FOR AREA(S)	607
AREA	292	USED FOR AREA(S)	1376
AREA	295	USED FOR AREA(S)	1328
AREA	298	USED FOR AREA(S)	614
AREA	301	USED FOR AREA(S)	670
AREA	304	USED FOR AREA(S)	1335
AREA	307	USED FOR AREA(S)	621
AREA	310	USED FOR AREA(S)	1380
AREA	313	USED FOR AREA(S)	1342
AREA	316	USED FOR AREA(S)	628
AREA	319	USED FOR AREA(S)	1386
AREA	321	USED FOR AREA(S)	672
AREA	323	USED FOR AREA(S)	679
AREA	325	USED FOR AREA(S)	1389
AREA	327	USED FOR AREA(S)	684
AREA	329	USED FOR AREA(S)	1394
AREA	331	USED FOR AREA(S)	1401
AREA	333	USED FOR AREA(S)	687
AREA	335	USED FOR AREA(S)	693
AREA	337	USED FOR AREA(S)	1403
AREA	339	USED FOR AREA(S)	697
AREA	341	USED FOR AREA(S)	1407
AREA	343	USED FOR AREA(S)	1413
AREA	345	USED FOR AREA(S)	699
AREA	347	USED FOR AREA(S)	705
AREA	349	USED FOR AREA(S)	1415
AREA	351	USED FOR AREA(S)	709
AREA	353	USED FOR AREA(S)	1419
AREA	355	USED FOR AREA(S)	1425
AREA	357	USED FOR AREA(S)	711
AREA	359	USED FOR AREA(S)	717
AREA	361	USED FOR AREA(S)	1427
AREA	363	USED FOR AREA(S)	721
AREA	365	USED FOR AREA(S)	1431
AREA	436	USED FOR AREA(S)	779
AREA	449	USED FOR AREA(S)	795
AREA	456	USED FOR AREA(S)	809
AREA	464	USED FOR AREA(S)	818
AREA	472	USED FOR AREA(S)	825
AREA	480	USED FOR AREA(S)	834
AREA	565	USED FOR AREA(S)	911
AREA	577	USED FOR AREA(S)	923
AREA	589	USED FOR AREA(S)	935
AREA	595	USED FOR AREA(S)	949
AREA	602	USED FOR AREA(S)	956
AREA	609	USED FOR AREA(S)	963
AREA	616	USED FOR AREA(S)	970
AREA	623	USED FOR AREA(S)	977
AREA	630	USED FOR AREA(S)	984

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AREA 635 USED FOR AREA(S) 989
AREA 638 USED FOR AREA(S) 996
AREA 643 USED FOR AREA(S) 1001
AREA 650 USED FOR AREA(S) 1004
AREA 652 USED FOR AREA(S) 1010
AREA 656 USED FOR AREA(S) 1014
AREA 662 USED FOR AREA(S) 1016
AREA 664 USED FOR AREA(S) 1022
AREA 668 USED FOR AREA(S) 1026
AREA 674 USED FOR AREA(S) 1028
AREA 677 USED FOR AREA(S) 1035
AREA 682 USED FOR AREA(S) 1040
AREA 689 USED FOR AREA(S) 1043
AREA 691 USED FOR AREA(S) 1049
AREA 695 USED FOR AREA(S) 1053
AREA 701 USED FOR AREA(S) 1055
AREA 703 USED FOR AREA(S) 1061
AREA 707 USED FOR AREA(S) 1065
AREA 713 USED FOR AREA(S) 1067
AREA 715 USED FOR AREA(S) 1073
AREA 719 USED FOR AREA(S) 1077
AREA 792 USED FOR AREA(S) 1135
AREA 805 USED FOR AREA(S) 1151
AREA 812 USED FOR AREA(S) 1165
AREA 820 USED FOR AREA(S) 1174
AREA 828 USED FOR AREA(S) 1181
AREA 836 USED FOR AREA(S) 1190
AREA 921 USED FOR AREA(S) 1267
AREA 933 USED FOR AREA(S) 1279
AREA 945 USED FOR AREA(S) 1291
AREA 951 USED FOR AREA(S) 1305
AREA 958 USED FOR AREA(S) 1312
AREA 965 USED FOR AREA(S) 1319
AREA 972 USED FOR AREA(S) 1326
AREA 979 USED FOR AREA(S) 1333
AREA 986 USED FOR AREA(S) 1340
AREA 991 USED FOR AREA(S) 1345
AREA 994 USED FOR AREA(S) 1352
AREA 999 USED FOR AREA(S) 1357
AREA 1006 USED FOR AREA(S) 1360
AREA 1008 USED FOR AREA(S) 1366
AREA 1012 USED FOR AREA(S) 1370
AREA 1018 USED FOR AREA(S) 1372
AREA 1020 USED FOR AREA(S) 1378
AREA 1024 USED FOR AREA(S) 1382
AREA 1030 USED FOR AREA(S) 1384
AREA 1033 USED FOR AREA(S) 1391
AREA 1038 USED FOR AREA(S) 1396
AREA 1045 USED FOR AREA(S) 1399
AREA 1047 USED FOR AREA(S) 1405
AREA 1051 USED FOR AREA(S) 1409
AREA 1057 USED FOR AREA(S) 1411
AREA 1059 USED FOR AREA(S) 1417
AREA 1063 USED FOR AREA(S) 1421
AREA 1069 USED FOR AREA(S) 1423
AREA 1071 USED FOR AREA(S) 1429
AREA 1075 USED FOR AREA(S) 1433

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Define Some LOCAL Coordinate Systems for use
 IF THE CSYS,15, WAS USED... THESE MUST BE REDEFINED TO THE
 POUR CANISTER CENTER LINES.... I.E. THE X-Y's ARE ON AXIS

```

COORDINATE SYSTEM 21 DEFINITION.. TYPE= 0 (CARTESIAN)
XC,YC,ZC= .32495 .32495 .00000E+00
ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

```

ACTIVE COORDINATE SYSTEM SET TO 21 (CARTESIAN)

COORDINATE SYSTEM 22 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= .32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 22 (CARTESIAN)

COORDINATE SYSTEM 23 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= -.32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 23 (CARTESIAN)

COORDINATE SYSTEM 24 DEFINITION. TYPE= 0 (CARTESIAN)
 XC,YC,ZC= -.32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 24 (CARTESIAN)

COORDINATE SYSTEM 31 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

COORDINATE SYSTEM 32 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= .32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

COORDINATE SYSTEM 33 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= -.32495 -.32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

COORDINATE SYSTEM 34 DEFINITION. TYPE= 1 (CYLINDRICAL)
 XC,YC,ZC= -.32495 .32495 .00000E+00
 ANGLES= .00 .00 .00 PARAMETERS= 1.000 1.000
 ORIENTATION= 1.00 .00 .00 .00 1.00 .00 .00 1.00

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #1 - ASSUME NO RAD. DONT DO

TYPE,6,
 VSEL,S,MAT,,5,
 ASEL,S,EXT,
 CSYS,31,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
 NSLA,S,1,
 ESURF,

Inner SS. Lid of Can. #1

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 CSYS,31,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,


```

CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
NSLA,S,1,
ESURF,

```

Inner SS. Side of Can. #1

```

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
CSYS,31,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0
CSYS,0,
NSLA,S,1,
ESURF,

```

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #2

```

TYPE,6,
VSEL,S,MAT,,5,
ASEL,S,EXT,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
NSLA,S,1,
ESURF,

```

Inner SS. Lid of Can. #2

```

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
NSLA,S,1,
ESURF,

```

Inner SS. Side of Can. #2

```

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
CSYS,32,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0
CSYS,0,
NSLA,S,1,
ESURF,

```

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #3

```

TYPE,6,
VSEL,S,MAT,,5,
ASEL,S,EXT,
CSYS,33,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
NSLA,S,1,
ESURF,

```

Inner SS. Lid of Can. #3

```

TYPE,6,
VSEL,S,MAT,,1,
ASEL,S,EXT,
CSYS,33,
ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
CSYS,0,
ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),

```

ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
 NSLA,S,1,
 ESURF,

Inner SS. Side of Can. #3

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
 ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
 CSYS,33,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0
 CSYS,0,
 NSLA,S,1,
 ESURF,

Define Elements for radiation

In Pour Canister First; Glass Surf. Can #4

TYPE,6,
 VSEL,S,MAT,,5,
 ASEL,S,EXT,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT6-0.0001),
 NSLA,S,1,
 ESURF,

Inner SS. Lid of Can. #4

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0,
 CSYS,0,
 ASEL,U,LOC,Z,-100.0,(TPPT5-0.0001),
 ASEL,U,LOC,Z,(TPPT5+0.0001),100.0
 NSLA,S,1,
 ESURF,

Inner SS. Side of Can. #4

TYPE,6,
 VSEL,S,MAT,,1,
 ASEL,S,EXT,
 ASEL,U,LOC,Z,-100.0,(TPPT6+0.0001)
 ASEL,U,LOC,Z,(TPPT5-0.0001),100.0,
 CSYS,34,
 ASEL,U,LOC,X,(DRMIR+0.0001),100.0
 CSYS,0,
 NSLA,S,1,
 ESURF,

Define Elements for radiation - Between Can and IB

Pour Can. Surf.

Top Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
 KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2345 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5099
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .000000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #1

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=

IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Top Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Sides Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #2

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00

KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

*** NOTE *** CP= 76.120 TIME= 16:53:00
Page file used.

NUMBER OF ELEMENTS GENERATED= 64

Top Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #3

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 33 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64

Top Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2346 AND 1.2346
KABS= 0. TOLERANCE= .617300E-02

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Sides Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.2336 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5090
KABS= 0. TOLERANCE= .000000E+00

160 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .00000E+00 AND .30470
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

20 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

160 NODES (OF 8979 DEFINED) SELECTED FROM
20 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 144
Bottom Can #4

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 1 STEP 1

112 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

224 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 34 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

56 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.5099 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

8 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

73 NODES (OF 8979 DEFINED) SELECTED FROM
8 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 64
Inner Barrier Inside Surfaces

ELEMENT TYPE SET TO 26

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 2 TO 2 STEP 1

64 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

152 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.5060 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

140 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND -1.5360

KABS= 0. TOLERANCE= .000000E+00

128 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .78550 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

80 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

962 NODES (OF 8979 DEFINED) SELECTED FROM
80 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES.
TYPE= 26 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 832

Define Elements for radiation
In Inner Barrier / Out Barrier Gap - ASSUME NO RAD. SO DONT DEFINE
Top of Inner Barrier Lid

TYPE,16,
VSEL,S,MAT,,2,
ASEL,S,EXT,
ASEL,R,LOC,Z,(TPPT2-0.001),(TPPT2+0.001),
NSLA,S,1,
ESURF,

Bottom of Outer Barrier Lid

TYPE,16,
ASEL,S,LOC,Z,(TPPT1-0.001),(TPPT1+0.001),
ASEL,U,AREA,,346,
ASEL,U,AREA,,702,
ASEL,U,AREA,,1058,
ASEL,U,AREA,,1414,
NSLA,S,1,
ESURF,

Side of Outer Barrier WP (Inside Surface)

TYPE,16,
VSEL,S,MAT,,15,
ASEL,S,EXT,
CSYS,11,
ASEL,U,LOC,X,(DCORD-IWALL),100,
CSYS,0,
ASEL,U,LOC,Z,-100,TPPT2,
ASEL,U,LOC,Z,TPPT1,100,
NSLA,S,1,
ESURF,

Define Elements for radiation
Outer Surface of Waste Package

ELEMENT TYPE SET TO 36
Bottom Lid

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -1.6160 AND -1.6140

KABS= 0. TOLERANCE= .000000E+00

12 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

337 NODES (OF 8979 DEFINED) SELECTED FROM
12 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320
Side of WP

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 11 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN -.85350 AND .85350
KABS= 0. TOLERANCE= .000000E+00

68 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

800 NODES (OF 8979 DEFINED) SELECTED FROM
68 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 768
Top Lid

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 15 TO 15 STEP 1

84 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT AREAS ON EXTERIOR OF SELECTED VOLUMES

192 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN 1.6140 AND 1.6160
KABS= 0. TOLERANCE= .000000E+00

12 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

337 NODES (OF 8979 DEFINED) SELECTED FROM
12 SELECTED AREAS BY NSLA COMMAND.

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
TYPE= 36 REAL= 1 MATERIAL= 15 ESYS= 0

NUMBER OF ELEMENTS GENERATED= 320

***** ROUTINE COMPLETED ***** CP = 97.160

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= pugls2x.db
FOR POSSIBLE RESUME FROM THIS POINT

Generate super-elements

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 16:53:32 OCT 27, 1995 CP= 107.360
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RADIATION MATRIX UTILITY (AUX12) *****

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 26 TO 26 STEP 1

1920 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

1930 NODES (OF 8979 DEFINED) SELECTED FROM
1920 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= .56700E-07

THREE DIMENSIONAL GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 100

WRITE RADIATION MATRIX TO FILE= ibrcanga.sub

*** WARNING *** CP= 107.790 TIME= 16:53:33
No space node defined. An enclosed system need not have a space node.
For an open system a space node is required to account for radiation losses.

NUMBER OF ELEMENTS= 1920 NUMBER OF NODES= 1930
DEFINE 100 RADIAL ZONES, 20200 RAYS
DEFINE THE 20200 RAY POINTS
SORT THE 20200 RAY POINTS

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10656 STEP 1

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 6174.160

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 19:27:00 OCT 27, 1995 CP= 6174.160
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RADIATION MATRIX UTILITY (AUX12) *****

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 36 TO 36 STEP 1

1408 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 46 TO 46 STEP 1

1728 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

1750 NODES (OF 8979 DEFINED) SELECTED FROM
1728 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= .56700E-07

THREE DIMENSIONAL GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 100

WRITE RADIATION MATRIX TO FILE= obrdrwga.sub

*** WARNING *** CP= 6174.780 TIME= 19:27:00
No space node defined. An enclosed system need not have a space node.
For an open system a space node is required to account for radiation losses.

NUMBER OF ELEMENTS= 1728 NUMBER OF NODES= 1750
DEFINE 100 RADIAL ZONES, 20200 RAYS
DEFINE THE 20200 RAY POINTS
SORT THE 20200 RAY POINTS

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10656 STEP 1

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 8154.680

- DO NOT DO RADITATION FOR INTERNAL P. CAN OR THE I/O B. GAP
/AUX12,
ESEL,S,TYPE,,16,
NSLE,S,
STEF,5.67E-8,
GEOM,0,
VTYPE,0,100,
WRITE,iobargap,
ESEL,ALL,
NSEL,ALL,
FINISH

```
/COM,  
/AUX12,  
ESEL,S,TYPE,,6,  
NSLE,S,  
STEF,5.67E-8,  
GEOM,0,  
VTYPE,0,100,  
WRITE,glscangap,
```

```
ALL SELECT FOR ITEM=ELEM COMPONENT=  
IN RANGE 1 TO 10656 STEP 1
```

10368 ELEMENTS (OF 10368 DEFINED) SELECTED BY ESEL COMMAND.

```
ALL SELECT FOR ITEM=NODE COMPONENT=  
IN RANGE 1 TO 10009 STEP 1
```

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

```
1  
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****  
38303 VERSION=HP 9000/7XX 20:00:04 OCT 27, 1995 CP= 8154.770  
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844
```

DHLW Glass Form Waste Package

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

```
ELEMENT TYPE SET TO 18  
SE,glscangap,  
SE,iobargap,
```

SUPERELEMENT 10657 ibrcanga NODE TOLERANCE = .10000E-03

STORE DOFS OF SUPERELEMENT 10657

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

STORE NODES OF SUPERELEMENT 10657

SUPERELEMENT 10658 obrdrwga NODE TOLERANCE = .10000E-03

STORE DOFS OF SUPERELEMENT 10658

CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL

STORE NODES OF SUPERELEMENT 10658
Delete radiation edge elements

```
SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 6 TO 6 STEP 1
```

0 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 16 TO 16 STEP 1
```

0 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 26 TO 26 STEP 1
```

1920 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

```
ALSO SELECT FOR ITEM=TYPE COMPONENT=  
IN RANGE 36 TO 36 STEP 1
```

3328 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 46 TO 46 STEP 1

3648 ELEMENTS (OF 10370 DEFINED) SELECTED BY ESEL COMMAND.

DELETE ALL SELECTED ELEMENTS.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 1695 STEP 1

1359 LINES (OF 1359 DEFINED) SELECTED BY LSEL COMMAND.

Define SHELL Element thicknesses; Required for solution:

REAL CONSTANT SET 1 ITEMS 1 TO 6
.10000E-02 .10000E-02 .10000E-02 .10000E-02 .00000E+00 .00000E+00

***** ROUTINE COMPLETED ***** CP = 8157.540

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= pugls2x.db
FOR POSSIBLE RESUME FROM THIS POINT

GAPs in WP between glass, can, Inner Barrier and Outer Barrier.....

DONT MESH; Either Assume its VOID or its meshed earlier

This section used only if both rad. and He conducti
is used in the model.

He/Air in WP I/O Bar. Gap

/PREP7
ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 96, 97,1
VMESH,197,198,1
VMESH,298,299,1
VMESH,399,400,1

Now Mesh inside of WP; DONT MESH Assume VOID
He space in WP

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 17, 24,1
VMESH,118,125,1
VMESH,219,226,1
VMESH,320,327,1

VMESH, 57, 68,1
VMESH,158,169,1
VMESH,259,270,1
VMESH,360,371,1

VMESH, 81,
VMESH,182,
VMESH,283,
VMESH,384,

VMESH, 90,
VMESH,191,

VMESH,292,
VMESH,393,

Now Mesh inside of Can DONT MESH Assume VOID
He/Air in Pour Can.

ESHAPE,2,
MAT, 7,
TYPE,2,
VMESH, 37, 40,1
VMESH,138,141,1
VMESH,239,242,1
VMESH,340,343,1

NUMMRG,ELEM,
NUMMRG,NODE,
NUMMRG,KP,
FINISH

Create element mesh plots to illustrate model

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 20:00:19 OCT 27, 1995 CP= 8167.060
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW Glass Form Waste Package

***** ANSYS RESULTS INTERPRETATION (POST1) *****
View model meshing from drift end view

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 .00000E+00 .00000E+00 1.0000

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

164 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3072 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
164 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=Z BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

5 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3232 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
5 SELECTED AREAS BY ESLA COMMAND.

TITLE=

DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshfct.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshfct.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP FRONT CUT AWAY VIEW OF MESH
View model meshing for 45 side cut-away

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 1.0000 1.0000

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 135.00
KABS= 0. TOLERANCE= .000000E+00

18 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

240 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
18 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 45.000
KABS= 0. TOLERANCE= .000000E+00

27 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

600 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
27 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3800 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3992 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

TITLE=
DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshcut.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshcut.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP CUT AWAY VIEW OF MESH
View model meshing for 90 side cut-away

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 .00000E+00 .00000E+00

DISTANCE FOR WINDOW 1 5.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3200 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .00000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3392 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

TITLE=
DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

/SHOW SWITCH PLOTS TO FILE meshsct.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshsct.grph - RASTER MODE.
DISPLAY TITLE=
DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED ***** CP = 8176.850

Set solution parameters and apply B.C.'s

Solve steady-state for initial conditions
with WP surface equal to drift ambient
temperature from repository model.

***** ANSYS SOLUTION ROUTINE *****

PERFORM A TRANSIENT ANALYSIS
THIS WILL BE A NEW ANALYSIS

USE THE DEFAULT NEWTON-RAPHSON OPTION FOR ALL DOFS
AND USE THE DEFAULT ADAPTIVE DESCENT OPTION

*** NOTE *** CP= 8176.850 TIME= 20:00:29
Damping (if present) may be ignored only in reduced transient analyses.

PERFORM A FULL TRANSIENT ANALYSIS

TEMPERATURE OFFSET FROM ABSOLUTE ZERO= 273.150
Apply Drift Wall Temp. BC

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1379438 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=

IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.
Apply Heat Generation BC to glass

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1152.94131 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.
Set Solution Params and solve

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= .10000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE COMMAND *****

*** NOTE *** CP= 8179.210 TIME= 20:00:32

All shape tests were bypassed for elements associated with the solid
model, because most of them were already done at AMESH or VMESH. Use
CHECK if desired to perform all of the element tests.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 20:00:32 OCT 27, 1995 CP= 8179.210
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

SOLUTION OPTIONS

PROBLEM DIMENSIONALITY. 3-D
DEGREES OF FREEDOM. TEMP
ANALYSIS TYPE. TRANSIENT
SOLUTION METHOD. FULL
OFFSET TEMPERATURE FROM ABSOLUTE ZERO. 273.15
NEWTON-RAPHSON OPTION. PROGRAM CHOSEN

*** NOTE *** CP= 8180.650 TIME= 20:00:33
This load step will be a static (steady-state) step.

*** NOTE *** CP= 8181.090 TIME= 20:00:34
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

LOAD STEP OPTIONS

LOAD STEP NUMBER. 1
TIME AT END OF THE LOAD STEP. 10000E-05
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

***** CENTROID, MASS, AND MASS MOMENTS OF INERTIA *****

CALCULATIONS ASSUME ELEMENT MASS AT ELEMENT CENTROID

TOTAL MASS = 19821.

CENTROID	MOM. OF INERTIA ABOUT ORIGIN	MOM. OF INERTIA ABOUT CENTROID
XC = -.47040E-12	IXX = .2730E+05	IXX = .2701E+05
YC = -.10514E-01	IYY = .2709E+05	IYY = .2680E+05
ZC = -.12014	IZZ = 9810.	IZZ = 9808.
	IXY = .8715E-08	IXY = .8813E-08
	IYZ = .4597E-10	IYZ = 25.04
	IZX = -.2955E-08	IZX = -.1835E-08

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
2	19692.2
11	129.199

Range of element maximum matrix coefficients in global coordinates
Maximum= 11.1632414 at element 4464.
Minimum= 4.837293208E-09 at element 10657.

*** WARNING *** CP= 8219.900 TIME= 20:02:06
Coefficient ratio exceeds 1.0e8 - Check results.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	22.140	.003
11	320	SHELL57	.790	.002
18	2	MATRIX50	5.750	2.875

Time at end of element matrix formulation CP= 8219.9.

HT FLOW CONVERGENCE VALUE= 142.4 CRITERION= .1424

Estimated number of active DOF= 8639.

Maximum wavefront= 2002.

Time at end of matrix triangularization CP= 9293.82.
 Equation solver maximum pivot= 45.7732646 at node 8097 TEMP.
 Equation solver minimum pivot= 0.217830495 at node 3498 TEMP.
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 158.0
 HT FLOW CONVERGENCE VALUE= 286.9 CRITERION= .7787E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -39.51
 HT FLOW CONVERGENCE VALUE= 29.60 CRITERION= .7787E-01
 EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -7.512
 HT FLOW CONVERGENCE VALUE= 4.921 CRITERION= .7787E-01
 EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4217
 HT FLOW CONVERGENCE VALUE= .2660 CRITERION= .7787E-01
 EQUIL ITER 5 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .8979E-01
 HT FLOW CONVERGENCE VALUE= .5796E-01 CRITERION= .7787E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 5

*** ELEMENT RESULT CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	13.990	.002
11	320	SHELL57	.430	.001
18	2	MATRIX50	8.690	4.345

*** NODAL LOAD CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
2	6400	SOLID70	1.520	.000
11	320	SHELL57	.040	.000
18	2	MATRIX50	.000	.000

*** LOAD STEP 1 SUBSTEP 1 COMPLETED. CUM ITER = 5
 *** TIME = .100000E-05 TIME INC = .100000E-05

*** PROBLEM STATISTICS
 ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM = 8639
 R.M.S. WAVEFRONT SIZE = 964.8

*** ANSYS BINARY FILE STATISTICS
 BUFFER SIZE USED= 4096
 57.625 MB WRITTEN ON ELEMENT MATRIX FILE: pugls2x.emat
 5.953 MB WRITTEN ON ELEMENT SAVED DATA FILE: pugls2x.esav
 58.766 MB WRITTEN ON TRIANGULARIZED MATRIX FILE: pugls2x.tri
 .047 MB WRITTEN ON SUBSTRUCTURE DOF SOLUTION FILE: pugls2x.dsub
 5.297 MB WRITTEN ON RESULTS FILE: pugls2x.rth

Solve steady-state for initial conditions
 with WP surface temperatures from repository
 steady-state solution.
 Apply Drift Wall Temp. BC

SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
 KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
 10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
 RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1383000 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.
Apply Heat Generation BC to glass

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1152.94131 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.
Set Solution Params and solve

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= .20000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 13773.590 TIME= 21:51:01
This load step will be a static (steady-state) step.

*** NOTE *** CP= 13774.030 TIME= 21:51:01
The step data was checked and warning messages were found.
Please review output or errors file (pugls2x.err) for these warning messages.

*** NOTE *** CP= 13774.040 TIME= 21:51:01
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 21:51:01 OCT 27, 1995 CP= 13774.040
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 2
TIME AT END OF THE LOAD STEP. 20000E-05
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= .5799E-01 CRITERION= .7787E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .5310E-02
HT FLOW CONVERGENCE VALUE= .2961E-02 CRITERION= .7787E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 2 SUBSTEP 1 COMPLETED. CUM ITER = 6
*** TIME = .200000E-05 TIME INC = .100000E-05

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= pugls2x.db
FOR POSSIBLE RESUME FROM THIS POINT

SOLVE A SET OF STEADY STATE POINTS FOR GRINS AND GIGGLES

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

Time substep ranges from 10 sec to 1/4 loadstep
NSUBST,10,20,5,ON
Begin Transient
Apply loads and solve for 0 to .9 years

*DO LOOP ON PARAMETER= TM FROM 31.558 TO .28402E+08 BY .31558E+07

TIME= 31.558

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1152.94131 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 26.1383000 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING ***

CP= 14063.980 TIME= 22:01:32

This load step will be a static (steady-state) step.

*** NOTE *** CP= 14064.420 TIME= 22:01:33
The step data was checked and warning messages were found.
Please review output or errors file (pugls2x.err) for these warning messages.

*** NOTE *** CP= 14064.420 TIME= 22:01:33
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:01:33 OCT 27, 1995 CP= 14064.420
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 3
TIME AT END OF THE LOAD STEP. 31.558
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= .2961E-02 CRITERION= .7787E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1069E-02
HT FLOW CONVERGENCE VALUE= .6827E-03 CRITERION= .7787E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 3 SUBSTEP 1 COMPLETED. CUM ITER = 7
*** TIME = 31.5576 TIME INC = 31.5576

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 14337.660 TIME= 22:11:37
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:11:37 OCT 27, 1995 CP= 14338.110
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 135.8 CRITERION= .1565
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 20.28
HT FLOW CONVERGENCE VALUE= 20.15 CRITERION= .7775E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -3.851
HT FLOW CONVERGENCE VALUE= 2.242 CRITERION= .7775E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1967
HT FLOW CONVERGENCE VALUE= .9661E-01 CRITERION= .7775E-01
EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .2942E-01
HT FLOW CONVERGENCE VALUE= .1813E-01 CRITERION= .7775E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 4
*** LOAD STEP 4 SUBSTEP 1 COMPLETED. CUM ITER = 11

*** TIME = .315579E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 15170.140 TIME= 22:40:26
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 22:40:27 OCT 27, 1995 CP= 15170.580
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 70.65 CRITERION= .1050
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 8.872
HT FLOW CONVERGENCE VALUE= 8.656 CRITERION= .7763E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.615
HT FLOW CONVERGENCE VALUE= .9293 CRITERION= .7763E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.7328E-01
HT FLOW CONVERGENCE VALUE= .3575E-01 CRITERION= .7763E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 5 SUBSTEP 1 COMPLETED. CUM ITER = 14
*** TIME = .631155E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 15810.310 TIME= 23:02:55
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:02:55 OCT 27, 1995 CP= 15810.760
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 51.98 CRITERION= .9333E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 6.064
HT FLOW CONVERGENCE VALUE= 5.827 CRITERION= .7751E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.064
HT FLOW CONVERGENCE VALUE= .6022 CRITERION= .7751E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4545E-01
HT FLOW CONVERGENCE VALUE= .2181E-01 CRITERION= .7751E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 6 SUBSTEP 1 COMPLETED. CUM ITER = 17
*** TIME = .946731E+07 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 16449.620 TIME= 23:25:21
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:25:21 OCT 27, 1995 CP= 16450.060
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 42.36 CRITERION= .8823E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 4.702
HT FLOW CONVERGENCE VALUE= 4.466 CRITERION= .7740E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.8011
HT FLOW CONVERGENCE VALUE= .4465 CRITERION= .7740E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3272E-01
HT FLOW CONVERGENCE VALUE= .1547E-01 CRITERION= .7740E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 7 SUBSTEP 1 COMPLETED. CUM ITER = 20
*** TIME = .126231E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 17088.820 TIME= 23:47:50
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 23:47:51 OCT 27, 1995 CP= 17089.260
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 36.17 CRITERION= .8532E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.864
HT FLOW CONVERGENCE VALUE= 3.637 CRITERION= .7728E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.6421
HT FLOW CONVERGENCE VALUE= .3532 CRITERION= .7728E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2531E-01
HT FLOW CONVERGENCE VALUE= .1181E-01 CRITERION= .7728E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 8 SUBSTEP 1 COMPLETED. CUM ITER = 23
*** TIME = .157788E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 17728.470 TIME= 00:10:16
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:10:17 OCT 28, 1995 CP= 17728.910
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 31.79 CRITERION= .8345E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.293
HT FLOW CONVERGENCE VALUE= 3.073 CRITERION= .7716E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5354
HT FLOW CONVERGENCE VALUE= .2910 CRITERION= .7716E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2034E-01
HT FLOW CONVERGENCE VALUE= .9445E-02 CRITERION= .7716E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 9 SUBSTEP 1 COMPLETED. CUM ITER = 26
*** TIME = .189346E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 18368.320 TIME= 00:32:44
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:32:45 OCT 28, 1995 CP= 18368.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 28.56 CRITERION= .8217E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.882
HT FLOW CONVERGENCE VALUE= 2.659 CRITERION= .7705E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4597
HT FLOW CONVERGENCE VALUE= .2399 CRITERION= .7705E-01

EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1699E-01
HT FLOW CONVERGENCE VALUE= .8064E-02 CRITERION= .7705E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 10 SUBSTEP 1 COMPLETED. CUM ITER = 29
*** TIME = .220904E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 19009.820 TIME= 00:55:11
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 00:55:11 OCT 28, 1995 CP= 19010.270
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 25.80 CRITERION= .8114E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.545
HT FLOW CONVERGENCE VALUE= 2.238 CRITERION= .7693E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3993
HT FLOW CONVERGENCE VALUE= .1945 CRITERION= .7693E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1438E-01
HT FLOW CONVERGENCE VALUE= .7192E-02 CRITERION= .7693E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 11 SUBSTEP 1 COMPLETED. CUM ITER = 32
*** TIME = .252461E+08 TIME INC = .315576E+07

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 19657.400 TIME= 01:17:45
This load step will be a static (steady-state) step.

1
***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:17:45 OCT 28, 1995 CP= 19657.850
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 23.68 CRITERION= .8038E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.289
HT FLOW CONVERGENCE VALUE= 1.960 CRITERION= .7681E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3539
HT FLOW CONVERGENCE VALUE= .1694 CRITERION= .7681E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1247E-01
HT FLOW CONVERGENCE VALUE= .6247E-02 CRITERION= .7681E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 12 SUBSTEP 1 COMPLETED. CUM ITER = 35
*** TIME = .284019E+08 TIME INC = .315576E+07

NSUBST,10,25,10,ON

Apply loads and solve for 1 to 9 years

*DO LOOP ON PARAMETER= TM FROM .31558E+08 TO .28402E+09 BY .31558E+08

TIME= .31558E+08

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1135.57848 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 83.0314775 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 20306.990 TIME= 01:40:21
This load step will be a static (steady-state) step.

*** NOTE *** CP= 20307.430 TIME= 01:40:22
The step data was checked and warning messages were found.

Please review output or errors file (pugls2x.err) for these warning messages.

*** NOTE *** CP= 20307.430 TIME= 01:40:22
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 01:40:22 OCT 28, 1995 CP= 20307.430
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 13
TIME AT END OF THE LOAD STEP. 31558E+08
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 22.11 CRITERION= .7982E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.099
HT FLOW CONVERGENCE VALUE= 1.778 CRITERION= .7670E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3200
HT FLOW CONVERGENCE VALUE= .1517 CRITERION= .7670E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1082E-01
HT FLOW CONVERGENCE VALUE= .5503E-02 CRITERION= .7670E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 13 SUBSTEP 1 COMPLETED. CUM ITER = 38
*** TIME = .315576E+08 TIME INC = .315576E+07

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 20956.620 TIME= 02:02:58
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:02:59 OCT 28, 1995 CP= 20957.060
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 158.3 CRITERION= .1754
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 14.79
HT FLOW CONVERGENCE VALUE= 9.508 CRITERION= .7555E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.999
HT FLOW CONVERGENCE VALUE= .8836 CRITERION= .7555E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5984E-01
HT FLOW CONVERGENCE VALUE= .2877E-01 CRITERION= .7555E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 14 SUBSTEP 1 COMPLETED. CUM ITER = 41
*** TIME = .631152E+08 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 21602.060 TIME= 02:25:30
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:25:30 OCT 28, 1995 CP= 21602.500
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 112.8 CRITERION= .1351
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 9.406
HT FLOW CONVERGENCE VALUE= 5.654 CRITERION= .7443E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.187
HT FLOW CONVERGENCE VALUE= .5018 CRITERION= .7443E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3173E-01
HT FLOW CONVERGENCE VALUE= .1507E-01 CRITERION= .7443E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 15 SUBSTEP 1 COMPLETED. CUM ITER = 44
*** TIME = .946728E+08 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 22254.840 TIME= 02:48:08
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 02:48:09 OCT 28, 1995 CP= 22255.280
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 94.79 CRITERION= .1198
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 7.372
HT FLOW CONVERGENCE VALUE= 4.035 CRITERION= .7334E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.8761
HT FLOW CONVERGENCE VALUE= .3383 CRITERION= .7334E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2162E-01
HT FLOW CONVERGENCE VALUE= .1036E-01 CRITERION= .7334E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 16 SUBSTEP 1 COMPLETED. CUM ITER = 47
*** TIME = .126230E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 22899.770 TIME= 03:10:40
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 03:10:40 OCT 28, 1995 CP= 22900.210
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 85.93 CRITERION= .1123
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 6.331
HT FLOW CONVERGENCE VALUE= 3.325 CRITERION= .7227E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.7135
HT FLOW CONVERGENCE VALUE= .2662 CRITERION= .7227E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1649E-01
HT FLOW CONVERGENCE VALUE= .7639E-02 CRITERION= .7227E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 17 SUBSTEP 1 COMPLETED. CUM ITER = 50

*** TIME = .157788E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 23551.210 TIME= 03:33:19
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 03:33:19 OCT 28, 1995 CP= 23551.650
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 75.49 CRITERION= .1038
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 5.314
HT FLOW CONVERGENCE VALUE= 2.737 CRITERION= .7122E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.5713
HT FLOW CONVERGENCE VALUE= .2063 CRITERION= .7122E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1247E-01
HT FLOW CONVERGENCE VALUE= .5619E-02 CRITERION= .7122E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 18 SUBSTEP 1 COMPLETED. CUM ITER = 53
*** TIME = .189346E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 24203.270 TIME= 03:55:55
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 03:55:55 OCT 28, 1995 CP= 24203.710
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 64.87 CRITERION= .9558E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 4.397
HT FLOW CONVERGENCE VALUE= 2.234 CRITERION= .7020E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4536
HT FLOW CONVERGENCE VALUE= .1595 CRITERION= .7020E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .9533E-02
HT FLOW CONVERGENCE VALUE= .4158E-02 CRITERION= .7020E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 19 SUBSTEP 1 COMPLETED. CUM ITER = 56
*** TIME = .220903E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 24856.190 TIME= 04:18:33
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 04:18:34 OCT 28, 1995 CP= 24856.640
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 59.34 CRITERION= .9116E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 3.899
HT FLOW CONVERGENCE VALUE= 1.942 CRITERION= .6920E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.3876
HT FLOW CONVERGENCE VALUE= .1329 CRITERION= .6920E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7989E-02
HT FLOW CONVERGENCE VALUE= .3321E-02 CRITERION= .6920E-01 <<< CONVERGED

```
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 20 SUBSTEP 1 COMPLETED. CUM ITER = 59
*** TIME = .252461E+09 TIME INC = .315576E+08

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 25501.530 TIME= 04:41:05
This load step will be a static (steady-state) step.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 04:41:06 OCT 28, 1995 CP= 25501.970
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 46.38 CRITERION= .8249E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.965
HT FLOW CONVERGENCE VALUE= 1.436 CRITERION= .6822E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2849
HT FLOW CONVERGENCE VALUE= .9588E-01 CRITERION= .6822E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .5934E-02
HT FLOW CONVERGENCE VALUE= .2327E-02 CRITERION= .6822E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 21 SUBSTEP 1 COMPLETED. CUM ITER = 62
*** TIME = .284018E+09 TIME INC = .315576E+08
NSUBST,17,40,15,ON
Apply loads and solve for 10 to 90 years

*DO LOOP ON PARAMETER= TM FROM .31558E+09 TO .28402E+10 BY .31558E+09
TIME= .31558E+09

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
996.015384 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1
```

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 139.973714 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 26154.220 TIME= 05:03:44
This load step will be a static (steady-state) step.

*** NOTE *** CP= 26154.660 TIME= 05:03:45
The step data was checked and warning messages were found.
Please review output or errors file (pugls2x.err) for these warning
messages.

*** NOTE *** CP= 26154.670 TIME= 05:03:45
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 05:03:45 OCT 28, 1995 CP= 26154.670
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 22
TIME AT END OF THE LOAD STEP. 31558E+09
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF

TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 39.46 CRITERION= .7798E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.472
HT FLOW CONVERGENCE VALUE= 1.167 CRITERION= .6727E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2306
HT FLOW CONVERGENCE VALUE= .7614E-01 CRITERION= .6727E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .4802E-02
HT FLOW CONVERGENCE VALUE= .1802E-02 CRITERION= .6727E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 22 SUBSTEP 1 COMPLETED. CUM ITER = 65
*** TIME = .315576E+09 TIME INC = .315576E+08

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 26799.310 TIME= 05:26:15
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 05:26:15 OCT 28, 1995 CP= 26799.760
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 289.1 CRITERION= .2949
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 17.80
HT FLOW CONVERGENCE VALUE= 5.497 CRITERION= .5883E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.187
HT FLOW CONVERGENCE VALUE= .3183 CRITERION= .5883E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1951E-01
HT FLOW CONVERGENCE VALUE= .5885E-02 CRITERION= .5883E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 23 SUBSTEP 1 COMPLETED. CUM ITER = 68
*** TIME = .631152E+09 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 27452.490 TIME= 05:48:53
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 05:48:53 OCT 28, 1995 CP= 27452.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 209.7 CRITERION= .2160
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 11.46
HT FLOW CONVERGENCE VALUE= 3.084 CRITERION= .5210E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.6535
HT FLOW CONVERGENCE VALUE= .1527 CRITERION= .5210E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .9611E-02
HT FLOW CONVERGENCE VALUE= .2307E-02 CRITERION= .5210E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 24 SUBSTEP 1 COMPLETED. CUM ITER = 71
*** TIME = .946728E+09 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 28103.990 TIME= 06:11:31
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 06:11:31 OCT 28, 1995 CP= 28104.440
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 100.2 CRITERION= .1105
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 5.080
HT FLOW CONVERGENCE VALUE= 1.270 CRITERION= .4672E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.2532
HT FLOW CONVERGENCE VALUE= .5801E-01 CRITERION= .4672E-01
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3856E-02
HT FLOW CONVERGENCE VALUE= .7272E-03 CRITERION= .4672E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 25 SUBSTEP 1 COMPLETED. CUM ITER = 74
*** TIME = .126230E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 28756.000 TIME= 06:34:10
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 06:34:10 OCT 28, 1995 CP= 28756.450
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 47.98 CRITERION= .6390E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 2.349
HT FLOW CONVERGENCE VALUE= .5412 CRITERION= .4242E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1024
HT FLOW CONVERGENCE VALUE= .2261E-01 CRITERION= .4242E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 26 SUBSTEP 1 COMPLETED. CUM ITER = 76
*** TIME = .157788E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 29216.190 TIME= 06:50:28
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 06:50:28 OCT 28, 1995 CP= 29216.640
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 21.69 CRITERION= .4448E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.212
HT FLOW CONVERGENCE VALUE= .2423 CRITERION= .3898E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.4129E-01
HT FLOW CONVERGENCE VALUE= .8850E-02 CRITERION= .3898E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 1 COMPLETED. CUM ITER = 78
*** TIME = .189346E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 29682.100 TIME= 07:06:50
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 07:06:50 OCT 28, 1995 CP= 29682.550
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 4.248 CRITERION= .3636E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.624
HT FLOW CONVERGENCE VALUE= .1611 CRITERION= .3622E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -.1411E-01
HT FLOW CONVERGENCE VALUE= .2002E-02 CRITERION= .3622E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 28 SUBSTEP 1 COMPLETED. CUM ITER = 80
*** TIME = .220903E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 30142.530 TIME= 07:23:08
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 07:23:09 OCT 28, 1995 CP= 30142.970
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 14.34 CRITERION= .3683E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.090
HT FLOW CONVERGENCE VALUE= .2602 CRITERION= .3399E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3341E-01
HT FLOW CONVERGENCE VALUE= .4272E-02 CRITERION= .3399E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 29 SUBSTEP 1 COMPLETED. CUM ITER = 82
*** TIME = .252461E+10 TIME INC = .315576E+09

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 30607.870 TIME= 07:39:31
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 07:39:31 OCT 28, 1995 CP= 30608.310
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 15.16 CRITERION= .3555E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.863
HT FLOW CONVERGENCE VALUE= .2389 CRITERION= .3220E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3319E-01
HT FLOW CONVERGENCE VALUE= .4178E-02 CRITERION= .3220E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 30 SUBSTEP 1 COMPLETED. CUM ITER = 84
*** TIME = .284018E+10 TIME INC = .315576E+09
NSUBST,22,60,20,ON

Apply loads and solve for 100 to 1000 years

*DO LOOP ON PARAMETER= TM FROM .31558E+10 TO .31558E+11 BY .31558E+10
TIME= .31558E+10

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 5 TO 5 STEP 1

32 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

960 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
32 SELECTED VOLUMES BY ESLV COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
455.329067 .000000000E+00 .000000000E+00 .000000000E+00

ALL SELECT FOR ITEM=VOLU COMPONENT=
IN RANGE 1 TO 404 STEP 1

404 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 10009 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 340

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ALL NODES (INTERIOR TO AREA, INTERIOR TO LINES, AND AT
KEYPOINTS) RELATED TO SELECTED AREA SET.

340 NODES (OF 8979 DEFINED) SELECTED FROM
10 SELECTED AREAS BY NSLA COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 10009 BY 1
REAL= 175.696156 IMAG= .000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 1434 STEP 1

1290 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 10009 STEP 1

8979 NODES (OF 8979 DEFINED) SELECTED BY NSEL COMMAND.

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31073.270 TIME= 07:55:53
This load step will be a static (steady-state) step.

*** NOTE *** CP= 31073.710 TIME= 07:55:53
The step data was checked and warning messages were found.
Please review output or errors file (pugls2x.err) for these warning messages.

*** NOTE *** CP= 31073.720 TIME= 07:55:53
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 07:55:53 OCT 28, 1995 CP= 31073.720
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

LOAD STEP OPTIONS

LOAD STEP NUMBER. 31
TIME AT END OF THE LOAD STEP. 31558E+10
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 0
MAXIMUM NUMBER OF SUBSTEPS 0
MINIMUM NUMBER OF SUBSTEPS 1
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS OFF
TERMINATE ANALYSIS IF NOT CONVERGED YES (EXIT)
CONVERGENCE CONTROLS. USE DEFAULTS
PRINT OUTPUT CONTROLS NO PRINTOUT
DATABASE OUTPUT CONTROLS. ALL DATA WRITTEN
FOR THE LAST SUBSTEP

HT FLOW CONVERGENCE VALUE= 15.53 CRITERION= .3442E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.670
HT FLOW CONVERGENCE VALUE= .2208 CRITERION= .3075E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .3241E-01
HT FLOW CONVERGENCE VALUE= .4014E-02 CRITERION= .3075E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 31 SUBSTEP 1 COMPLETED. CUM ITER = 86
*** TIME = .315576E+10 TIME INC = .315576E+09

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31539.120 TIME= 08:12:16
This load step will be a static (steady-state) step.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 08:12:17 OCT 28, 1995 CP= 31539.560
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 91.30 CRITERION= .9450E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -8.054
HT FLOW CONVERGENCE VALUE= .7090 CRITERION= .2503E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1212
HT FLOW CONVERGENCE VALUE= .1232E-01 CRITERION= .2503E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 32 SUBSTEP 1 COMPLETED. CUM ITER = 88
*** TIME = .631152E+10 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 31999.810 TIME= 08:28:34
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 08:28:34 OCT 28, 1995 CP= 32000.250
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 88.25 CRITERION= .9139E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -5.188
HT FLOW CONVERGENCE VALUE= .7407 CRITERION= .2376E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .1427
HT FLOW CONVERGENCE VALUE= .1466E-01 CRITERION= .2376E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 1 COMPLETED. CUM ITER = 90
*** TIME = .946728E+10 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 32465.480 TIME= 08:44:56
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 08:44:57 OCT 28, 1995 CP= 32465.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 45.28 CRITERION= .5084E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.731
HT FLOW CONVERGENCE VALUE= .4029 CRITERION= .2312E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7598E-01
HT FLOW CONVERGENCE VALUE= .7666E-02 CRITERION= .2312E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 34 SUBSTEP 1 COMPLETED. CUM ITER = 92
*** TIME = .126230E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 32926.000 TIME= 09:01:14
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 09:01:14 OCT 28, 1995 CP= 32926.450
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 28.69 CRITERION= .3655E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.802
HT FLOW CONVERGENCE VALUE= .2598 CRITERION= .2265E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .4867E-01
HT FLOW CONVERGENCE VALUE= .4848E-02 CRITERION= .2265E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 35 SUBSTEP 1 COMPLETED. CUM ITER = 94
*** TIME = .157788E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 33391.670 TIME= 09:17:35
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 09:17:36 OCT 28, 1995 CP= 33392.120
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= .4024E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.014
HT FLOW CONVERGENCE VALUE= .3006 CRITERION= .2226E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .5700E-01
HT FLOW CONVERGENCE VALUE= .5656E-02 CRITERION= .2226E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 36 SUBSTEP 1 COMPLETED. CUM ITER = 96
*** TIME = .189346E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 33856.690 TIME= 09:33:58
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 09:33:58 OCT 28, 1995 CP= 33857.130
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 39.85 CRITERION= .4548E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.336
HT FLOW CONVERGENCE VALUE= .3565 CRITERION= .2192E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .6845E-01
HT FLOW CONVERGENCE VALUE= .6776E-02 CRITERION= .2192E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 37 SUBSTEP 1 COMPLETED. CUM ITER = 98
*** TIME = .220903E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 34322.300 TIME= 09:50:20
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 09:50:21 OCT 28, 1995 CP= 34322.750
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 43.24 CRITERION= .4835E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.523
HT FLOW CONVERGENCE VALUE= .3893 CRITERION= .2163E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7557E-01
HT FLOW CONVERGENCE VALUE= .7465E-02 CRITERION= .2163E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 38 SUBSTEP 1 COMPLETED. CUM ITER = 100
*** TIME = .252461E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 34783.070 TIME= 10:06:36
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:06:37 OCT 28, 1995 CP= 34783.520
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 41.17 CRITERION= .4638E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.427
HT FLOW CONVERGENCE VALUE= .3749 CRITERION= .2137E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .7348E-01
HT FLOW CONVERGENCE VALUE= .7238E-02 CRITERION= .2137E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 39 SUBSTEP 1 COMPLETED. CUM ITER = 102
*** TIME = .284018E+11 TIME INC = .315576E+10

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 35249.310 TIME= 10:23:00
This load step will be a static (steady-state) step.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:23:00 OCT 28, 1995 CP= 35249.750
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

HT FLOW CONVERGENCE VALUE= 36.79 CRITERION= .4243E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.204
HT FLOW CONVERGENCE VALUE= .3391 CRITERION= .2113E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= .6704E-01
HT FLOW CONVERGENCE VALUE= .6581E-02 CRITERION= .2113E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 1 COMPLETED. CUM ITER = 104
*** TIME = .315576E+11 TIME INC = .315576E+10

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 35706.480

Create element contour plots of solution results

Sort through solution results for time of max temp.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:39:13 OCT 28, 1995 CP= 35706.480
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

VARIABLE 2 IS AT NODE 7655 ITEM= TEMP COMP= NAME= peakgls

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2 NSOL 7655 TEMP peakgls 110.4 31.56 204.3 .1262E+10
*GET TMTMAX FROM VARI 2 ITEM=EXTR TMAX VALUE= .126230403E+10
***** ROUTINE COMPLETED ***** CP = 35706.880

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:39:16 OCT 28, 1995 CP= 35706.930
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW SRP POUR CANISTER WP SIDE CUT AWAY VIEW OF MESH

***** ANSYS RESULTS INTERPRETATION (POST1) *****
Create temperature contour plots of WP at peak

GRAPHIC DISPLAY RESET

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

VIEW POINT FOR WINDOW 1 1.0000 1.0000 1.0000

DISTANCE FOR WINDOW 1 3.000

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER

ELEMENT OUTLINE STYLE FOR WINDOW 1 IS -1 0=DEFAULT, 1=ALTERNATE, -1=NONE
XYZ TRIAD DISPLAY SET TO OFF

MAT NUMBERING KEY = 1

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 31 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 135.00
KABS= 0. TOLERANCE= .000000E+00

18 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

240 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
18 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 1 TO 5 STEP 4

144 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 32 (CYLINDRICAL)

UNSELECT FOR ITEM=LOC COMPONENT=X BETWEEN .30490 AND 100.00
KABS= 0. TOLERANCE= .000000E+00

36 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

UNSELECT FOR ITEM=LOC COMPONENT=Y BETWEEN -45.000 AND 45.000
KABS= 0. TOLERANCE= .000000E+00

27 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ACTIVE COORDINATE SYSTEM SET TO 0 (CARTESIAN)

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

600 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
27 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

202 VOLUMES (OF 404 DEFINED) SELECTED BY VSEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED VOLUMES.

3800 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
202 SELECTED VOLUMES BY ESLV COMMAND.

SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 17 TO 26 STEP 1

10 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

RESELECT FOR ITEM=LOC COMPONENT=X BETWEEN -100.00 AND .000000E+00
KABS= 0. TOLERANCE= .000000E+00

6 AREAS (OF 1290 DEFINED) SELECTED BY ASEL COMMAND.

ALSO SELECT ELEMENTS CREATED FROM SELECTED AREAS.

3992 ELEMENTS (OF 6722 DEFINED) SELECTED FROM
6 SELECTED AREAS BY ESLA COMMAND.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .12623E+10

SET COMMAND GOT LOAD STEP= 25 SUBSTEP= 1 CUMULATIVE ITERATION= 74
TIME/FREQUENCY= .12623E+10

TITLE=
DHLW WP at Time of Peak Temp. (40.000001 years)

/SHOW SWITCH PLOTS TO FILE solupk.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 AUTOMATIC CONTOURS

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solupk.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at Time of Peak Temp. (40.000001 years)

*** WARNING *** CP= 35745.970 TIME= 10:40:12
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 35746.000 TIME= 10:40:12
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.
Create temperature contour plots at 5, 10, 50, and 100 yrs

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .15779E+09

SET COMMAND GOT LOAD STEP= 17 SUBSTEP= 1 CUMULATIVE ITERATION= 50
TIME/FREQUENCY= .15779E+09

TITLE=
DHLW WP at 5 years

/SHOW SWITCH PLOTS TO FILE solu5.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 174.56 BY .24010 TO 205.05

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu5.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 5 years

*** WARNING *** CP= 35793.210 TIME= 10:41:06
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 35793.240 TIME= 10:41:06
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .31558E+09

SET COMMAND GOT LOAD STEP= 22 SUBSTEP= 1 CUMULATIVE ITERATION= 65
TIME/FREQUENCY= .31558E+09

TITLE=
DHLW WP at 10 years

/SHOW SWITCH PLOTS TO FILE solu10.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 174.56 BY .24010 TO 205.05

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu10.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 10 years

*** WARNING *** CP= 35839.270 TIME= 10:41:59
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 35839.300 TIME= 10:41:59
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .78886E-30

SET COMMAND GOT LOAD STEP= 1 SUBSTEP= 1 CUMULATIVE ITERATION= 5
TIME/FREQUENCY= .10000E-05

TITLE=

DHLW WP at 50 years

/SHOW SWITCH PLOTS TO FILE solu50.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 174.56 BY .24010 TO 205.05

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu50.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 50 years

*** WARNING *** CP= 35858.330 TIME= 10:42:20
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 35858.360 TIME= 10:42:20
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= .31558E+10

SET COMMAND GOT LOAD STEP= 31 SUBSTEP= 1 CUMULATIVE ITERATION= 86
TIME/FREQUENCY= .31558E+10

TITLE=
DHLW WP at 100 years

/SHOW SWITCH PLOTS TO FILE solu100.grph - RASTER MODE.
- GRAPHIC PLANES = 8.

WINDOW 1 HAS 128 CONTOURS DEFINED BY PREVIOUS PLOT ACTION
FROM 174.56 BY .24010 TO 205.05

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu100.grph - RASTER MODE.
DISPLAY TITLE=
DHLW WP at 100 years

*** WARNING *** CP= 35904.310 TIME= 10:43:12
The selected element set contains mixed materials.
This could invalidate error estimation.

*** WARNING *** CP= 35904.340 TIME= 10:43:12
The selected element set contains mixed element stiffness types.
This could invalidate error estimation.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 10658 STEP 1

6722 ELEMENTS (OF 6722 DEFINED) SELECTED BY ESEL COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED ***** CP = 35913.170

Print time/temperature output at specific locations
Save profile from center to edge

Variable Legend: A011000

t = structural stainless Canister near center line
c = center of Glass log
h = halfway between center and Canister
s = structural stainless Canister
i = inner barrier of DC
o = outer barrier of DC
= cartesian quadrant number of Canister
i = side of assembly toward center of WP
o = side of assembly toward edge of WP
045 = profile 45 deg down
135 = profile 45 deg up

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:43:22 OCT 28, 1995 CP= 35913.170
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

MAXIMUM NUMBER OF VARIABLES= 32

Temperature Profile from center to lower right (45 deg.) z=2/3

VARIABLE 2 IS AT NODE 7952 ITEM= TEMP COMP= NAME= t94i045
VARIABLE 3 IS AT NODE 7726 ITEM= TEMP COMP= NAME= t94o045
VARIABLE 4 IS AT NODE 7730 ITEM= TEMP COMP= NAME= h94i045
VARIABLE 5 IS AT NODE 7654 ITEM= TEMP COMP= NAME= c94i045
VARIABLE 6 IS AT NODE 7686 ITEM= TEMP COMP= NAME= h94o045
VARIABLE 7 IS AT NODE 7667 ITEM= TEMP COMP= NAME= s94i045
VARIABLE 8 IS AT NODE 7929 ITEM= TEMP COMP= NAME= s94o045
VARIABLE 9 IS AT NODE 8013 ITEM= TEMP COMP= NAME= i94i045
VARIABLE 10 IS AT NODE 8030 ITEM= TEMP COMP= NAME= i94o045
VARIABLE 11 IS AT NODE 8145 ITEM= TEMP COMP= NAME= o94o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	7952 TEMP	t94i045	107.7	31.56	198.9	.1262E+10
3	NSOL	7726 TEMP	t94o045	107.7	31.56	198.9	.1262E+10
4	NSOL	7730 TEMP	h94i045	114.8	31.56	204.5	.1262E+10
5	NSOL	7654 TEMP	c94i045	112.0	31.56	204.1	.1262E+10
6	NSOL	7686 TEMP	h94o045	99.17	31.56	197.7	.1578E+10
7	NSOL	7667 TEMP	s94i045	77.09	31.56	186.8	.1893E+10
8	NSOL	7929 TEMP	s94o045	76.95	31.56	186.8	.1893E+10
9	NSOL	8013 TEMP	i94i045	50.99	.1000E-05	181.9	.1893E+10
10	NSOL	8030 TEMP	i94o045	50.73	.1000E-05	181.8	.1893E+10
11	NSOL	8145 TEMP	o94o045	50.44	.1000E-05	181.7	.1893E+10

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303 VERSION=HP 9000/7XX 10:43:27 OCT 28, 1995 CP= 35915.390
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7952 TEMP t94i045	7726 TEMP t94o045	7730 TEMP h94i045	7654 TEMP c94i045	7686 TEMP h94o045	7667 TEMP s94i045
.10000E-05	107.690	107.737	114.778	111.991	99.1746	77.0887
.20000E-05	107.686	107.733	114.775	111.988	99.1728	77.0874
31.558	107.685	107.732	114.774	111.987	99.1719	77.0865
.31558E+07	119.668	119.716	127.041	124.552	112.030	90.2202
.63116E+07	125.165	125.213	132.662	130.310	117.934	96.2676
.94673E+07	129.010	129.059	136.590	134.335	122.065	100.507
.12623E+08	132.029	132.078	139.671	137.492	125.308	103.843
.15779E+08	134.533	134.582	142.224	140.109	127.999	106.615
.18935E+08	136.680	136.729	144.411	142.350	130.307	108.997
.22090E+08	138.568	138.617	146.334	144.321	132.337	111.096
.25246E+08	140.241	140.290	148.035	146.065	134.137	112.960
.28402E+08	141.750	141.800	149.569	147.637	135.760	114.644
.31558E+08	143.137	143.186	150.977	149.081	137.252	116.194
.63115E+08	152.946	152.995	160.898	159.257	147.816	127.257
.94673E+08	159.188	159.237	167.164	165.687	154.547	134.406
.12623E+09	164.084	164.133	172.050	170.702	159.825	140.066
.15779E+09	168.307	168.356	176.249	175.010	164.375	144.977
.18935E+09	171.834	171.882	179.735	178.587	168.174	149.116
.22090E+09	174.711	174.758	182.558	181.485	171.276	152.539
.25246E+09	177.247	177.294	185.034	184.028	174.011	155.581
.28402E+09	179.078	179.124	186.793	185.837	175.996	157.856
.31558E+09	180.544	180.590	188.181	187.268	177.592	159.729
.63115E+09	190.756	190.797	197.618	197.002	188.708	173.230
.94673E+09	197.144	197.180	203.323	202.879	195.628	182.001
.12623E+10	198.908	198.940	204.478	204.110	197.636	185.440
.15779E+10	198.854	198.883	203.916	203.588	197.716	186.648
.18935E+10	198.069	198.096	202.714	202.409	197.011	186.841
.22090E+10	196.823	196.848	201.129	200.837	195.815	186.360
.25246E+10	195.077	195.100	199.103	198.815	194.090	185.208
.28402E+10	193.495	193.517	197.296	197.012	192.527	184.104
.31558E+10	192.059	192.080	195.677	195.396	191.103	183.053
.63115E+10	184.926	184.943	187.823	187.551	184.020	177.438
.94673E+10	180.074	180.091	182.793	182.504	179.126	172.855
.12623E+11	177.515	177.531	180.144	179.848	176.547	170.434
.15779E+11	175.830	175.846	178.395	178.095	174.853	168.857
.18935E+11	173.932	173.947	176.441	176.135	172.939	167.038
.22090E+11	171.720	171.735	174.177	173.863	170.703	164.882
.25246E+11	169.323	169.338	171.733	171.409	168.279	162.526
.28402E+11	167.016	167.030	169.382	169.049	165.945	160.251
.31558E+11	164.919	164.934	167.247	166.906	163.826	158.185

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:27 OCT 28, 1995 CP= 35915.400
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7929 TEMP s94o045	8013 TEMP 194i045	8030 TEMP 194o045	8145 TEMP o94o045
.10000E-05	76.9510	50.9924	50.7266	50.4438
.20000E-05	76.9498	50.9965	50.7306	50.4477
31.558	76.9489	50.9959	50.7301	50.4472
.31558E+07	90.0857	67.4965	67.2328	66.9503
.63116E+07	96.1348	74.9124	74.6499	74.3679
.94673E+07	100.376	80.0455	79.7838	79.5023

.12623E+08	103.713	84.0553	83.7945	83.5135
.15779E+08	106.486	87.3694	87.1093	86.8288
.18935E+08	108.868	90.2055	89.9460	89.6660
.22090E+08	110.968	92.6963	92.4374	92.1579
.25246E+08	112.832	94.9013	94.6434	94.3643
.28402E+08	114.517	96.8895	96.6327	96.3541
.31558E+08	116.068	98.7163	98.4605	98.1824
.63115E+08	127.136	111.668	111.420	111.152
.94673E+08	134.288	119.972	119.731	119.471
.12623E+09	139.951	126.515	126.280	126.027
.15779E+09	144.864	132.162	131.933	131.686
.18935E+09	149.006	136.912	136.688	136.447
.22090E+09	152.431	140.842	140.623	140.387
.25246E+09	155.475	144.332	144.118	143.886
.28402E+09	157.752	146.969	146.758	146.531
.31558E+09	159.626	149.155	148.948	148.725
.63115E+09	173.143	164.921	164.745	164.556
.94673E+09	181.924	175.122	174.968	174.803
.12623E+10	185.372	179.434	179.297	179.151
.15779E+10	186.587	181.251	181.127	180.994
.18935E+10	186.784	181.894	181.781	181.659
.22090E+10	186.307	181.753	181.647	181.534
.25246E+10	185.158	180.851	180.751	180.645
.28402E+10	184.057	179.947	179.853	179.752
.31558E+10	183.008	179.055	178.965	178.868
.63115E+10	177.400	174.057	173.983	173.903
.94673E+10	172.819	169.538	169.467	169.391
.12623E+11	170.399	167.149	167.080	167.006
.15779E+11	168.823	165.603	165.535	165.462
.18935E+11	167.004	163.797	163.730	163.658
.22090E+11	164.848	161.638	161.572	161.501
.25246E+11	162.493	159.269	159.204	159.133
.28402E+11	160.218	156.979	156.914	156.844
.31558E+11	158.153	154.899	154.834	154.765

 * Temperature Profile from center to lower right (45 deg.) *

VARIABLE 2 IS AT NODE 7947 ITEM= TEMP COMP= NAME= t04i045

*** WARNING *** CP= 35915.610 TIME= 10:43:27
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 7718 ITEM= TEMP COMP= NAME= t04o045

VARIABLE 4 IS AT NODE 7720 ITEM= TEMP COMP= NAME= h04i045

VARIABLE 5 IS AT NODE 7642 ITEM= TEMP COMP= NAME= c04i045

VARIABLE 6 IS AT NODE 7679 ITEM= TEMP COMP= NAME= h04o045

VARIABLE 7 IS AT NODE 7662 ITEM= TEMP COMP= NAME= s04i045

VARIABLE 8 IS AT NODE 7927 ITEM= TEMP COMP= NAME= s04o045

VARIABLE 9 IS AT NODE 8008 ITEM= TEMP COMP= NAME= i04i045

VARIABLE 10 IS AT NODE 8027 ITEM= TEMP COMP= NAME= i04o045

VARIABLE 11 IS AT NODE 8142 ITEM= TEMP COMP= NAME= o04o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
 VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2 NSOL	7947 TEMP	t04i045	106.7	31.56	198.7	.1262E+10
3 NSOL	7718 TEMP	t04o045	106.7	31.56	198.8	.1262E+10
4 NSOL	7720 TEMP	h04i045	113.8	31.56	204.5	.1262E+10

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5 NSOL 7642 TEMP      c04i045  110.8  31.56  204.0  .1262E+10
6 NSOL 7679 TEMP      h04o045  98.08  31.56  197.6  .1578E+10
7 NSOL 7662 TEMP      s04i045  75.80  31.56  186.6  .1893E+10
8 NSOL 7927 TEMP      s04o045  75.67  31.56  186.6  .1893E+10
9 NSOL 8008 TEMP      i04i045  50.10  .1000E-05  181.8  .1893E+10
10 NSOL 8027 TEMP      i04o045  49.82  .1000E-05  181.7  .1893E+10
11 NSOL 8142 TEMP      o04o045  49.55  .1000E-05  181.6  .1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303      VERSION=HP 9000/7XX  10:43:29 OCT 28, 1995 CP= 35917.550
FOR SUPPORT CALL ROBERT BAHNEY  PHONE (702) 794-5337  FAX (702) 794-1844

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DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7947 TEMP t04i045	7718 TEMP t04o045	7720 TEMP h04i045	7642 TEMP c04i045	7679 TEMP h04o045	7662 TEMP s04i045
.10000E-05	106.671	106.721	113.830	110.809	98.0792	75.8049
.20000E-05	106.667	106.717	113.827	110.806	98.0776	75.8038
31.558	106.666	106.716	113.826	110.805	98.0768	75.8030
.31558E+07	118.821	118.872	126.293	123.582	111.140	89.1349
.63116E+07	124.386	124.438	131.994	129.427	117.128	95.2626
.94673E+07	128.276	128.328	135.974	133.508	121.312	99.5540
.12623E+08	131.328	131.380	139.094	136.707	124.596	102.928
.15779E+08	133.858	133.911	141.678	139.357	127.319	105.731
.18935E+08	136.026	136.079	143.890	141.626	129.654	108.139
.22090E+08	137.934	137.986	145.834	143.621	131.707	110.260
.25246E+08	139.622	139.675	147.555	145.385	133.526	112.143
.28402E+08	141.146	141.199	149.105	146.976	135.167	113.844
.31558E+08	142.545	142.598	150.528	148.436	136.675	115.410
.63115E+08	152.439	152.492	160.550	158.724	147.345	126.575
.94673E+08	158.731	158.784	166.872	165.218	154.135	133.783
.12623E+09	163.664	163.717	171.800	170.281	159.458	139.488
.15779E+09	167.917	167.969	176.032	174.627	164.044	144.435
.18935E+09	171.468	171.520	179.545	178.235	167.872	148.605
.22090E+09	174.364	174.415	182.389	181.159	170.997	152.052
.25246E+09	176.917	176.968	184.882	183.722	173.752	155.116
.28402E+09	178.761	178.811	186.654	185.548	175.752	157.407
.31558E+09	180.238	180.287	188.052	186.992	177.360	159.295
.63115E+09	190.525	190.569	197.555	196.816	188.557	172.898
.94673E+09	196.957	196.997	203.291	202.742	195.520	181.730
.12623E+10	198.745	198.780	204.457	203.995	197.547	185.205
.15779E+10	198.707	198.739	203.899	203.486	197.638	186.438
.18935E+10	197.934	197.963	202.698	202.316	196.940	186.648
.22090E+10	196.696	196.724	201.112	200.749	195.748	186.180
.25246E+10	194.955	194.981	199.085	198.730	194.025	185.037
.28402E+10	193.378	193.403	197.277	196.930	192.463	183.941
.31558E+10	191.945	191.968	195.657	195.315	191.041	182.895
.63115E+10	184.826	184.845	187.798	187.477	183.962	177.303
.94673E+10	179.974	179.992	182.762	182.426	179.064	172.721
.12623E+11	177.415	177.432	180.111	179.768	176.483	170.301
.15779E+11	175.730	175.747	178.359	178.014	174.788	168.725
.18935E+11	173.831	173.848	176.403	176.053	172.873	166.906
.22090E+11	171.618	171.634	174.137	173.779	170.635	164.749
.25246E+11	169.220	169.235	171.690	171.322	168.209	162.391
.28402E+11	166.910	166.926	169.336	168.959	165.872	160.116
.31558E+11	164.813	164.828	167.198	166.813	163.750	158.049

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
38303      VERSION=HP 9000/7XX  10:43:29 OCT 28, 1995 CP= 35917.560
FOR SUPPORT CALL ROBERT BAHNEY  PHONE (702) 794-5337  FAX (702) 794-1844

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DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7927 TEMP s04o045	8008 TEMP i04i045	8027 TEMP i04o045	8142 TEMP o04o045
.10000E-05	75.6703	50.0951	49.8237	49.5471
.20000E-05	75.6692	50.0990	49.8275	49.5508
31.558	75.6683	50.0985	49.8270	49.5504
.31558E+07	89.0033	66.7949	66.5259	66.2490
.63116E+07	95.1325	74.2846	74.0170	73.7404
.94673E+07	99.4251	79.4639	79.1973	78.9210
.12623E+08	102.801	83.5076	83.2419	82.9660
.15779E+08	105.605	86.8483	86.5834	86.3078
.18935E+08	108.013	89.7061	89.4420	89.1668
.22090E+08	110.135	92.2154	91.9519	91.6771
.25246E+08	112.018	94.4363	94.1737	93.8993
.28402E+08	113.720	96.4383	96.1769	95.9029
.31558E+08	115.286	98.2775	98.0172	97.7436
.63115E+08	126.456	111.306	111.055	110.790
.94673E+08	133.667	119.653	119.408	119.151
.12623E+09	139.375	126.226	125.987	125.737
.15779E+09	144.325	131.896	131.664	131.420
.18935E+09	148.497	136.666	136.438	136.200
.22090E+09	151.946	140.612	140.389	140.156
.25246E+09	155.012	144.115	143.897	143.668
.28402E+09	157.305	146.761	146.547	146.323
.31558E+09	159.194	148.956	148.746	148.526
.63115E+09	172.812	164.778	164.600	164.413
.94673E+09	181.655	175.010	174.855	174.692
.12623E+10	185.138	179.339	179.201	179.055
.15779E+10	186.377	181.167	181.041	180.910
.18935E+10	186.592	181.818	181.703	181.582
.22090E+10	186.128	181.682	181.575	181.463
.25246E+10	184.988	180.783	180.683	180.577
.28402E+10	183.894	179.882	179.787	179.687
.31558E+10	182.851	178.993	178.901	178.805
.63115E+10	177.266	174.003	173.928	173.849
.94673E+10	172.686	169.484	169.412	169.337
.12623E+11	170.267	167.095	167.025	166.951
.15779E+11	168.691	165.549	165.480	165.408
.18935E+11	166.873	163.743	163.675	163.603
.22090E+11	164.716	161.583	161.516	161.446
.25246E+11	162.359	159.213	159.147	159.077
.28402E+11	160.084	156.922	156.856	156.787
.31558E+11	158.017	154.841	154.776	154.707

 * Temperature Profile from center to upper right (135 deg.) *

VARIABLE 2 IS AT NODE 63 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 35917.770 TIME= 10:43:29
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 20 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 22 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 1 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 11 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 6 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 58 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 84 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 106 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 124 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	63 TEMP	t01i135	106.7	31.56	198.7	.1262E+10
3 NSOL	20 TEMP	t01o135	106.7	31.56	198.8	.1262E+10
4 NSOL	22 TEMP	h01i135	113.8	31.56	204.5	.1262E+10
5 NSOL	1 TEMP	c01i135	110.8	31.56	204.0	.1262E+10
6 NSOL	11 TEMP	h01o135	98.04	31.56	197.6	.1578E+10
7 NSOL	6 TEMP	s01i135	75.76	31.56	186.6	.1893E+10
8 NSOL	58 TEMP	s01o135	75.62	31.56	186.6	.1893E+10
9 NSOL	84 TEMP	i01i135	50.03	.1000E-05	181.8	.1893E+10
10 NSOL	106 TEMP	i01o135	49.75	.1000E-05	181.7	.1893E+10
11 NSOL	124 TEMP	o01o135	49.48	.1000E-05	181.6	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:31 OCT 28, 1995 CP= 35919.700
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	63 TEMP t01i135	20 TEMP t01o135	22 TEMP h01i135	1 TEMP c01i135	11 TEMP h01o135	6 TEMP s01i135
.10000E-05	106.664	106.714	113.812	110.781	98.0428	75.7596
.20000E-05	106.660	106.710	113.810	110.779	98.0413	75.7585
31.558	106.659	106.710	113.809	110.778	98.0404	75.7576
.31558E+07	118.815	118.866	126.276	123.556	111.106	89.0917
.63116E+07	124.381	124.433	131.978	129.403	117.094	95.2205
.94673E+07	128.271	128.323	135.959	133.484	121.279	99.5126
.12623E+08	131.323	131.375	139.079	136.683	124.564	102.888
.15779E+08	133.853	133.906	141.663	139.333	127.287	105.691
.18935E+08	136.022	136.074	143.876	141.603	129.622	108.099
.22090E+08	137.929	137.982	145.820	143.598	131.676	110.221
.25246E+08	139.618	139.671	147.540	145.363	133.495	112.104
.28402E+08	141.141	141.194	149.091	146.954	135.136	113.806
.31558E+08	142.541	142.594	150.514	148.414	136.644	115.372
.63115E+08	152.435	152.489	160.537	158.703	147.316	126.539
.94673E+08	158.728	158.781	166.860	165.198	154.108	133.749
.12623E+09	163.661	163.713	171.789	170.262	159.432	139.456
.15779E+09	167.914	167.966	176.021	174.608	164.019	144.404
.18935E+09	171.465	171.517	179.534	178.218	167.848	148.574
.22090E+09	174.361	174.413	182.378	181.141	170.974	152.022
.25246E+09	176.914	176.965	184.872	183.706	173.729	155.087
.28402E+09	178.758	178.809	186.644	185.532	175.730	157.380
.31558E+09	180.235	180.285	188.043	186.977	177.338	159.267
.63115E+09	190.523	190.567	197.547	196.803	188.539	172.876
.94673E+09	196.956	196.995	203.285	202.731	195.505	181.711
.12623E+10	198.744	198.779	204.451	203.986	197.534	185.189
.15779E+10	198.706	198.738	203.893	203.477	197.626	186.423
.18935E+10	197.932	197.962	202.693	202.308	196.929	186.634
.22090E+10	196.695	196.723	201.108	200.741	195.737	186.167
.25246E+10	194.954	194.980	199.081	198.723	194.016	185.024
.28402E+10	193.377	193.402	197.273	196.923	192.454	183.929
.31558E+10	191.944	191.967	195.653	195.308	191.032	182.884
.63115E+10	184.825	184.844	187.795	187.471	183.954	177.294
.94673E+10	179.974	179.991	182.759	182.421	179.057	172.712
.12623E+11	177.414	177.431	180.107	179.763	176.476	170.292
.15779E+11	175.729	175.746	178.356	178.009	174.781	168.716

.18935E+11	173.831	173.847	176.400	176.048	172.866	166.897
.22090E+11	171.617	171.633	174.134	173.773	170.628	164.740
.25246E+11	169.219	169.235	171.686	171.317	168.202	162.383
.28402E+11	166.909	166.925	169.332	168.954	165.865	160.107
.31558E+11	164.812	164.827	167.195	166.808	163.743	158.040

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:31 OCT 28, 1995 CP= 35919.710
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	58 TEMP	84 TEMP	106 TEMP	124 TEMP
	s01o135	i01i135	i01o135	o01o135
.10000E-05	75.6248	50.0260	49.7544	49.4769
.20000E-05	75.6237	50.0299	49.7582	49.4806
31.558	75.6229	50.0294	49.7577	49.4802
.31558E+07	88.9600	66.7327	66.4635	66.1858
.63116E+07	95.0903	74.2253	73.9575	73.6800
.94673E+07	99.3837	79.4065	79.1397	78.8626
.12623E+08	102.760	83.4518	83.1859	82.9091
.15779E+08	105.564	86.7936	86.5285	86.2521
.18935E+08	107.973	89.6525	89.3882	89.1121
.22090E+08	110.096	92.1626	91.8990	91.6234
.25246E+08	111.979	94.3844	94.1216	93.8464
.28402E+08	113.681	96.3871	96.1255	95.8507
.31558E+08	115.248	98.2269	97.9664	97.6920
.63115E+08	126.420	111.260	111.008	110.743
.94673E+08	133.633	119.610	119.365	119.107
.12623E+09	139.343	126.185	125.947	125.696
.15779E+09	144.293	131.858	131.625	131.381
.18935E+09	148.466	136.629	136.401	136.162
.22090E+09	151.917	140.576	140.353	140.120
.25246E+09	154.983	144.080	143.863	143.633
.28402E+09	157.277	146.728	146.514	146.289
.31558E+09	159.167	148.923	148.713	148.492
.63115E+09	172.789	164.753	164.574	164.386
.94673E+09	181.636	174.989	174.833	174.670
.12623E+10	185.121	179.320	179.182	179.036
.15779E+10	186.362	181.150	181.024	180.892
.18935E+10	186.578	181.802	181.687	181.566
.22090E+10	186.115	181.667	181.560	181.448
.25246E+10	184.976	180.770	180.669	180.563
.28402E+10	183.883	179.869	179.774	179.673
.31558E+10	182.840	178.980	178.889	178.793
.63115E+10	177.257	173.992	173.917	173.839
.94673E+10	172.677	169.473	169.402	169.326
.12623E+11	170.258	167.085	167.015	166.941
.15779E+11	168.683	165.539	165.470	165.398
.18935E+11	166.864	163.733	163.665	163.593
.22090E+11	164.708	161.573	161.506	161.436
.25246E+11	162.351	159.204	159.137	159.067
.28402E+11	160.075	156.912	156.846	156.777
.31558E+11	158.008	154.832	154.766	154.697

 * Temp. Prof. from center to lower right (45 deg.) z=glass bot *

VARIABLE 2 IS AT NODE 7951 ITEM= TEMP COMP= NAME= tb4i045

*** WARNING *** CP= 35919.920 TIME= 10:43:31
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 7722 ITEM= TEMP COMP= NAME= tb4o045
 VARIABLE 4 IS AT NODE 7724 ITEM= TEMP COMP= NAME= hb4i045
 VARIABLE 5 IS AT NODE 7650 ITEM= TEMP COMP= NAME= cb4i045
 VARIABLE 6 IS AT NODE 7682 ITEM= TEMP COMP= NAME= hb4o045
 VARIABLE 7 IS AT NODE 7666 ITEM= TEMP COMP= NAME= sb4i045
 VARIABLE 8 IS AT NODE 7928 ITEM= TEMP COMP= NAME= sb4o045
 VARIABLE 9 IS AT NODE 8012 ITEM= TEMP COMP= NAME= ib4i045
 VARIABLE 10 IS AT NODE 8029 ITEM= TEMP COMP= NAME= ib4o045
 VARIABLE 11 IS AT NODE 8144 ITEM= TEMP COMP= NAME= ob4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	7951 TEMP	tb4i045	85.15	31.56	191.2	.1578E+10
3	NSOL	7722 TEMP	tb4o045	85.09	31.56	191.2	.1578E+10
4	NSOL	7724 TEMP	hb4i045	80.26	31.56	188.8	.1893E+10
5	NSOL	7650 TEMP	cb4i045	76.40	31.56	187.5	.1893E+10
6	NSOL	7682 TEMP	hb4o045	71.83	31.56	186.1	.1893E+10
7	NSOL	7666 TEMP	sb4i045	66.59	31.56	184.3	.1893E+10
8	NSOL	7928 TEMP	sb4o045	66.53	31.56	184.2	.1893E+10
9	NSOL	8012 TEMP	ib4i045	47.83	.1000E-05	181.1	.1893E+10
10	NSOL	8029 TEMP	ib4o045	47.62	.1000E-05	181.0	.1893E+10
11	NSOL	8144 TEMP	ob4o045	47.39	.1000E-05	180.9	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7(X) 10:43:33 OCT 28, 1995 CP= 35921.850
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7951 TEMP tb4i045	7722 TEMP tb4o045	7724 TEMP hb4i045	7650 TEMP cb4i045	7682 TEMP hb4o045	7666 TEMP sb4i045
.10000E-05	85.1537	85.0939	80.2649	76.4032	71.8313	66.5862
.20000E-05	85.1536	85.0938	80.2647	76.4030	71.8314	66.5866
31.558	85.1525	85.0927	80.2637	76.4021	71.8305	66.5858
.31558E+07	98.5261	98.4655	93.6759	89.9779	85.6325	80.6200
.63116E+07	104.647	104.586	99.8257	96.2085	91.9684	87.0632
.94673E+07	108.926	108.865	104.127	100.566	96.4019	91.5721
.12623E+08	112.285	112.224	107.506	103.990	99.8855	95.1178
.15779E+08	115.072	115.010	110.311	106.833	102.778	98.0621
.18935E+08	117.462	117.400	112.718	109.273	105.261	100.591
.22090E+08	119.565	119.504	114.837	111.422	107.449	102.819
.25246E+08	121.429	121.368	116.716	113.328	109.389	104.796
.28402E+08	123.112	123.050	118.413	115.050	111.143	106.583
.31558E+08	124.659	124.597	119.974	116.634	112.756	108.227
.63115E+08	135.629	135.569	131.067	127.908	124.256	119.964
.94673E+08	142.659	142.599	138.199	135.168	131.674	127.550
.12623E+09	148.193	148.134	143.827	140.903	137.539	133.555
.15779E+09	152.977	152.918	148.698	145.868	142.620	138.760
.18935E+09	156.991	156.934	152.792	150.046	146.899	143.149
.22090E+09	160.292	160.235	156.169	153.496	150.436	146.784
.25246E+09	163.214	163.157	159.164	156.558	153.579	150.015
.28402E+09	165.372	165.317	161.390	158.843	155.933	152.446
.31558E+09	167.132	167.078	163.215	160.721	157.873	154.456

.63115E+09	179.641	179.593	176.273	174.202	171.842	168.986
.94673E+09	187.627	187.584	184.683	182.909	180.893	178.436
.12623E+10	190.466	190.428	187.839	186.269	184.486	182.308
.15779E+10	191.205	191.170	188.824	187.405	185.794	183.826
.18935E+10	191.026	190.994	188.840	187.537	186.057	184.251
.22090E+10	190.250	190.220	188.218	187.005	185.628	183.947
.25246E+10	188.862	188.835	186.953	185.809	184.510	182.927
.28402E+10	187.570	187.544	185.759	184.670	183.434	181.929
.31558E+10	186.366	186.341	184.634	183.590	182.405	180.963
.63115E+10	180.148	180.128	178.729	177.860	176.873	175.678
.94673E+10	175.437	175.418	174.082	173.243	172.289	171.138
.12623E+11	172.950	172.932	171.629	170.805	169.867	168.738
.15779E+11	171.325	171.306	170.028	169.216	168.292	167.180
.18935E+11	169.466	169.447	168.189	167.385	166.470	165.372
.22090E+11	167.275	167.258	166.015	165.217	164.308	163.219
.25246E+11	164.890	164.872	163.643	162.849	161.944	160.861
.28402E+11	162.589	162.571	161.354	160.564	159.661	158.583
.31558E+11	160.499	160.482	159.276	158.488	157.588	156.515

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=WP 9000/7XX 10:43:33 OCT 28, 1995 CP= 35921.860
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7928 TEMP	8012 TEMP	8029 TEMP	8144 TEMP
	sb4o045	ib4i045	ib4o045	ob4o045
.10000E-05	66.5287	47.8335	47.6160	47.3897
.20000E-05	66.5291	47.8374	47.6198	47.3935
31.558	66.5283	47.8369	47.6194	47.3930
.31558E+07	80.5654	64.5343	64.3181	64.0941
.63116E+07	87.0099	72.0444	71.8291	71.6064
.94673E+07	91.5197	77.2434	77.0287	76.8069
.12623E+08	95.0662	81.3058	81.0917	80.8707
.15779E+08	98.0112	84.6639	84.4502	84.2300
.18935E+08	100.541	87.5380	87.3248	87.1053
.22090E+08	102.769	90.0625	89.8498	89.6309
.25246E+08	104.746	92.2980	92.0857	91.8674
.28402E+08	106.533	94.3139	94.1024	93.8847
.31558E+08	108.178	96.1665	95.9558	95.7386
.63115E+08	119.919	109.319	109.116	108.907
.94673E+08	127.506	117.760	117.561	117.359
.12623E+09	133.513	124.410	124.217	124.020
.15779E+09	138.719	130.150	129.961	129.770
.18935E+09	143.110	134.979	134.794	134.608
.22090E+09	146.745	138.977	138.796	138.614
.25246E+09	149.977	142.527	142.350	142.172
.28402E+09	152.409	145.213	145.040	144.865
.31558E+09	154.420	147.444	147.274	147.102
.63115E+09	168.955	163.544	163.400	163.255
.94673E+09	178.410	173.965	173.839	173.714
.12623E+10	182.285	178.420	178.307	178.195
.15779E+10	183.805	180.338	180.236	180.135
.18935E+10	184.231	181.058	180.965	180.872
.22090E+10	183.929	180.976	180.889	180.802
.25246E+10	182.910	180.117	180.036	179.955
.28402E+10	181.913	179.249	179.171	179.094
.31558E+10	180.947	178.385	178.311	178.237
.63115E+10	175.666	173.497	173.436	173.375
.94673E+10	171.125	168.993	168.935	168.877
.12623E+11	168.726	166.612	166.556	166.499
.15779E+11	167.169	165.073	165.017	164.961
.18935E+11	165.360	163.271	163.216	163.161
.22090E+11	163.207	161.114	161.060	161.005
.25246E+11	160.850	158.746	158.692	158.638

.28402E+11	158.572	156.455	156.402	156.348
.31558E+11	156.504	154.375	154.322	154.269

 * Temp. Prof. from center to upper right (135 deg.) z=glass bot*

VARIABLE 2 IS AT NODE 1033 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 35922.070 TIME= 10:43:33
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 733 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 735 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 679 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 704 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 691 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 1018 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 1292 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 1307 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 2078 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2 NSOL	1033 TEMP	t01i135	85.14	31.56	191.2	.1578E+10
3 NSOL	733 TEMP	t01o135	85.08	31.56	191.2	.1578E+10
4 NSOL	735 TEMP	h01i135	80.24	31.56	188.8	.1893E+10
5 NSOL	679 TEMP	c01i135	76.37	31.56	187.5	.1893E+10
6 NSOL	704 TEMP	h01o135	71.79	31.56	186.0	.1893E+10
7 NSOL	691 TEMP	s01i135	66.54	31.56	184.2	.1893E+10
8 NSOL	1018 TEMP	s01o135	66.48	31.56	184.2	.1893E+10
9 NSOL	1292 TEMP	i01i135	47.77	.1000E-05	181.0	.1893E+10
10 NSOL	1307 TEMP	i01o135	47.55	.1000E-05	181.0	.1893E+10
11 NSOL	2078 TEMP	o01o135	47.32	.1000E-05	180.9	.1893E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:35 OCT 28, 1995 CP= 35924.000
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1033 TEMP t01i135	733 TEMP t01o135	735 TEMP h01i135	679 TEMP c01i135	704 TEMP h01o135	691 TEMP s01i135
.10000E-05	85.1425	85.0825	80.2442	76.3742	71.7947	66.5424
.20000E-05	85.1424	85.0824	80.2439	76.3740	71.7948	66.5428
31.558	85.1413	85.0814	80.2429	76.3731	71.7940	66.5420
.31558E+07	98.5161	98.4553	93.6564	89.9506	85.5980	80.5785
.63116E+07	104.637	104.576	99.8068	96.1819	91.9349	87.0228
.94673E+07	108.917	108.855	104.109	100.540	96.3691	91.5325
.12623E+08	112.276	112.215	107.488	103.965	99.8532	95.0789
.15779E+08	115.063	115.001	110.293	106.808	102.746	98.0238
.18935E+08	117.453	117.392	112.700	109.248	105.230	100.553

.22090E+08	119.556	119.495	114.820	111.397	107.418	102.781
.25246E+08	121.421	121.359	116.699	113.304	109.359	104.759
.28402E+08	123.103	123.042	118.396	115.026	111.112	106.546
.31558E+08	124.650	124.589	119.957	116.610	112.726	108.191
.63115E+08	135.622	135.561	131.051	127.885	124.228	119.931
.94673E+08	142.652	142.592	138.184	135.146	131.647	127.518
.12623E+09	148.187	148.128	143.813	140.882	137.514	133.524
.15779E+09	152.971	152.912	148.684	145.848	142.595	138.731
.18935E+09	156.986	156.928	152.779	150.027	146.875	143.121
.22090E+09	160.286	160.229	156.156	153.478	150.413	146.757
.25246E+09	163.209	163.152	159.151	156.541	153.557	149.989
.28402E+09	165.367	165.312	161.378	158.826	155.911	152.420
.31558E+09	167.128	167.073	163.203	160.704	157.852	154.431
.63115E+09	179.637	179.589	176.264	174.188	171.826	168.965
.94673E+09	187.624	187.581	184.674	182.897	180.879	178.418
.12623E+10	190.463	190.425	187.832	186.259	184.473	182.293
.15779E+10	191.202	191.167	188.818	187.396	185.783	183.812
.18935E+10	191.023	190.992	188.834	187.528	186.047	184.238
.22090E+10	190.248	190.218	188.212	186.997	185.618	183.935
.25246E+10	188.860	188.832	186.947	185.801	184.501	182.915
.28402E+10	187.568	187.542	185.754	184.663	183.426	181.919
.31558E+10	186.364	186.339	184.629	183.583	182.397	180.952
.63115E+10	180.146	180.126	178.725	177.855	176.866	175.670
.94673E+10	175.435	175.416	174.078	173.238	172.282	171.129
.12623E+11	172.949	172.930	171.625	170.799	169.860	168.730
.15779E+11	171.323	171.305	170.024	169.211	168.285	167.172
.18935E+11	169.464	169.446	168.185	167.380	166.464	165.364
.22090E+11	167.274	167.256	166.011	165.212	164.302	163.211
.25246E+11	164.888	164.871	163.639	162.844	161.937	160.853
.28402E+11	162.587	162.570	161.351	160.558	159.654	158.575
.31558E+11	160.497	160.480	159.272	158.483	157.581	156.507

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:35 OCT 28, 1995 CP= 35924.010
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1018 TEMP	1292 TEMP	1307 TEMP	2078 TEMP
	s01o135	101i135	101o135	o01o135
.10000E-05	66.4849	47.7689	47.5512	47.3247
.20000E-05	66.4853	47.7727	47.5550	47.3285
31.558	66.4845	47.7723	47.5546	47.3280
.31558E+07	80.5238	64.4758	64.2595	64.0353
.63116E+07	86.9695	71.9886	71.7732	71.5503
.94673E+07	91.4800	77.1893	76.9745	76.7526
.12623E+08	95.0272	81.2531	81.0389	80.8178
.15779E+08	97.9727	84.6122	84.3985	84.1782
.18935E+08	100.503	87.4873	87.2741	87.0544
.22090E+08	102.731	90.0126	89.7999	89.5809
.25246E+08	104.709	92.2488	92.0365	91.8181
.28402E+08	106.497	94.2654	94.0539	93.8360
.31558E+08	108.142	96.1186	95.9078	95.6905
.63115E+08	119.885	109.276	109.072	108.863
.94673E+08	127.474	117.719	117.520	117.318
.12623E+09	133.482	124.372	124.178	123.982
.15779E+09	138.689	130.113	129.924	129.733
.18935E+09	143.081	134.944	134.759	134.573
.22090E+09	146.718	138.943	138.762	138.580
.25246E+09	149.951	142.495	142.318	142.139
.28402E+09	152.383	145.182	145.008	144.834
.31558E+09	154.394	147.413	147.243	147.072
.63115E+09	168.935	163.520	163.375	163.230
.94673E+09	178.392	173.945	173.819	173.693
.12623E+10	182.270	178.402	178.289	178.178

.15779E+10	183.791	180.322	180.220	180.119
.18935E+10	184.219	181.044	180.950	180.857
.22090E+10	183.917	180.962	180.875	180.789
.25246E+10	182.899	180.104	180.023	179.942
.28402E+10	181.903	179.237	179.159	179.082
.31558E+10	180.937	178.373	178.299	178.226
.63115E+10	175.657	173.487	173.426	173.365
.94673E+10	171.117	168.983	168.925	168.867
.12623E+11	168.718	166.603	166.546	166.489
.15779E+11	167.161	165.064	165.008	164.952
.18935E+11	165.352	163.262	163.206	163.151
.22090E+11	163.199	161.105	161.050	160.996
.25246E+11	160.842	158.736	158.682	158.628
.28402E+11	158.564	156.446	156.392	156.339
.31558E+11	156.496	154.366	154.313	154.259

 * Temp. Prof. from center to lower right (45 deg.) z=glass top *

VARIABLE 2 IS AT NODE 8470 ITEM= TEMP COMP= NAME= tt4i045

*** WARNING *** CP= 35924.220 TIME= 10:43:36
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 8270 ITEM= TEMP COMP= NAME= tt4o045

VARIABLE 4 IS AT NODE 8272 ITEM= TEMP COMP= NAME= ht4i045

VARIABLE 5 IS AT NODE 8234 ITEM= TEMP COMP= NAME= ct4i045

VARIABLE 6 IS AT NODE 8251 ITEM= TEMP COMP= NAME= ht4o045

VARIABLE 7 IS AT NODE 8242 ITEM= TEMP COMP= NAME= st4i045

VARIABLE 8 IS AT NODE 8460 ITEM= TEMP COMP= NAME= st4o045

VARIABLE 9 IS AT NODE 8556 ITEM= TEMP COMP= NAME= it4i045

VARIABLE 10 IS AT NODE 8566 ITEM= TEMP COMP= NAME= it4o045

VARIABLE 11 IS AT NODE 8691 ITEM= TEMP COMP= NAME= ot4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	8470 TEMP	tt4i045	86.17	31.56	192.0	.1578E+10
3	NSOL	8270 TEMP	tt4o045	86.21	31.56	192.0	.1578E+10
4	NSOL	8272 TEMP	ht4i045	99.24	31.56	199.5	.1262E+10
5	NSOL	8234 TEMP	ct4i045	98.61	31.56	200.2	.1262E+10
6	NSOL	8251 TEMP	ht4o045	85.57	31.56	194.5	.1578E+10
7	NSOL	8242 TEMP	st4i045	59.79	.1000E-05	183.2	.1893E+10
8	NSOL	8460 TEMP	st4o045	59.70	.1000E-05	183.1	.1893E+10
9	NSOL	8556 TEMP	it4i045	43.21	.1000E-05	180.4	.1893E+10
10	NSOL	8566 TEMP	it4o045	43.04	.1000E-05	180.3	.1893E+10
11	NSOL	8691 TEMP	ot4o045	42.86	.1000E-05	180.3	.1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:37 OCT 28, 1995 CP= 35926.150
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8470 TEMP tt4i045	8270 TEMP tt4o045	8272 TEMP ht4i045	8234 TEMP ct4i045	8251 TEMP ht4o045	8242 TEMP st4i045
.10000E-05	86.1725	86.2088	99.2425	98.6161	85.5731	59.7872
.20000E-05	86.1718	86.2081	99.2417	98.6156	85.5730	59.7878
31.558	86.1709	86.2073	99.2409	98.6148	85.5723	59.7872
.31558E+07	99.8167	99.8533	112.869	112.484	99.8767	74.8147
.63116E+07	106.028	106.065	119.073	118.799	106.394	81.6628
.94673E+07	110.355	110.391	123.391	123.194	110.932	86.4329
.12623E+08	113.744	113.781	126.772	126.635	114.487	90.1747
.15779E+08	116.552	116.588	129.569	129.483	117.431	93.2766
.18935E+08	118.957	118.993	131.963	131.919	119.953	95.9370
.22090E+08	121.071	121.107	134.066	134.060	122.169	98.2777
.25246E+08	122.943	122.979	135.926	135.953	124.131	100.353
.28402E+08	124.632	124.668	137.603	137.659	125.900	102.226
.31558E+08	126.184	126.220	139.142	139.226	127.525	103.949
.63115E+08	137.174	137.210	149.993	150.265	139.021	116.218
.94673E+08	144.191	144.226	156.857	157.242	146.335	124.119
.12623E+09	149.705	149.740	162.216	162.685	152.066	130.362
.15779E+09	154.463	154.498	166.819	167.356	156.998	135.763
.18935E+09	158.452	158.485	170.651	171.241	161.118	140.314
.22090E+09	161.726	161.760	173.769	174.400	164.490	144.081
.25246E+09	164.623	164.656	176.511	177.175	167.465	147.429
.28402E+09	166.758	166.790	178.491	179.176	169.645	149.952
.31558E+09	168.496	168.528	180.075	180.775	171.412	152.042
.63115E+09	180.808	180.837	191.002	191.768	183.786	167.134
.94673E+09	188.641	188.666	197.710	198.475	191.520	176.927
.12623E+10	191.368	191.391	199.518	200.234	194.035	181.000
.15779E+10	192.023	192.044	199.429	200.089	194.472	182.653
.18935E+10	191.780	191.799	198.586	199.193	194.034	183.178
.22090E+10	190.954	190.971	197.277	197.837	193.040	182.948
.25246E+10	189.527	189.544	195.460	195.978	191.465	181.981
.28402E+10	188.203	188.219	193.821	194.305	190.022	181.027
.31558E+10	186.974	186.989	192.336	192.792	188.694	180.094
.63115E+10	180.656	180.668	185.010	185.354	181.984	174.940
.94673E+10	175.926	175.938	180.052	180.358	177.132	170.409
.12623E+11	173.430	173.441	177.440	177.728	174.575	168.014
.15779E+11	171.797	171.808	175.722	175.998	172.900	166.462
.18935E+11	169.932	169.943	173.787	174.050	170.996	164.654
.22090E+11	167.738	167.748	171.532	171.782	168.761	162.499
.25246E+11	165.349	165.359	169.088	169.325	166.332	160.136
.28402E+11	163.045	163.055	166.735	166.960	163.991	157.852
.31558E+11	160.952	160.962	164.599	164.813	161.865	155.779

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:37 OCT 28, 1995 CP= 35926.160
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8460 TEMP st4o045	8556 TEMP it4i045	8566 TEMP it4o045	8691 TEMP ot4o045
.10000E-05	59.6986	43.2071	43.0400	42.8615
.20000E-05	59.6991	43.2099	43.0428	42.8643
31.558	59.6986	43.2096	43.0425	42.8640
.31558E+07	74.7296	60.7046	60.5396	60.3622
.63116E+07	81.5792	68.5215	68.3576	68.1810
.94673E+07	86.3503	73.9158	73.7527	73.5766
.12623E+08	90.0929	78.1228	77.9603	77.7848
.15779E+08	93.1956	81.5954	81.4335	81.2584
.18935E+08	95.8565	84.5644	84.4030	84.2283
.22090E+08	98.1979	87.1697	87.0088	86.8346
.25246E+08	100.273	89.4750	89.3146	89.1407
.28402E+08	102.147	91.5527	91.3927	91.2192

.31558E+08	103.871	93.4611	93.3016	93.1285
.63115E+08	116.143	106.978	106.825	106.657
.94673E+08	124.047	115.627	115.477	115.315
.12623E+09	130.292	122.432	122.286	122.128
.15779E+09	135.695	128.298	128.156	128.002
.18935E+09	140.247	133.229	133.091	132.941
.22090E+09	144.016	137.312	137.176	137.030
.25246E+09	147.365	140.936	140.803	140.659
.28402E+09	149.890	143.680	143.550	143.409
.31558E+09	151.980	145.961	145.833	145.695
.63115E+09	167.082	162.411	162.303	162.186
.94673E+09	176.881	173.043	172.949	172.847
.12623E+10	180.959	177.621	177.538	177.447
.15779E+10	182.617	179.625	179.549	179.467
.18935E+10	183.144	180.407	180.337	180.262
.22090E+10	182.917	180.370	180.305	180.236
.25246E+10	181.952	179.545	179.485	179.419
.28402E+10	180.999	178.704	178.646	178.584
.31558E+10	180.067	177.861	177.806	177.746
.63115E+10	174.918	173.054	173.009	172.960
.94673E+10	170.388	168.558	168.514	168.467
.12623E+11	167.994	166.181	166.138	166.092
.15779E+11	166.442	164.645	164.603	164.558
.18935E+11	164.634	162.844	162.803	162.758
.22090E+11	162.479	160.686	160.646	160.602
.25246E+11	160.116	158.315	158.275	158.231
.28402E+11	157.833	156.022	155.982	155.939
.31558E+11	155.760	153.940	153.900	153.857

 * Temp. Prof. from center to upper right (135 deg.) z=glass top*

VARIABLE 2 IS AT NODE 1206 ITEM= TEMP COMP= NAME= t01i135

*** WARNING *** CP= 35926.370 TIME= 10:43:38
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 885 ITEM= TEMP COMP= NAME= t01o135

VARIABLE 4 IS AT NODE 887 ITEM= TEMP COMP= NAME= h01i135

VARIABLE 5 IS AT NODE 849 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 6 IS AT NODE 866 ITEM= TEMP COMP= NAME= h01o135

VARIABLE 7 IS AT NODE 857 ITEM= TEMP COMP= NAME= s01i135

VARIABLE 8 IS AT NODE 1196 ITEM= TEMP COMP= NAME= s01o135

VARIABLE 9 IS AT NODE 1394 ITEM= TEMP COMP= NAME= i01i135

VARIABLE 10 IS AT NODE 1404 ITEM= TEMP COMP= NAME= i01o135

VARIABLE 11 IS AT NODE 2146 ITEM= TEMP COMP= NAME= o01o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
 VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2 NSOL	1206 TEMP	t01i135	86.17	31.56	192.0	.1578E+10
3 NSOL	885 TEMP	t01o135	86.20	31.56	192.0	.1578E+10
4 NSOL	887 TEMP	h01i135	99.23	31.56	199.5	.1262E+10
5 NSOL	849 TEMP	c01i135	98.59	31.56	200.2	.1262E+10
6 NSOL	866 TEMP	h01o135	85.54	31.56	194.5	.1578E+10
7 NSOL	857 TEMP	s01i135	59.74	.1000E-05	183.2	.1893E+10
8 NSOL	1196 TEMP	s01o135	59.65	.1000E-05	183.1	.1893E+10
9 NSOL	1394 TEMP	i01i135	43.14	.1000E-05	180.4	.1893E+10

10 NSOL 1404 TEMP i01o135 42.97 .1000E-05 180.3 .1893E+10
 11 NSOL 2146 TEMP o01o135 42.79 .1000E-05 180.2 .1893E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:40 OCT 28, 1995 CP= 35928.300
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1206 TEMP t01i135	885 TEMP t01o135	887 TEMP h01i135	849 TEMP c01i135	866 TEMP h01o135	857 TEMP s01i135
.10000E-05	86.1676	86.2039	99.2267	98.5907	85.5385	59.7436
.20000E-05	86.1669	86.2032	99.2259	98.5901	85.5384	59.7442
31.558	86.1660	86.2024	99.2251	98.5894	85.5377	59.7436
.31558E+07	99.8126	99.8491	112.855	112.460	99.8442	74.7739
.63116E+07	106.024	106.061	119.059	118.776	106.363	81.6233
.94673E+07	110.351	110.387	123.378	123.172	110.901	86.3943
.12623E+08	113.741	113.777	126.758	126.613	114.457	90.1368
.15779E+08	116.548	116.585	129.556	129.461	117.402	93.2393
.18935E+08	118.953	118.990	131.950	131.898	119.923	95.9001
.22090E+08	121.068	121.104	134.053	134.039	122.140	98.2414
.25246E+08	122.940	122.976	135.914	135.932	124.102	100.317
.28402E+08	124.629	124.665	137.590	137.639	125.872	102.190
.31558E+08	126.181	126.217	139.130	139.205	127.497	103.914
.63115E+08	137.172	137.207	149.981	150.246	138.995	116.186
.94673E+08	144.189	144.224	156.847	157.224	146.310	124.088
.12623E+09	149.703	149.738	162.206	162.668	152.042	130.333
.15779E+09	154.461	154.496	166.810	167.340	156.975	135.735
.18935E+09	158.450	158.483	170.642	171.226	161.097	140.287
.22090E+09	161.725	161.758	173.760	174.384	164.469	144.055
.25246E+09	164.621	164.654	176.503	177.160	167.444	147.403
.28402E+09	166.756	166.789	178.482	179.161	169.625	149.927
.31558E+09	168.494	168.526	180.066	180.761	171.392	152.017
.63115E+09	180.807	180.836	190.995	191.756	183.771	167.115
.94673E+09	188.640	188.665	197.705	198.465	191.507	176.910
.12623E+10	191.368	191.390	199.513	200.225	194.023	180.985
.15779E+10	192.023	192.043	199.425	200.081	194.462	182.640
.18935E+10	191.779	191.798	198.582	199.186	194.025	183.166
.22090E+10	190.953	190.970	197.273	197.831	193.031	182.937
.25246E+10	189.527	189.543	195.456	195.972	191.457	181.971
.28402E+10	188.203	188.218	193.817	194.299	190.014	181.017
.31558E+10	186.973	186.988	192.333	192.787	188.686	180.084
.63115E+10	180.655	180.667	185.007	185.350	181.978	174.932
.94673E+10	175.926	175.937	180.049	180.354	177.126	170.401
.12623E+11	173.430	173.441	177.437	177.724	174.568	168.007
.15779E+11	171.796	171.807	175.720	175.993	172.894	166.454
.18935E+11	169.932	169.942	173.785	174.046	170.989	164.647
.22090E+11	167.737	167.748	171.529	171.777	168.755	162.491
.25246E+11	165.348	165.359	169.085	169.321	166.326	160.128
.28402E+11	163.044	163.054	166.733	166.956	163.984	157.845
.31558E+11	160.951	160.962	164.596	164.809	161.859	155.771

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:40 OCT 28, 1995 CP= 35928.310
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1196 TEMP	1394 TEMP	1404 TEMP	2146 TEMP

	s01o135	i01i135	i01o135	o01o135
.10000E-05	59.6549	43.1423	42.9749	42.7949
.20000E-05	59.6555	43.1451	42.9777	42.7977
31.558	59.6549	43.1448	42.9774	42.7974
.31558E+07	74.6887	60.6462	60.4809	60.3022
.63116E+07	81.5396	68.4659	68.3017	68.1237
.94673E+07	86.3116	73.8620	73.6985	73.5211
.12623E+08	90.0549	78.0704	77.9076	77.7307
.15779E+08	93.1582	81.5441	81.3819	81.2055
.18935E+08	95.8197	84.5140	84.3523	84.1763
.22090E+08	98.1615	87.1202	86.9590	86.7834
.25246E+08	100.237	89.4262	89.2654	89.0903
.28402E+08	102.112	91.5046	91.3442	91.1694
.31558E+08	103.836	93.4136	93.2537	93.0793
.63115E+08	116.111	106.935	106.781	106.612
.94673E+08	124.016	115.586	115.436	115.273
.12623E+09	130.262	122.394	122.248	122.089
.15779E+09	135.667	128.261	128.119	127.964
.18935E+09	140.220	133.195	133.056	132.905
.22090E+09	143.990	137.278	137.142	136.995
.25246E+09	147.340	140.903	140.770	140.626
.28402E+09	149.865	143.649	143.519	143.377
.31558E+09	151.956	145.930	145.803	145.663
.63115E+09	167.063	162.387	162.278	162.160
.94673E+09	176.865	173.023	172.928	172.826
.12623E+10	180.945	177.604	177.520	177.429
.15779E+10	182.604	179.609	179.533	179.450
.18935E+10	183.132	180.392	180.322	180.247
.22090E+10	182.906	180.356	180.292	180.221
.25246E+10	181.941	179.533	179.472	179.406
.28402E+10	180.989	178.691	178.634	178.571
.31558E+10	180.058	177.849	177.794	177.734
.63115E+10	174.910	173.044	172.999	172.949
.94673E+10	170.380	168.548	168.505	168.457
.12623E+11	167.986	166.171	166.129	166.083
.15779E+11	166.434	164.635	164.594	164.548
.18935E+11	164.627	162.835	162.793	162.749
.22090E+11	162.471	160.677	160.636	160.592
.25246E+11	160.109	158.306	158.266	158.222
.28402E+11	157.826	156.013	155.973	155.929
.31558E+11	155.752	153.930	153.891	153.847

 * Can. Center Line Temperature Profile in Quad 1 WP Top to Bot *

VARIABLE 2 IS AT NODE 2751 ITEM= TEMP COMP= NAME= ot1o135

*** WARNING *** CP= 35928.520 TIME= 10:43:40
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 2714 ITEM= TEMP COMP= NAME= ot1i135

VARIABLE 4 IS AT NODE 1968 ITEM= TEMP COMP= NAME= it1o135

VARIABLE 5 IS AT NODE 1931 ITEM= TEMP COMP= NAME= it1i135

VARIABLE 6 IS AT NODE 1088 ITEM= TEMP COMP= NAME= st1o135

VARIABLE 7 IS AT NODE 1082 ITEM= TEMP COMP= NAME= st1i135

VARIABLE 8 IS AT NODE 849 ITEM= TEMP COMP= NAME= ht1i135

VARIABLE 9 IS AT NODE 853 ITEM= TEMP COMP= NAME= gt1i135

VARIABLE 10 IS AT NODE 1 ITEM= TEMP COMP= NAME= c01i135

VARIABLE 11 IS AT NODE 683 ITEM= TEMP COMP= NAME= gb1i135

VARIABLE 12 IS AT NODE 684 ITEM= TEMP COMP= NAME= gb1h135
 VARIABLE 13 IS AT NODE 679 ITEM= TEMP COMP= NAME= sb1i135
 VARIABLE 14 IS AT NODE 962 ITEM= TEMP COMP= NAME= sb1o135
 VARIABLE 15 IS AT NODE 1640 ITEM= TEMP COMP= NAME= ib1i135
 VARIABLE 16 IS AT NODE 1677 ITEM= TEMP COMP= NAME= ib1o135
 VARIABLE 17 IS AT NODE 2751 ITEM= TEMP COMP= NAME= ob1o135

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	2751 TEMP	ot1o135	31.17	.1000E-05	178.2	.2209E+10
3	NSOL	2714 TEMP	ot1i135	31.20	.1000E-05	178.2	.2209E+10
4	NSOL	1968 TEMP	it1o135	40.79	.1000E-05	180.3	.1893E+10
5	NSOL	1931 TEMP	it1i135	40.80	.1000E-05	180.3	.1893E+10
6	NSOL	1088 TEMP	st1o135	42.35	.1000E-05	180.2	.1893E+10
7	NSOL	1082 TEMP	st1i135	42.36	.1000E-05	180.2	.1893E+10
8	NSOL	849 TEMP	ht1i135	98.59	31.56	200.2	.1262E+10
9	NSOL	853 TEMP	gt1i135	104.7	31.56	202.1	.1262E+10
10	NSOL	1 TEMP	c01i135	110.8	31.56	204.0	.1262E+10
11	NSOL	683 TEMP	gb1i135	112.0	31.56	204.1	.1262E+10
12	NSOL	684 TEMP	gb1h135	110.3	31.56	204.3	.1262E+10
13	NSOL	679 TEMP	sb1i135	76.37	31.56	187.5	.1893E+10
14	NSOL	962 TEMP	sb1o135	76.14	31.56	187.4	.1893E+10
15	NSOL	1640 TEMP	ib1i135	51.47	.1000E-05	182.5	.1893E+10
16	NSOL	1677 TEMP	ib1o135	50.95	.1000E-05	182.3	.1893E+10
17	NSOL	2751 TEMP	ob1o135	31.17	.1000E-05	178.2	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:43 OCT 28, 1995 CP= 35931.730
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2751 TEMP ot1o135	2714 TEMP ot1i135	1968 TEMP it1o135	1931 TEMP it1i135	1088 TEMP st1o135	1082 TEMP st1i135
.10000E-05	31.1723	31.2031	40.7881	40.8004	42.3453	42.3622
.20000E-05	31.1735	31.2043	40.7908	40.8031	42.3478	42.3647
31.558	31.1734	31.2042	40.7906	40.8029	42.3475	42.3644
.31558E+07	50.0948	50.1219	58.7942	58.8040	59.7983	59.8134
.63116E+07	58.4974	58.5230	66.8100	66.8187	67.6198	67.6341
.94673E+07	64.2769	64.3016	72.3319	72.3399	73.0244	73.0382
.12623E+08	68.7763	68.8002	76.6337	76.6412	77.2431	77.2566
.15779E+08	72.4850	72.5083	80.1816	80.1887	80.7275	80.7407
.18935E+08	75.6526	75.6754	83.2129	83.2197	83.7081	83.7210
.22090E+08	78.4298	78.4522	85.8716	85.8780	86.3246	86.3374
.25246E+08	80.8856	80.9076	88.2229	88.2290	88.6406	88.6532
.28402E+08	83.0975	83.1191	90.3411	90.3471	90.7286	90.7410
.31558E+08	85.1282	85.1495	92.2861	92.2919	92.6470	92.6592
.63115E+08	99.4915	99.5107	106.035	106.039	106.240	106.251
.94673E+08	108.684	108.702	114.817	114.821	114.945	114.955
.12623E+09	115.906	115.923	121.719	121.722	121.796	121.805
.15779E+09	122.120	122.136	127.661	127.663	127.700	127.709
.18935E+09	127.342	127.357	132.652	132.655	132.664	132.673
.22090E+09	131.666	131.681	136.782	136.784	136.773	136.782
.25246E+09	135.504	135.518	140.445	140.447	140.421	140.430
.28402E+09	138.422	138.436	143.220	143.222	143.185	143.193
.31558E+09	140.854	140.867	145.526	145.527	145.482	145.490

.63115E+09	158.400	158.410	162.133	162.133	162.047	162.054
.94673E+09	169.723	169.731	172.846	172.846	172.750	172.756
.12623E+10	174.729	174.736	177.461	177.461	177.369	177.374
.15779E+10	177.031	177.037	179.484	179.484	179.399	179.403
.18935E+10	178.036	178.042	180.279	180.279	180.200	180.204
.22090E+10	178.167	178.173	180.250	180.250	180.177	180.181
.25246E+10	177.468	177.473	179.430	179.430	179.362	179.365
.28402E+10	176.726	176.731	178.591	178.591	178.527	178.530
.31558E+10	175.963	175.967	177.750	177.750	177.690	177.693
.63115E+10	171.463	171.467	172.951	172.951	172.906	172.909
.94673E+10	167.005	167.009	168.449	168.449	168.410	168.413
.12623E+11	164.647	164.651	166.070	166.070	166.034	166.036
.15779E+11	163.128	163.132	164.532	164.532	164.498	164.501
.18935E+11	161.336	161.340	162.729	162.729	162.697	162.700
.22090E+11	159.181	159.185	160.568	160.568	160.538	160.541
.25246E+11	156.808	156.811	158.193	158.193	158.166	158.168
.28402E+11	154.511	154.515	155.895	155.895	155.871	155.874
.31558E+11	152.425	152.429	153.809	153.809	153.787	153.790

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:43 OCT 28, 1995 CP= 35931.740
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	849 TEMP ht1i135	853 TEMP gt1i135	1 TEMP c01i135	683 TEMP gb1i135	684 TEMP gb1h135	679 TEMP sb1i135
.10000E-05	98.5907	104.689	110.781	111.963	110.353	76.3742
.20000E-05	98.5901	104.688	110.779	111.961	110.351	76.3740
31.558	98.5894	104.687	110.778	111.960	110.350	76.3731
.31558E+07	112.460	118.020	123.556	124.526	123.229	89.9506
.63116E+07	118.776	124.104	129.403	130.285	129.128	96.1819
.94673E+07	123.172	128.345	133.484	134.311	133.248	100.540
.12623E+08	126.613	131.666	136.683	137.468	136.480	103.965
.15779E+08	129.461	134.416	139.333	140.085	139.157	106.808
.18935E+08	131.898	136.770	141.603	142.326	141.450	109.248
.22090E+08	134.039	138.838	143.598	144.297	143.465	111.397
.25246E+08	135.932	140.668	145.363	146.041	145.248	113.304
.28402E+08	137.639	142.317	146.954	147.614	146.856	115.026
.31558E+08	139.205	143.831	148.414	149.058	148.332	116.610
.63115E+08	150.246	154.498	158.703	159.236	158.732	127.885
.94673E+08	157.224	161.235	165.198	165.667	165.298	135.146
.12623E+09	162.668	166.488	170.262	170.683	170.415	140.882
.15779E+09	167.340	170.997	174.608	174.991	174.805	145.848
.18935E+09	171.226	174.744	178.218	178.569	178.450	150.027
.22090E+09	174.384	177.785	181.141	181.468	181.401	153.478
.25246E+09	177.160	180.455	183.706	184.011	183.988	156.541
.28402E+09	179.161	182.369	185.532	185.821	185.829	158.826
.31558E+09	180.761	183.890	186.977	187.252	187.284	160.704
.63115E+09	191.756	194.297	196.803	196.989	197.164	174.188
.94673E+09	198.465	200.613	202.731	202.868	203.101	182.897
.12623E+10	200.225	202.118	203.986	204.100	204.334	186.259
.15779E+10	200.081	201.790	203.477	203.579	203.796	187.396
.18935E+10	199.186	200.757	202.308	202.401	202.599	187.528
.22090E+10	197.831	199.295	200.741	200.829	201.007	186.997
.25246E+10	195.972	197.356	198.723	198.808	198.966	185.801
.28402E+10	194.299	195.618	196.923	197.005	197.147	184.663
.31558E+10	192.787	194.055	195.308	195.389	195.517	183.583
.63115E+10	185.350	186.416	187.471	187.546	187.620	177.855
.94673E+10	180.354	181.392	182.421	182.499	182.546	173.238
.12623E+11	177.724	178.748	179.763	179.843	179.877	170.799
.15779E+11	175.993	177.005	178.009	178.090	178.116	169.211
.18935E+11	174.046	175.051	176.048	176.130	176.147	167.380
.22090E+11	171.777	172.779	173.773	173.858	173.864	165.212

.25246E+11	169.321	170.322	171.317	171.404	171.399	162.844
.28402E+11	166.956	167.958	168.954	169.044	169.028	160.558
.31558E+11	164.809	165.812	166.808	166.900	166.875	158.483

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:43 OCT 28, 1995 CP= 35931.750
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	962 TEMP sb1o135	1640 TEMP ib11135	1677 TEMP ib1o135	2751 TEMP ob1o135
.10000E-05	76.1444	51.4669	50.9536	31.1723
.20000E-05	76.1443	51.4715	50.9581	31.1735
31.558	76.1434	51.4710	50.9576	31.1734
.31558E+07	89.7239	68.1334	67.6207	50.0948
.63116E+07	95.9571	75.6209	75.1090	58.4974
.94673E+07	100.317	80.8017	80.2905	64.2769
.12623E+08	103.743	84.8478	84.3374	68.7763
.15779E+08	106.587	88.1909	87.6813	72.4850
.18935E+08	109.028	91.0512	90.5423	75.6526
.22090E+08	111.179	93.5627	93.0546	78.4298
.25246E+08	113.086	95.7847	95.2785	80.8856
.28402E+08	114.808	97.7877	97.2832	83.0975
.31558E+08	116.394	99.6278	99.1250	85.1282
.63115E+08	127.675	112.646	112.157	99.4915
.94673E+08	134.941	120.981	120.502	108.684
.12623E+09	140.681	127.538	127.071	115.906
.15779E+09	145.651	133.193	132.737	122.120
.18935E+09	149.834	137.946	137.499	127.342
.22090E+09	153.287	141.875	141.437	131.666
.25246E+09	156.354	145.362	144.932	135.504
.28402E+09	158.642	147.991	147.569	138.422
.31558E+09	160.523	150.169	149.754	140.854
.63115E+09	174.031	165.839	165.484	158.400
.94673E+09	182.759	175.947	175.637	169.723
.12623E+10	186.135	180.177	179.900	174.729
.15779E+10	187.284	181.926	181.675	177.031
.18935E+10	187.425	182.514	182.283	178.036
.22090E+10	186.901	182.327	182.113	178.167
.25246E+10	185.711	181.388	181.186	177.468
.28402E+10	184.578	180.454	180.263	176.726
.31558E+10	183.502	179.538	179.355	175.963
.63115E+10	177.788	174.444	174.294	171.463
.94673E+10	173.174	169.900	169.758	167.005
.12623E+11	170.737	167.500	167.361	164.647
.15779E+11	169.150	165.945	165.808	163.128
.18935E+11	167.320	164.131	163.996	161.336
.22090E+11	165.153	161.965	161.832	159.181
.25246E+11	162.786	159.589	159.457	156.808
.28402E+11	160.501	157.292	157.162	154.511
.31558E+11	158.425	155.206	155.077	152.425

 * Can. Center Line Temperature Profile in Quad 4 WP Top to Bot *

VARIABLE 2 IS AT NODE 9855 ITEM= TEMP COMP= NAME= ot4o045

*** WARNING *** CP= 35931.980 TIME= 10:43:43
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 9818 ITEM= TEMP COMP= NAME= ot4i045

VARIABLE 4 IS AT NODE 9546 ITEM= TEMP COMP= NAME= it4o045
 VARIABLE 5 IS AT NODE 9509 ITEM= TEMP COMP= NAME= it4i045
 VARIABLE 6 IS AT NODE 8352 ITEM= TEMP COMP= NAME= st4o045
 VARIABLE 7 IS AT NODE 8346 ITEM= TEMP COMP= NAME= st4i045
 VARIABLE 8 IS AT NODE 8234 ITEM= TEMP COMP= NAME= ht4i045
 VARIABLE 9 IS AT NODE 8238 ITEM= TEMP COMP= NAME= gt4i045
 VARIABLE 10 IS AT NODE 7642 ITEM= TEMP COMP= NAME= c04i045
 VARIABLE 11 IS AT NODE 7654 ITEM= TEMP COMP= NAME= gb4i045
 VARIABLE 12 IS AT NODE 7655 ITEM= TEMP COMP= NAME= gb4h045
 VARIABLE 13 IS AT NODE 7650 ITEM= TEMP COMP= NAME= sb4i045
 VARIABLE 14 IS AT NODE 7871 ITEM= TEMP COMP= NAME= sb4o045
 VARIABLE 15 IS AT NODE 8934 ITEM= TEMP COMP= NAME= ib4i045
 VARIABLE 16 IS AT NODE 8971 ITEM= TEMP COMP= NAME= ib4o045
 VARIABLE 17 IS AT NODE 9855 ITEM= TEMP COMP= NAME= ob4o045

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
 VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2	NSOL	9855 TEMP	ot4o045	31.19	.1000E-05	178.2	.2209E+10
3	NSOL	9818 TEMP	ot4i045	31.22	.1000E-05	178.2	.2209E+10
4	NSOL	9546 TEMP	it4o045	40.80	.1000E-05	180.3	.1893E+10
5	NSOL	9509 TEMP	it4i045	40.81	.1000E-05	180.3	.1893E+10
6	NSOL	8352 TEMP	st4o045	42.36	.1000E-05	180.2	.1893E+10
7	NSOL	8346 TEMP	st4i045	42.38	.1000E-05	180.2	.1893E+10
8	NSOL	8234 TEMP	ht4i045	98.61	31.56	200.2	.1262E+10
9	NSOL	8238 TEMP	gt4i045	104.7	31.56	202.1	.1262E+10
10	NSOL	7642 TEMP	c04i045	110.8	31.56	204.0	.1262E+10
11	NSOL	7654 TEMP	gb4i045	112.0	31.56	204.1	.1262E+10
12	NSOL	7655 TEMP	gb4h045	110.4	31.56	204.3	.1262E+10
13	NSOL	7650 TEMP	sb4i045	76.40	31.56	187.5	.1893E+10
14	NSOL	7871 TEMP	sb4o045	76.17	31.56	187.4	.1893E+10
15	NSOL	8934 TEMP	ib4i045	51.51	.1000E-05	182.5	.1893E+10
16	NSOL	8971 TEMP	ib4o045	50.99	.1000E-05	182.3	.1893E+10
17	NSOL	9855 TEMP	ob4o045	31.19	.1000E-05	178.2	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:47 OCT 28, 1995 CP= 35935.230
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9855 TEMP ot4o045	9818 TEMP ot4i045	9546 TEMP it4o045	9509 TEMP it4i045	8352 TEMP st4o045	8346 TEMP st4i045
.10000E-05	31.1866	31.2170	40.8027	40.8149	42.3613	42.3782
.20000E-05	31.1878	31.2182	40.8054	40.8177	42.3638	42.3807
31.558	31.1877	31.2181	40.8051	40.8174	42.3635	42.3804
.31558E+07	50.1066	50.1334	58.8068	58.8166	59.8121	59.8273
.63116E+07	58.5081	58.5335	66.8217	66.8304	67.6327	67.6471
.94673E+07	64.2871	64.3115	72.3431	72.3512	73.0367	73.0506

.12623E+08	68.7859	68.8096	76.6446	76.6521	77.2550	77.2685
.15779E+08	72.4943	72.5174	80.1921	80.1992	80.7390	80.7523
.18935E+08	75.6616	75.6842	83.2232	83.2299	83.7193	83.7323
.22090E+08	78.4385	78.4607	85.8816	85.8881	86.3356	86.3484
.25246E+08	80.8941	80.9159	88.2327	88.2389	88.6514	88.6640
.28402E+08	83.1058	83.1272	90.3508	90.3567	90.7392	90.7516
.31558E+08	85.1363	85.1574	92.2956	92.3014	92.6574	92.6696
.63115E+08	99.4984	99.5175	106.043	106.047	106.249	106.260
.94673E+08	108.691	108.708	114.825	114.828	114.953	114.963
.12623E+09	115.912	115.929	121.727	121.730	121.803	121.813
.15779E+09	122.126	122.141	127.668	127.670	127.707	127.716
.18935E+09	127.347	127.362	132.659	132.661	132.671	132.680
.22090E+09	131.671	131.685	136.788	136.790	136.780	136.789
.25246E+09	135.508	135.522	140.451	140.453	140.428	140.436
.28402E+09	138.427	138.440	143.226	143.228	143.191	143.199
.31558E+09	140.859	140.872	145.531	145.533	145.488	145.496
.63115E+09	158.403	158.413	162.137	162.138	162.052	162.058
.94673E+09	169.725	169.734	172.849	172.849	172.754	172.760
.12623E+10	174.731	174.738	177.464	177.464	177.373	177.377
.15779E+10	177.033	177.039	179.487	179.487	179.402	179.406
.18935E+10	178.037	178.043	180.282	180.282	180.203	180.207
.22090E+10	178.169	178.175	180.253	180.253	180.180	180.183
.25246E+10	177.470	177.475	179.432	179.432	179.364	179.367
.28402E+10	176.727	176.732	178.593	178.593	178.530	178.533
.31558E+10	175.964	175.969	177.752	177.752	177.693	177.696
.63115E+10	171.464	171.468	172.953	172.953	172.908	172.911
.94673E+10	167.006	167.010	168.451	168.451	168.412	168.415
.12623E+11	164.648	164.652	166.071	166.071	166.035	166.038
.15779E+11	163.129	163.133	164.534	164.534	164.500	164.503
.18935E+11	161.337	161.341	162.731	162.731	162.699	162.701
.22090E+11	159.182	159.186	160.569	160.570	160.540	160.543
.25246E+11	156.809	156.813	158.194	158.194	158.168	158.170
.28402E+11	154.512	154.516	155.897	155.897	155.873	155.875
.31558E+11	152.426	152.430	153.810	153.811	153.789	153.791

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:47 OCT 28, 1995 CP= 35935.250
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8234 TEMP ht4i045	8238 TEMP gt4i045	7642 TEMP c04i045	7654 TEMP gb4i045	7655 TEMP gb4h045	7650 TEMP sb4i045
.10000E-05	98.6161	104.715	110.809	111.991	110.379	76.4032
.20000E-05	98.6156	104.714	110.806	111.988	110.378	76.4030
31.558	98.6148	104.713	110.805	111.987	110.377	76.4021
.31558E+07	112.484	118.045	123.582	124.552	123.255	89.9779
.63116E+07	118.799	124.128	129.427	130.310	129.153	96.2085
.94673E+07	123.194	128.368	133.508	134.335	133.272	100.566
.12623E+08	126.635	131.689	136.707	137.492	136.503	103.990
.15779E+08	129.483	134.439	139.357	140.109	139.180	106.833
.18935E+08	131.919	136.792	141.626	142.350	141.473	109.273
.22090E+08	134.060	138.860	143.621	144.321	143.488	111.422
.25246E+08	135.953	140.690	145.385	146.065	145.271	113.328
.28402E+08	137.659	142.339	146.976	147.637	146.878	115.050
.31558E+08	139.226	143.852	148.436	149.081	148.354	116.634
.63115E+08	150.265	154.518	158.724	159.257	158.753	127.908
.94673E+08	157.242	161.254	165.218	165.687	165.318	135.168
.12623E+09	162.685	166.506	170.281	170.702	170.433	140.903
.15779E+09	167.356	171.015	174.627	175.010	174.823	145.868
.18935E+09	171.241	174.761	178.235	178.587	178.467	150.046
.22090E+09	174.400	177.802	181.159	181.485	181.417	153.496
.25246E+09	177.175	180.471	183.722	184.028	184.004	156.558
.28402E+09	179.176	182.384	185.548	185.837	185.845	158.843

.31558E+09	180.775	183.905	186.992	187.268	187.300	160.721
.63115E+09	191.768	194.310	196.816	197.002	197.176	174.202
.94673E+09	198.475	200.623	202.742	202.879	203.112	182.909
.12623E+10	200.234	202.127	203.995	204.110	204.343	186.269
.15779E+10	200.089	201.799	203.486	203.588	203.805	187.405
.18935E+10	199.193	200.764	202.316	202.409	202.606	187.537
.22090E+10	197.837	199.302	200.749	200.837	201.014	187.005
.25246E+10	195.978	197.362	198.730	198.815	198.973	185.809
.28402E+10	194.305	195.625	196.930	197.012	197.154	184.670
.31558E+10	192.792	194.061	195.315	195.396	195.524	183.590
.63115E+10	185.354	186.421	187.477	187.551	187.625	177.860
.94673E+10	180.358	181.397	182.426	182.504	182.552	173.243
.12623E+11	177.728	178.752	179.768	179.848	179.882	170.805
.15779E+11	175.998	177.010	178.014	178.095	178.121	169.216
.18935E+11	174.050	175.056	176.053	176.135	176.152	167.385
.22090E+11	171.782	172.784	173.779	173.863	173.869	165.217
.25246E+11	169.325	170.327	171.322	171.409	171.404	162.849
.28402E+11	166.960	167.963	168.959	169.049	169.033	160.564
.31558E+11	164.813	165.816	166.813	166.906	166.880	158.488

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:47 OCT 28, 1995 CP= 35935.260
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7871 TEMP	8934 TEMP	8971 TEMP	9855 TEMP
	sb4o045	ib4i045	ib4o045	ob4o045
.10000E-05	76.1735	51.5065	50.9933	31.1866
.20000E-05	76.1733	51.5111	50.9978	31.1878
31.558	76.1724	51.5106	50.9973	31.1877
.31558E+07	89.7513	68.1695	67.6570	50.1066
.63116E+07	95.9837	75.6556	75.1439	58.5081
.94673E+07	100.343	80.8354	80.3244	64.2871
.12623E+08	103.769	84.8807	84.3705	68.7859
.15779E+08	106.612	88.2233	87.7138	72.4943
.18935E+08	109.053	91.0830	90.5743	75.6616
.22090E+08	111.203	93.5940	93.0862	78.4385
.25246E+08	113.110	95.8156	95.3096	80.8941
.28402E+08	114.833	97.8182	97.3140	83.1058
.31558E+08	116.417	99.6580	99.1555	85.1363
.63115E+08	127.697	112.674	112.185	99.4984
.94673E+08	134.962	121.007	120.529	108.691
.12623E+09	140.701	127.563	127.096	115.912
.15779E+09	145.671	133.217	132.761	122.126
.18935E+09	149.853	137.969	137.522	127.347
.22090E+09	153.306	141.897	141.459	131.671
.25246E+09	156.371	145.383	144.954	135.508
.28402E+09	158.659	148.012	147.590	138.427
.31558E+09	160.540	150.189	149.775	140.859
.63115E+09	174.045	165.855	165.500	158.403
.94673E+09	182.771	175.961	175.651	169.725
.12623E+10	186.146	180.189	179.912	174.731
.15779E+10	187.293	181.937	181.686	177.033
.18935E+10	187.434	182.524	182.293	178.037
.22090E+10	186.909	182.336	182.122	178.169
.25246E+10	185.719	181.397	181.195	177.470
.28402E+10	184.585	180.462	180.272	176.727
.31558E+10	183.509	179.546	179.363	175.964
.63115E+10	177.794	174.450	174.301	171.464
.94673E+10	173.180	169.907	169.764	167.006
.12623E+11	170.743	167.506	167.367	164.648
.15779E+11	169.156	165.951	165.815	163.129
.18935E+11	167.326	164.137	164.003	161.337
.22090E+11	165.158	161.971	161.838	159.182

.25246E+11	162.791	159.595	159.464	156.809
.28402E+11	160.506	157.298	157.168	154.512
.31558E+11	158.431	155.213	155.083	152.426

 * Can. Inner Surface Temperature Prof. in Quad 1 WP Top - Bot *

VARIABLE 2 IS AT NODE 2763 ITEM= TEMP COMP= NAME= ot1oise

*** WARNING *** CP= 35935.460 TIME= 10:43:47
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 2726 ITEM= TEMP COMP= NAME= ot1iise

VARIABLE 4 IS AT NODE 1980 ITEM= TEMP COMP= NAME= it1oise

VARIABLE 5 IS AT NODE 1943 ITEM= TEMP COMP= NAME= it1iise

VARIABLE 6 IS AT NODE 1281 ITEM= TEMP COMP= NAME= st1oise

VARIABLE 7 IS AT NODE 1247 ITEM= TEMP COMP= NAME= st1iise

VARIABLE 8 IS AT NODE 1206 ITEM= TEMP COMP= NAME= ht1iise

VARIABLE 9 IS AT NODE 1207 ITEM= TEMP COMP= NAME= gt1iise

VARIABLE 10 IS AT NODE 63 ITEM= TEMP COMP= NAME= c01iise

VARIABLE 11 IS AT NODE 1034 ITEM= TEMP COMP= NAME= gb1iise

VARIABLE 12 IS AT NODE 1035 ITEM= TEMP COMP= NAME= gb1hise

VARIABLE 13 IS AT NODE 1033 ITEM= TEMP COMP= NAME= sb1iise

VARIABLE 14 IS AT NODE 1071 ITEM= TEMP COMP= NAME= sb1oise

VARIABLE 15 IS AT NODE 1652 ITEM= TEMP COMP= NAME= ib1iise

VARIABLE 16 IS AT NODE 1689 ITEM= TEMP COMP= NAME= ib1oise

VARIABLE 17 IS AT NODE 2763 ITEM= TEMP COMP= NAME= ob1oise

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES						
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM AT TIME
2	NSOL	2763 TEMP	ot1oise	30.51	.1000E-05	178.1 .2209E+10
3	NSOL	2726 TEMP	ot1iise	30.53	.1000E-05	178.1 .2209E+10
4	NSOL	1980 TEMP	it1oise	45.25	.1000E-05	181.6 .1893E+10
5	NSOL	1943 TEMP	it1iise	45.28	.1000E-05	181.6 .1893E+10
6	NSOL	1281 TEMP	st1oise	50.69	.1000E-05	182.7 .1893E+10
7	NSOL	1247 TEMP	st1iise	51.08	.1000E-05	182.8 .1893E+10
8	NSOL	1206 TEMP	ht1iise	86.17	31.56	192.0 .1578E+10
9	NSOL	1207 TEMP	gt1iise	99.98	31.56	196.5 .1578E+10
10	NSOL	63 TEMP	c01iise	106.7	31.56	198.7 .1262E+10
11	NSOL	1034 TEMP	gb1iise	107.7	31.56	198.9 .1262E+10
12	NSOL	1035 TEMP	gb1hise	101.0	31.56	196.4 .1578E+10
13	NSOL	1033 TEMP	sb1iise	85.14	31.56	191.2 .1578E+10
14	NSOL	1071 TEMP	sb1oise	84.61	31.56	190.9 .1578E+10
15	NSOL	1652 TEMP	ib1iise	54.03	.1000E-05	183.7 .1893E+10
16	NSOL	1689 TEMP	ib1oise	53.45	.1000E-05	183.4 .1893E+10
17	NSOL	2763 TEMP	ob1oise	30.51	.1000E-05	178.1 .2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:50 OCT 28, 1995 CP= 35938.590
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2763 TEMP ot1oise	2726 TEMP ot1iise	1980 TEMP it1oise	1943 TEMP it1iise	1281 TEMP st1oise	1247 TEMP st1iise
.10000E-05	30.5086	30.5311	45.2464	45.2843	50.6884	51.0833
.20000E-05	30.5097	30.5322	45.2498	45.2877	50.6916	51.0865
31.558	30.5096	30.5321	45.2495	45.2874	50.6911	51.0860
.31558E+07	49.5226	49.5419	62.9482	62.9839	67.5686	67.9530
.63116E+07	57.9625	57.9805	70.8337	70.8685	75.1502	75.5309
.94673E+07	63.7667	63.7838	76.2684	76.3025	80.3941	80.7724
.12623E+08	68.2845	68.3010	80.5025	80.5361	84.4873	84.8635
.15779E+08	72.0082	72.0242	83.9945	84.0278	87.8679	88.2424
.18935E+08	75.1883	75.2039	86.9781	87.0110	90.7598	91.1327
.22090E+08	77.9763	77.9915	89.5948	89.6274	93.2981	93.6696
.25246E+08	80.4415	80.4564	91.9088	91.9411	95.5439	95.9138
.28402E+08	82.6618	82.6764	93.9931	94.0251	97.5672	97.9357
.31558E+08	84.7001	84.7144	95.9050	95.9367	99.4250	99.7922
.63115E+08	99.1144	99.1269	109.409	109.439	112.571	112.927
.94673E+08	108.339	108.350	118.029	118.058	120.976	121.323
.12623E+09	115.585	115.596	124.800	124.827	127.583	127.924
.15779E+09	121.819	121.829	130.626	130.652	133.275	133.609
.18935E+09	127.057	127.067	135.518	135.544	138.056	138.383
.22090E+09	131.395	131.404	139.561	139.586	142.005	142.326
.25246E+09	135.244	135.253	143.147	143.171	145.508	145.823
.28402E+09	138.172	138.180	145.855	145.879	148.147	148.458
.31558E+09	140.612	140.620	148.101	148.124	150.333	150.639
.63115E+09	158.215	158.221	164.247	164.266	166.041	166.306
.94673E+09	169.573	169.577	174.645	174.662	176.153	176.386
.12623E+10	174.599	174.603	179.047	179.061	180.369	180.577
.15779E+10	176.915	176.919	180.913	180.926	182.101	182.290
.18935E+10	177.930	177.934	181.587	181.599	182.674	182.848
.22090E+10	178.069	178.073	181.464	181.476	182.475	182.636
.25246E+10	177.376	177.379	180.572	180.582	181.525	181.676
.28402E+10	176.638	176.641	179.675	179.685	180.582	180.725
.31558E+10	175.878	175.881	178.789	178.798	179.658	179.795
.63115E+10	171.392	171.394	173.809	173.817	174.534	174.645
.94673E+10	166.935	166.937	169.276	169.283	169.980	170.085
.12623E+11	164.578	164.580	166.880	166.888	167.573	167.676
.15779E+11	163.059	163.062	165.331	165.338	166.015	166.116
.18935E+11	161.268	161.270	163.518	163.526	164.197	164.296
.22090E+11	159.112	159.115	161.351	161.358	162.026	162.124
.25246E+11	156.739	156.741	158.972	158.979	159.646	159.743
.28402E+11	154.442	154.444	156.671	156.678	157.345	157.441
.31558E+11	152.355	152.358	154.582	154.589	155.256	155.350

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:50 OCT 28, 1995 CP= 35938.610
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1206 TEMP ht1iise	1207 TEMP gt1iise	63 TEMP c01iise	1034 TEMP gb1iise	1035 TEMP gb1hise	1033 TEMP sb1iise
.10000E-05	86.1676	99.9854	106.664	107.683	101.052	85.1425
.20000E-05	86.1669	99.9827	106.660	107.679	101.049	85.1424
31.558	86.1660	99.9818	106.659	107.678	101.048	85.1413
.31558E+07	99.8126	112.631	118.815	119.662	113.368	98.5161
.63116E+07	106.024	118.410	124.381	125.159	119.019	104.637

.94673E+07	110.351	122.445	128.271	129.005	122.974	108.917
.12623E+08	113.741	125.608	131.323	132.024	126.080	112.276
.15779E+08	116.548	128.229	133.853	134.528	128.657	115.063
.18935E+08	118.953	130.475	136.022	136.675	130.867	117.453
.22090E+08	121.068	132.450	137.929	138.564	132.812	119.556
.25246E+08	122.940	134.199	139.618	140.237	134.535	121.421
.28402E+08	124.629	135.777	141.141	141.746	136.090	123.103
.31558E+08	126.181	137.226	142.541	143.133	137.519	124.650
.63115E+08	137.172	147.478	152.435	152.942	147.639	135.622
.94673E+08	144.189	154.004	158.728	159.185	154.098	142.652
.12623E+09	149.703	159.125	163.661	164.081	159.173	148.187
.15779E+09	154.461	163.542	167.914	168.304	163.554	152.971
.18935E+09	158.450	167.235	171.465	171.831	167.220	156.986
.22090E+09	161.725	170.253	174.361	174.708	170.219	160.286
.25246E+09	164.621	172.917	176.914	177.244	172.867	163.209
.28402E+09	166.756	174.855	178.758	179.075	174.794	165.367
.31558E+09	168.494	176.416	180.235	180.541	176.347	167.128
.63115E+09	180.807	187.358	190.523	190.754	187.248	179.637
.94673E+09	188.640	194.243	196.956	197.142	194.123	187.624
.12623E+10	191.368	196.335	198.744	198.906	196.221	190.463
.15779E+10	192.023	196.522	198.706	198.853	196.416	191.202
.18935E+10	191.779	195.920	197.932	198.068	195.822	191.023
.22090E+10	190.953	194.817	196.695	196.822	194.726	190.248
.25246E+10	189.527	193.178	194.954	195.076	193.093	188.860
.28402E+10	188.203	191.683	193.377	193.494	191.604	187.568
.31558E+10	186.973	190.317	191.944	192.058	190.242	186.364
.63115E+10	180.655	183.458	184.825	184.925	183.403	180.146
.94673E+10	175.926	178.646	179.974	180.074	178.599	175.435
.12623E+11	173.430	176.107	177.414	177.515	176.064	172.949
.15779E+11	171.796	174.439	175.729	175.829	174.398	171.323
.18935E+11	169.932	172.552	173.831	173.931	172.514	169.464
.22090E+11	167.737	170.344	171.617	171.719	170.310	167.274
.25246E+11	165.348	167.949	169.219	169.322	167.918	164.888
.28402E+11	163.044	165.641	166.909	167.015	165.614	162.587
.31558E+11	160.951	163.545	164.812	164.919	163.521	160.497

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:50 OCT 28, 1995 CP= 35938.630
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1071 TEMP	1652 TEMP	1689 TEMP	2763 TEMP
	sb1oise	ib1iise	ib1oise	ob1oise
.10000E-05	84.6108	54.0255	53.4454	30.5086
.20000E-05	84.6107	54.0307	53.4505	30.5097
31.558	84.6097	54.0302	53.4499	30.5096
.31558E+07	97.9825	70.7021	70.1122	49.5226
.63116E+07	104.104	78.1888	77.5952	57.9625
.94673E+07	108.384	83.3673	82.7714	63.7667
.12623E+08	111.744	87.4102	86.8127	68.2845
.15779E+08	114.532	90.7498	90.1511	72.0082
.18935E+08	116.923	93.6060	93.0065	75.1883
.22090E+08	119.027	96.1119	95.5132	77.9763
.25246E+08	120.892	98.3289	97.7311	80.4415
.28402E+08	122.575	100.327	99.7301	82.6618
.31558E+08	124.123	102.161	101.565	84.7001
.63115E+08	135.102	115.104	114.516	99.1144
.94673E+08	142.140	123.377	122.798	108.339
.12623E+09	147.682	129.880	129.311	115.585
.15779E+09	152.473	135.484	134.924	121.819
.18935E+09	156.494	140.190	139.639	127.057
.22090E+09	159.801	144.075	143.534	131.395
.25246E+09	162.730	147.520	146.987	135.244
.28402E+09	164.895	150.111	149.586	138.172

.31558E+09	166.661	152.253	151.736	140.612
.63115E+09	179.228	167.618	167.169	158.215
.94673E+09	187.262	177.497	177.101	169.573
.12623E+10	190.139	181.556	181.202	174.599
.15779E+10	190.908	183.172	182.851	176.915
.18935E+10	190.753	183.656	183.361	177.930
.22090E+10	189.997	183.386	183.113	178.069
.25246E+10	188.625	182.382	182.125	177.376
.28402E+10	187.345	181.396	181.153	176.638
.31558E+10	186.151	180.437	180.205	175.878
.63115E+10	179.973	175.177	174.988	171.392
.94673E+10	175.271	170.599	170.420	166.935
.12623E+11	172.789	168.181	168.007	164.578
.15779E+11	171.167	166.613	166.442	163.059
.18935E+11	169.310	164.789	164.621	161.268
.22090E+11	167.123	162.614	162.448	159.112
.25246E+11	164.739	160.230	160.067	156.739
.28402E+11	162.440	157.927	157.766	154.442
.31558E+11	160.352	155.835	155.676	152.355

 * Can. Outer Surface Temperature Prof. in Quad 1 WP Top - Bot *

VARIABLE 2 IS AT NODE 2682 ITEM= TEMP COMP= NAME= ot1oose

*** WARNING *** CP= 35938.830 TIME= 10:43:50
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 2673 ITEM= TEMP COMP= NAME= ot1iose

VARIABLE 4 IS AT NODE 1899 ITEM= TEMP COMP= NAME= it1oose

VARIABLE 5 IS AT NODE 1794 ITEM= TEMP COMP= NAME= it1iose

VARIABLE 6 IS AT NODE 1276 ITEM= TEMP COMP= NAME= st1oose

VARIABLE 7 IS AT NODE 1233 ITEM= TEMP COMP= NAME= st1iose

VARIABLE 8 IS AT NODE 1196 ITEM= TEMP COMP= NAME= ht1iose

VARIABLE 9 IS AT NODE 1197 ITEM= TEMP COMP= NAME= gt1iose

VARIABLE 10 IS AT NODE 58 ITEM= TEMP COMP= NAME= c01iose

VARIABLE 11 IS AT NODE 1019 ITEM= TEMP COMP= NAME= gb1iose

VARIABLE 12 IS AT NODE 1020 ITEM= TEMP COMP= NAME= gb1hose

VARIABLE 13 IS AT NODE 1018 ITEM= TEMP COMP= NAME= sb1iose

VARIABLE 14 IS AT NODE 1066 ITEM= TEMP COMP= NAME= sb1oose

VARIABLE 15 IS AT NODE 1529 ITEM= TEMP COMP= NAME= ib1iose

VARIABLE 16 IS AT NODE 1608 ITEM= TEMP COMP= NAME= ib1oose

VARIABLE 17 IS AT NODE 2682 ITEM= TEMP COMP= NAME= ob1oose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES
 VARI TYPE IDENTIFIERS NAME MINIMUM AT TIME MAXIMUM AT TIME

2 NSOL	2682 TEMP	ot1oose	32.84	.1000E-05	178.5	.2209E+10
3 NSOL	2673 TEMP	ot1iose	32.91	.1000E-05	178.5	.2209E+10
4 NSOL	1899 TEMP	it1oose	34.13	.1000E-05	178.8	.2209E+10
5 NSOL	1794 TEMP	it1iose	34.10	.1000E-05	178.8	.2209E+10
6 NSOL	1276 TEMP	st1oose	39.77	.1000E-05	179.5	.2209E+10

7 NSOL	1233 TEMP	st1iose	39.80	.1000E-05	179.5	.2209E+10
8 NSOL	1196 TEMP	ht1iose	59.65	.1000E-05	183.1	.1893E+10
9 NSOL	1197 TEMP	gt1iose	71.66	31.56	185.8	.1893E+10
10 NSOL	58 TEMP	c01iose	75.62	31.56	186.6	.1893E+10
11 NSOL	1019 TEMP	gb1iose	76.90	31.56	186.8	.1893E+10
12 NSOL	1020 TEMP	gb1iose	74.22	31.56	186.1	.1893E+10
13 NSOL	1018 TEMP	sb1iose	66.48	31.56	184.2	.1893E+10
14 NSOL	1066 TEMP	sb1iose	66.38	31.56	184.2	.1893E+10
15 NSOL	1529 TEMP	ib1iose	47.67	.1000E-05	181.0	.1893E+10
16 NSOL	1608 TEMP	ib1iose	47.51	.1000E-05	180.9	.1893E+10
17 NSOL	2682 TEMP	ob1iose	32.84	.1000E-05	178.5	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:53 OCT 28, 1995 CP= 35941.970
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2682 TEMP ot1iose	2673 TEMP ot1iose	1899 TEMP it1iose	1794 TEMP it1iose	1276 TEMP st1iose	1233 TEMP st1iose
.10000E-05	32.8416	32.9122	34.1306	34.0982	39.7706	39.7958
.20000E-05	32.8431	32.9137	34.1323	34.0999	39.7728	39.7979
31.558	32.8430	32.9136	34.1322	34.0997	39.7725	39.7976
.31558E+07	51.5615	51.6262	52.7361	52.7080	57.4001	57.4206
.63116E+07	59.8809	59.9431	61.0079	60.9817	65.3006	65.3191
.94673E+07	65.6057	65.6663	66.7011	66.6762	70.7569	70.7741
.12623E+08	70.0635	70.1229	71.1348	71.1109	75.0161	75.0324
.15779E+08	73.7388	73.7971	74.7905	74.7675	78.5341	78.5496
.18935E+08	76.8783	76.9358	77.9134	77.8911	81.5434	81.5582
.22090E+08	79.6312	79.6879	80.6520	80.6302	84.1852	84.1995
.25246E+08	82.0657	82.1218	83.0738	83.0526	86.5238	86.5376
.28402E+08	84.2587	84.3142	85.2555	85.2348	88.6321	88.6455
.31558E+08	86.2721	86.3271	87.2585	87.2383	90.5691	90.5821
.63115E+08	100.519	100.571	101.433	101.416	104.307	104.317
.94673E+08	109.635	109.683	110.495	110.479	113.110	113.119
.12623E+09	116.798	116.844	117.616	117.602	120.040	120.048
.15779E+09	122.963	123.007	123.746	123.733	126.013	126.020
.18935E+09	128.144	128.187	128.897	128.885	131.037	131.043
.22090E+09	132.435	132.476	133.162	133.151	135.198	135.204
.25246E+09	136.242	136.282	136.947	136.936	138.893	138.898
.28402E+09	139.137	139.175	139.822	139.812	141.696	141.701
.31558E+09	141.548	141.586	142.216	142.207	144.029	144.033
.63115E+09	158.942	158.973	159.483	159.476	160.864	160.866
.94673E+09	170.170	170.196	170.626	170.622	171.749	171.750
.12623E+10	175.118	175.141	175.518	175.515	176.489	176.490
.15779E+10	177.379	177.400	177.740	177.736	178.607	178.608
.18935E+10	178.354	178.373	178.684	178.681	179.476	179.476
.22090E+10	178.463	178.480	178.769	178.766	179.505	179.505
.25246E+10	177.746	177.763	178.035	178.032	178.729	178.729
.28402E+10	176.991	177.006	177.265	177.262	177.926	177.927
.31558E+10	176.217	176.232	176.479	176.477	177.115	177.115
.63115E+10	171.676	171.688	171.894	171.891	172.430	172.430
.94673E+10	167.212	167.224	167.423	167.421	167.950	167.951
.12623E+11	164.852	164.864	165.059	165.057	165.582	165.582
.15779E+11	163.331	163.342	163.535	163.533	164.053	164.054
.18935E+11	161.538	161.549	161.740	161.738	162.256	162.257
.22090E+11	159.382	159.394	159.583	159.581	160.101	160.101
.25246E+11	157.009	157.021	157.210	157.207	157.730	157.731
.28402E+11	154.713	154.724	154.913	154.910	155.436	155.438
.31558E+11	152.628	152.639	152.827	152.825	153.354	153.355

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:53 OCT 28, 1995 CP= 35941.980

FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1196 TEMP ht1iose	1197 TEMP gt1iose	58 TEMP c01iose	1019 TEMP gb1iose	1020 TEMP gb1iose	1018 TEMP sb1iose
.10000E-05	59.6549	71.6565	75.6248	76.9045	74.2169	66.4849
.20000E-05	59.6555	71.6560	75.6237	76.9032	74.2161	66.4853
31.558	59.6549	71.6552	75.6229	76.9023	74.2152	66.4845
.31558E+07	74.6887	85.4484	88.9600	90.0413	87.5756	80.5238
.63116E+07	81.5396	91.7709	95.0903	96.0915	93.7247	86.9695
.94673E+07	86.3116	96.1916	99.3837	100.333	98.0340	91.4800
.12623E+08	90.0549	99.6646	102.760	103.671	101.424	95.0272
.15779E+08	93.1582	102.547	105.564	106.444	104.241	97.9727
.18935E+08	95.8197	105.022	107.973	108.827	106.661	100.503
.22090E+08	98.1615	107.202	110.096	110.928	108.794	102.731
.25246E+08	100.237	109.136	111.979	112.792	110.687	104.709
.28402E+08	102.112	110.883	113.681	114.477	112.398	106.497
.31558E+08	103.836	112.490	115.248	116.029	113.974	108.142
.63115E+08	116.111	123.948	126.420	127.099	125.219	119.885
.94673E+08	124.016	131.337	133.633	134.252	132.486	127.474
.12623E+09	130.262	137.183	139.343	139.918	138.242	133.482
.15779E+09	135.667	142.247	144.293	144.832	143.233	138.689
.18935E+09	140.220	146.515	148.466	148.975	147.441	143.081
.22090E+09	143.990	150.045	151.917	152.401	150.922	146.718
.25246E+09	147.340	153.182	154.983	155.446	154.017	149.951
.28402E+09	149.865	155.533	157.277	157.723	156.335	152.383
.31558E+09	151.956	157.472	159.167	159.598	158.246	154.394
.63115E+09	167.063	171.453	172.789	173.120	172.033	168.935
.94673E+09	176.865	180.527	181.636	181.905	180.994	178.392
.12623E+10	180.945	184.152	185.121	185.355	184.554	182.270
.15779E+10	182.604	185.489	186.362	186.571	185.849	183.791
.18935E+10	183.132	185.777	186.578	186.770	186.106	184.219
.22090E+10	182.906	185.369	186.115	186.294	185.675	183.917
.25246E+10	181.941	184.269	184.976	185.145	184.560	182.899
.28402E+10	180.989	183.208	183.883	184.045	183.486	181.903
.31558E+10	180.058	182.190	182.840	182.996	182.459	180.937
.63115E+10	174.910	176.706	177.257	177.391	176.937	175.657
.94673E+10	170.380	172.136	172.677	172.810	172.366	171.117
.12623E+11	167.986	169.721	170.258	170.390	169.950	168.718
.15779E+11	166.434	168.151	168.683	168.814	168.379	167.161
.18935E+11	164.627	166.334	166.864	166.995	166.563	165.352
.22090E+11	162.471	164.177	164.708	164.839	164.407	163.199
.25246E+11	160.109	161.818	162.351	162.484	162.051	160.842
.28402E+11	157.826	159.539	160.075	160.209	159.775	158.564
.31558E+11	155.752	157.470	158.008	158.144	157.709	156.496

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:53 OCT 28, 1995 CP= 35941.990
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1066 TEMP sb1iose	1529 TEMP ib1iose	1608 TEMP ib1iose	2682 TEMP ob1iose
.10000E-05	66.3755	47.6725	47.5107	32.8416
.20000E-05	66.3759	47.6764	47.5145	32.8431
31.558	66.3751	47.6759	47.5141	32.8430
.31558E+07	80.4169	64.3824	64.2217	51.5615
.63116E+07	86.8638	71.8964	71.7363	59.8809

.94673E+07	91.3752	77.0979	76.9382	65.6057
.12623E+08	94.9231	81.1622	81.0028	70.0635
.15779E+08	97.8694	84.5217	84.3626	73.7388
.18935E+08	100.400	87.3971	87.2382	76.8783
.22090E+08	102.629	89.9228	89.7641	79.6312
.25246E+08	104.608	92.1592	92.0008	82.0657
.28402E+08	106.396	94.1762	94.0182	84.2587
.31558E+08	108.042	96.0297	95.8722	86.2721
.63115E+08	119.788	109.191	109.039	100.519
.94673E+08	127.380	117.637	117.488	109.635
.12623E+09	133.391	124.293	124.147	116.798
.15779E+09	138.600	130.036	129.894	122.963
.18935E+09	142.994	134.869	134.730	128.144
.22090E+09	146.633	138.870	138.734	132.435
.25246E+09	149.867	142.423	142.290	136.242
.28402E+09	152.301	145.112	144.981	139.137
.31558E+09	154.314	147.345	147.216	141.548
.63115E+09	168.866	163.462	163.352	158.942
.94673E+09	178.332	173.894	173.798	170.170
.12623E+10	182.216	178.356	178.270	175.118
.15779E+10	183.742	180.281	180.203	177.379
.18935E+10	184.174	181.005	180.934	178.354
.22090E+10	183.876	180.926	180.860	178.463
.25246E+10	182.859	180.071	180.008	177.746
.28402E+10	181.865	179.205	179.145	176.991
.31558E+10	180.902	178.343	178.286	176.217
.63115E+10	175.628	173.461	173.415	171.676
.94673E+10	171.089	168.959	168.915	167.212
.12623E+11	168.691	166.579	166.536	164.852
.15779E+11	167.134	165.040	164.997	163.331
.18935E+11	165.326	163.238	163.196	161.538
.22090E+11	163.173	161.082	161.040	159.382
.25246E+11	160.816	158.713	158.672	157.009
.28402E+11	158.538	156.423	156.382	154.713
.31558E+11	156.470	154.343	154.303	152.628

 * Can. Inner Surface Temperature Prof. in Quad 4 WP Top - Bot *

VARIABLE 2 IS AT NODE 9867 ITEM= TEMP COMP= NAME= ot4oise

*** WARNING *** CP= 35942.200 TIME= 10:43:54
 NSOL command erases all previously stored or calculated data
 unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 9830 ITEM= TEMP COMP= NAME= ot4iise

VARIABLE 4 IS AT NODE 9558 ITEM= TEMP COMP= NAME= it4oise

VARIABLE 5 IS AT NODE 9521 ITEM= TEMP COMP= NAME= it4iise

VARIABLE 6 IS AT NODE 8545 ITEM= TEMP COMP= NAME= st4oise

VARIABLE 7 IS AT NODE 8511 ITEM= TEMP COMP= NAME= st4iise

VARIABLE 8 IS AT NODE 8470 ITEM= TEMP COMP= NAME= ht4iise

VARIABLE 9 IS AT NODE 8471 ITEM= TEMP COMP= NAME= gt4iise

VARIABLE 10 IS AT NODE 7947 ITEM= TEMP COMP= NAME= c04iise

VARIABLE 11 IS AT NODE 7952 ITEM= TEMP COMP= NAME= gb4iise

VARIABLE 12 IS AT NODE 7953 ITEM= TEMP COMP= NAME= gb4hise

VARIABLE 13 IS AT NODE 7951 ITEM= TEMP COMP= NAME= sb4iise

VARIABLE 14 IS AT NODE 7996 ITEM= TEMP COMP= NAME= sb4oise

VARIABLE 15 IS AT NODE 8946 ITEM= TEMP COMP= NAME= ib4iise

VARIABLE 16 IS AT NODE 8983 ITEM= TEMP COMP= NAME= ib4oise

VARIABLE 17 IS AT NODE 9867 ITEM= TEMP COMP= NAME= ob4oise

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	9867 TEMP	ot4oise	30.51	.1000E-05	178.1	.2209E+10
3	NSOL	9830 TEMP	ot4iise	30.54	.1000E-05	178.1	.2209E+10
4	NSOL	9558 TEMP	it4oise	45.25	.1000E-05	181.6	.1893E+10
5	NSOL	9521 TEMP	it4iise	45.29	.1000E-05	181.6	.1893E+10
6	NSOL	8545 TEMP	st4oise	50.69	.1000E-05	182.7	.1893E+10
7	NSOL	8511 TEMP	st4iise	51.09	.1000E-05	182.8	.1893E+10
8	NSOL	8470 TEMP	ht4iise	86.17	31.56	192.0	.1578E+10
9	NSOL	8471 TEMP	gt4iise	99.99	31.56	196.5	.1578E+10
10	NSOL	7947 TEMP	c04iise	106.7	31.56	198.7	.1262E+10
11	NSOL	7952 TEMP	gb4iise	107.7	31.56	198.9	.1262E+10
12	NSOL	7953 TEMP	gb4hise	101.1	31.56	196.4	.1578E+10
13	NSOL	7951 TEMP	sb4iise	85.15	31.56	191.2	.1578E+10
14	NSOL	7996 TEMP	sb4oise	84.62	31.56	190.9	.1578E+10
15	NSOL	8946 TEMP	ib4iise	54.04	.1000E-05	183.7	.1893E+10
16	NSOL	8983 TEMP	ib4oise	53.46	.1000E-05	183.4	.1893E+10
17	NSOL	9867 TEMP	ob4oise	30.51	.1000E-05	178.1	.2209E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:57 OCT 28, 1995 CP= 35945.330
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9867 TEMP ot4oise	9830 TEMP ot4iise	9558 TEMP it4oise	9521 TEMP it4iise	8545 TEMP st4oise	8511 TEMP st4iise
.10000E-05	30.5127	30.5350	45.2507	45.2886	50.6946	51.0893
.20000E-05	30.5138	30.5361	45.2541	45.2920	50.6977	51.0925
31.558	30.5137	30.5360	45.2538	45.2917	50.6973	51.0920
.31558E+07	49.5259	49.5450	62.9519	62.9876	67.5736	67.9579
.63116E+07	57.9656	57.9834	70.8372	70.8719	75.1547	75.5353
.94673E+07	63.7695	63.7865	76.2717	76.3058	80.3984	80.7765
.12623E+08	68.2872	68.3036	80.5057	80.5393	84.4913	84.8674
.15779E+08	72.0108	72.0266	83.9977	84.0309	87.8718	88.2461
.18935E+08	75.1908	75.2062	86.9812	87.0141	90.7636	91.1363
.22090E+08	77.9787	77.9938	89.5978	89.6304	93.3017	93.6731
.25246E+08	80.4439	80.4586	91.9117	91.9440	95.5474	95.9172
.28402E+08	82.6641	82.6786	93.9960	94.0280	97.5706	97.9390
.31558E+08	84.7024	84.7165	95.9078	95.9396	99.4283	99.7954
.63115E+08	99.1163	99.1287	109.411	109.441	112.574	112.930
.94673E+08	108.341	108.352	118.032	118.060	120.978	121.326
.12623E+09	115.587	115.597	124.802	124.830	127.585	127.926
.15779E+09	121.820	121.830	130.628	130.654	133.277	133.611
.18935E+09	127.059	127.068	135.520	135.546	138.058	138.385
.22090E+09	131.396	131.405	139.563	139.588	142.007	142.328
.25246E+09	135.245	135.254	143.149	143.173	145.510	145.825
.28402E+09	138.173	138.181	145.857	145.881	148.149	148.459
.31558E+09	140.613	140.621	148.103	148.126	150.335	150.640
.63115E+09	158.216	158.222	164.249	164.268	166.042	166.307
.94673E+09	169.573	169.578	174.646	174.663	176.154	176.387
.12623E+10	174.599	174.604	179.048	179.062	180.369	180.578
.15779E+10	176.915	176.919	180.914	180.927	182.102	182.291
.18935E+10	177.931	177.934	181.588	181.600	182.675	182.848
.22090E+10	178.070	178.073	181.465	181.476	182.476	182.637

.25246E+10	177.376	177.379	180.572	180.583	181.525	181.676
.28402E+10	176.638	176.641	179.676	179.686	180.583	180.726
.31558E+10	175.878	175.881	178.789	178.799	179.659	179.795
.63115E+10	171.392	171.395	173.809	173.817	174.534	174.646
.94673E+10	166.935	166.937	169.276	169.284	169.980	170.086
.12623E+11	164.578	164.580	166.881	166.888	167.574	167.677
.15779E+11	163.060	163.062	165.331	165.338	166.015	166.116
.18935E+11	161.268	161.270	163.519	163.526	164.197	164.296
.22090E+11	159.113	159.115	161.352	161.359	162.027	162.125
.25246E+11	156.739	156.741	158.972	158.979	159.647	159.743
.28402E+11	154.442	154.444	156.672	156.679	157.346	157.441
.31558E+11	152.356	152.358	154.582	154.589	155.256	155.351

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:43:57 OCT 28, 1995 CP= 35945.340
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8470 TEMP ht4iise	8471 TEMP gt4iise	7947 TEMP c04iise	7952 TEMP gb4iise	7953 TEMP gb4hise	7951 TEMP sb4iise
.10000E-05	86.1725	99.9920	106.671	107.690	101.058	85.1537
.20000E-05	86.1718	99.9892	106.667	107.686	101.055	85.1536
.31558E-05	86.1709	99.9884	106.666	107.685	101.054	85.1525
.63116E+07	99.8167	112.637	118.821	119.668	113.374	98.5261
.63116E+07	106.028	118.416	124.386	125.165	119.025	104.647
.94673E+07	110.355	122.450	128.276	129.010	122.980	108.926
.12623E+08	113.744	125.613	131.328	132.029	126.086	112.285
.15779E+08	116.552	128.234	133.858	134.533	128.662	115.072
.18935E+08	118.957	130.480	136.026	136.680	130.872	117.462
.22090E+08	121.071	132.455	137.934	138.568	132.816	119.565
.25246E+08	122.943	134.204	139.622	140.241	134.539	121.429
.28402E+08	124.632	135.781	141.146	141.750	136.094	123.112
.31558E+08	126.184	137.230	142.545	143.137	137.523	124.659
.63115E+08	137.174	147.481	152.439	152.946	147.643	135.629
.94673E+08	144.191	154.007	158.731	159.188	154.102	142.659
.12623E+09	149.705	159.128	163.664	164.084	159.176	148.193
.15779E+09	154.463	163.545	167.917	168.307	163.557	152.977
.18935E+09	158.452	167.237	171.468	171.834	167.223	156.991
.22090E+09	161.726	170.256	174.364	174.711	170.222	160.292
.25246E+09	164.623	172.919	176.917	177.247	172.870	163.214
.28402E+09	166.758	174.858	178.761	179.078	174.797	165.372
.31558E+09	168.496	176.419	180.238	180.544	176.350	167.132
.63115E+09	180.808	187.360	190.525	190.756	187.250	179.641
.94673E+09	188.641	194.245	196.957	197.144	194.125	187.627
.12623E+10	191.368	196.336	198.745	198.908	196.222	190.466
.15779E+10	192.023	196.523	198.707	198.854	196.417	191.205
.18935E+10	191.780	195.921	197.934	198.069	195.823	191.026
.22090E+10	190.954	194.818	196.696	196.823	194.727	190.250
.25246E+10	189.527	193.179	194.955	195.077	193.094	188.862
.28402E+10	188.203	191.684	193.378	193.495	191.605	187.570
.31558E+10	186.974	190.317	191.945	192.059	190.243	186.366
.63115E+10	180.656	183.459	184.826	184.926	183.403	180.148
.94673E+10	175.926	178.647	179.974	180.074	178.599	175.437
.12623E+11	173.430	176.108	177.415	177.515	176.065	172.950
.15779E+11	171.797	174.440	175.730	175.830	174.399	171.325
.18935E+11	169.932	172.552	173.831	173.932	172.515	169.466
.22090E+11	167.738	170.345	171.618	171.720	170.310	167.275
.25246E+11	165.349	167.950	169.220	169.323	167.919	164.890
.28402E+11	163.045	165.642	166.910	167.016	165.614	162.589
.31558E+11	160.952	163.546	164.813	164.919	163.522	160.499

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****

38303 VERSION=HP 9000/7XX 10:43:57 OCT 28, 1995 CP= 35945.350
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7996 TEMP	8946 TEMP	8983 TEMP	9867 TEMP
	sb4oise	ib4iise	ib4oise	ob4oise
.10000E-05	84.6222	54.0357	53.4556	30.5127
.20000E-05	84.6221	54.0410	53.4607	30.5138
31.558	84.6211	54.0404	53.4602	30.5137
.31558E+07	97.9928	70.7112	70.1214	49.5259
.63116E+07	104.114	78.1974	77.6039	57.9656
.94673E+07	108.394	83.3757	82.7797	63.7695
.12623E+08	111.754	87.4183	86.8208	68.2872
.15779E+08	114.541	90.7577	90.1590	72.0108
.18935E+08	116.932	93.6138	93.0143	75.1908
.22090E+08	119.036	96.1195	95.5208	77.9787
.25246E+08	120.900	98.3363	97.7385	80.4439
.28402E+08	122.584	100.334	99.7374	82.6641
.31558E+08	124.132	102.168	101.572	84.7024
.63115E+08	135.109	115.110	114.522	99.1163
.94673E+08	142.147	123.383	122.804	108.341
.12623E+09	147.689	129.885	129.316	115.587
.15779E+09	152.479	135.489	134.929	121.820
.18935E+09	156.500	140.195	139.644	127.059
.22090E+09	159.807	144.080	143.538	131.396
.25246E+09	162.735	147.525	146.992	135.245
.28402E+09	164.900	150.116	149.591	138.173
.31558E+09	166.666	152.257	151.740	140.613
.63115E+09	179.232	167.621	167.173	158.216
.94673E+09	187.265	177.500	177.104	169.573
.12623E+10	190.142	181.558	181.204	174.599
.15779E+10	190.911	183.174	182.853	176.915
.18935E+10	190.756	183.658	183.363	177.931
.22090E+10	189.999	183.388	183.115	178.070
.25246E+10	188.627	182.384	182.127	177.376
.28402E+10	187.347	181.397	181.154	176.638
.31558E+10	186.153	180.439	180.207	175.878
.63115E+10	179.975	175.178	174.990	171.392
.94673E+10	175.272	170.601	170.422	166.935
.12623E+11	172.790	168.182	168.008	164.578
.15779E+11	171.168	166.614	166.444	163.060
.18935E+11	169.312	164.790	164.622	161.268
.22090E+11	167.124	162.615	162.450	159.113
.25246E+11	164.741	160.232	160.069	156.739
.28402E+11	162.442	157.928	157.767	154.442
.31558E+11	160.354	155.837	155.677	152.356

* Can. Outer Surface Temperature Prof. in Quad 4 WP Top - Bot *

VARIABLE 2 IS AT NODE 9786 ITEM= TEMP COMP= NAME= ot4oose

*** WARNING *** CP= 35945.560 TIME= 10:43:57
NSOL command erases all previously stored or calculated data
unless STORE,MERGE is used.

VARIABLE 3 IS AT NODE 9777 ITEM= TEMP COMP= NAME= ot4ioise

VARIABLE 4 IS AT NODE 9477 ITEM= TEMP COMP= NAME= it4oose

VARIABLE 5 IS AT NODE 9318 ITEM= TEMP COMP= NAME= it4ioise

VARIABLE 6 IS AT NODE 8540 ITEM= TEMP COMP= NAME= st4oose

VARIABLE 7 IS AT NODE 8497 ITEM= TEMP COMP= NAME= st4iose
 VARIABLE 8 IS AT NODE 8460 ITEM= TEMP COMP= NAME= ht4iose
 VARIABLE 9 IS AT NODE 8461 ITEM= TEMP COMP= NAME= gt4iose
 VARIABLE 10 IS AT NODE 7927 ITEM= TEMP COMP= NAME= c04iose
 VARIABLE 11 IS AT NODE 7929 ITEM= TEMP COMP= NAME= gb4iose
 VARIABLE 12 IS AT NODE 7930 ITEM= TEMP COMP= NAME= gb4hose
 VARIABLE 13 IS AT NODE 7928 ITEM= TEMP COMP= NAME= sb4iose
 VARIABLE 14 IS AT NODE 7991 ITEM= TEMP COMP= NAME= sb4oose
 VARIABLE 15 IS AT NODE 8787 ITEM= TEMP COMP= NAME= ib4iose
 VARIABLE 16 IS AT NODE 8902 ITEM= TEMP COMP= NAME= ib4oose
 VARIABLE 17 IS AT NODE 9786 ITEM= TEMP COMP= NAME= ob4oose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES

VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	9786 TEMP	ot4oose	32.87	.1000E-05	178.5	.2209E+10
3	NSOL	9777 TEMP	ot4iose	32.94	.1000E-05	178.5	.2209E+10
4	NSOL	9477 TEMP	it4oose	34.16	.1000E-05	178.8	.2209E+10
5	NSOL	9318 TEMP	it4iose	34.12	.1000E-05	178.8	.2209E+10
6	NSOL	8540 TEMP	st4oose	39.80	.1000E-05	179.5	.2209E+10
7	NSOL	8497 TEMP	st4iose	39.82	.1000E-05	179.5	.2209E+10
8	NSOL	8460 TEMP	ht4iose	59.70	.1000E-05	183.1	.1893E+10
9	NSOL	8461 TEMP	gt4iose	71.70	31.56	185.8	.1893E+10
10	NSOL	7927 TEMP	c04iose	75.67	31.56	186.6	.1893E+10
11	NSOL	7929 TEMP	gb4iose	76.95	31.56	186.8	.1893E+10
12	NSOL	7930 TEMP	gb4hose	74.26	31.56	186.1	.1893E+10
13	NSOL	7928 TEMP	sb4iose	66.53	31.56	184.2	.1893E+10
14	NSOL	7991 TEMP	sb4oose	66.42	31.56	184.2	.1893E+10
15	NSOL	8787 TEMP	ib4iose	47.74	.1000E-05	181.0	.1893E+10
16	NSOL	8902 TEMP	ib4oose	47.57	.1000E-05	180.9	.1893E+10
17	NSOL	9786 TEMP	ob4oose	32.87	.1000E-05	178.5	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:44:00 OCT 28, 1995 CP= 35948.690
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	9786 TEMP ot4oose	9777 TEMP ot4iose	9477 TEMP it4oose	9318 TEMP it4iose	8540 TEMP st4oose	8497 TEMP st4iose
.10000E-05	32.8670	32.9366	34.1556	34.1233	39.7981	39.8236
.20000E-05	32.8684	32.9381	34.1573	34.1250	39.8003	39.8258
31.558	32.8683	32.9380	34.1572	34.1249	39.8000	39.8255
.31558E+07	51.5830	51.6468	52.7573	52.7293	57.4245	57.4453
.63116E+07	59.9008	59.9622	61.0275	61.0014	65.3236	65.3425
.94673E+07	65.6246	65.6845	66.7197	66.6949	70.7791	70.7967
.12623E+08	70.0817	70.1403	71.1527	71.1289	75.0376	75.0543
.15779E+08	73.7564	73.8140	74.8078	74.7848	78.5550	78.5709
.18935E+08	76.8954	76.9521	77.9302	77.9080	81.5639	81.5791
.22090E+08	79.6479	79.7039	80.6684	80.6467	84.2054	84.2200
.25246E+08	82.0820	82.1374	83.0899	83.0687	86.5436	86.5578
.28402E+08	84.2747	84.3295	85.2712	85.2506	88.6516	88.6653

.31558E+08	86.2878	86.3421	87.2739	87.2538	90.5883	90.6017
.63115E+08	100.533	100.584	101.446	101.429	104.324	104.335
.94673E+08	109.647	109.695	110.507	110.492	113.126	113.135
.12623E+09	116.809	116.855	117.627	117.613	120.055	120.063
.15779E+09	122.974	123.017	123.756	123.744	126.028	126.035
.18935E+09	128.155	128.197	128.907	128.895	131.051	131.057
.22090E+09	132.445	132.485	133.171	133.160	135.211	135.217
.25246E+09	136.252	136.291	136.956	136.946	138.906	138.911
.28402E+09	139.146	139.184	139.831	139.821	141.709	141.713
.31558E+09	141.557	141.594	142.225	142.215	144.041	144.045
.63115E+09	158.949	158.979	159.489	159.483	160.874	160.876
.94673E+09	170.176	170.202	170.632	170.627	171.757	171.758
.12623E+10	175.123	175.145	175.523	175.519	176.496	176.497
.15779E+10	177.384	177.404	177.744	177.741	178.613	178.614
.18935E+10	178.358	178.376	178.688	178.685	179.481	179.482
.22090E+10	178.466	178.484	178.773	178.770	179.510	179.510
.25246E+10	177.750	177.766	178.038	178.036	178.734	178.734
.28402E+10	176.994	177.010	177.268	177.265	177.931	177.931
.31558E+10	176.220	176.235	176.482	176.480	177.119	177.120
.63115E+10	171.679	171.691	171.896	171.894	172.433	172.434
.94673E+10	167.215	167.227	167.426	167.423	167.954	167.954
.12623E+11	164.855	164.866	165.062	165.059	165.585	165.586
.15779E+11	163.333	163.345	163.537	163.535	164.056	164.057
.18935E+11	161.540	161.552	161.742	161.740	162.260	162.261
.22090E+11	159.385	159.396	159.586	159.583	160.104	160.105
.25246E+11	157.012	157.023	157.212	157.210	157.733	157.734
.28402E+11	154.715	154.727	154.915	154.913	155.440	155.441
.31558E+11	152.630	152.641	152.830	152.827	153.357	153.359

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=WP 9000/7XX 10:44:00 OCT 28, 1995 CP= 35948.700
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	8460 TEMP ht4iose	8461 TEMP gt4iose	7927 TEMP c04iose	7929 TEMP gb4iose	7930 TEMP gb4hose	7928 TEMP sb4iose
.10000E-05	59.6986	71.7004	75.6703	76.9510	74.2628	66.5287
.20000E-05	59.6991	71.6998	75.6692	76.9498	74.2620	66.5291
31.558	59.6986	71.6991	75.6683	76.9489	74.2611	66.5283
.31558E+07	74.7296	85.4901	89.0033	90.0857	87.6194	80.5654
.63116E+07	81.5792	91.8115	95.1325	96.1348	93.7674	87.0099
.94673E+07	86.3503	96.2315	99.4251	100.376	98.0759	91.5197
.12623E+08	90.0929	99.7039	102.801	103.713	101.465	95.0662
.15779E+08	93.1956	102.586	105.605	106.486	104.281	98.0112
.18935E+08	95.8565	105.060	108.013	108.868	106.701	100.541
.22090E+08	98.1979	107.240	110.135	110.968	108.834	102.769
.25246E+08	100.273	109.173	112.018	112.832	110.727	104.746
.28402E+08	102.147	110.920	113.720	114.517	112.437	106.533
.31558E+08	103.871	112.527	115.286	116.068	114.012	108.178
.63115E+08	116.143	123.983	126.456	127.136	125.255	119.919
.94673E+08	124.047	131.370	133.667	134.288	132.521	127.506
.12623E+09	130.292	137.214	139.375	139.951	138.275	133.513
.15779E+09	135.695	142.278	144.325	144.864	143.265	138.719
.18935E+09	140.247	146.544	148.497	149.006	147.472	143.110
.22090E+09	144.016	150.073	151.946	152.431	150.952	146.745
.25246E+09	147.365	153.209	155.012	155.475	154.046	149.977
.28402E+09	149.890	155.559	157.305	157.752	156.363	152.409
.31558E+09	151.980	157.498	159.194	159.626	158.273	154.420
.63115E+09	167.082	171.474	172.812	173.143	172.056	168.955
.94673E+09	176.881	180.545	181.655	181.924	181.013	178.410
.12623E+10	180.959	184.167	185.138	185.372	184.571	182.285
.15779E+10	182.617	185.503	186.377	186.587	185.864	183.805
.18935E+10	183.144	185.790	186.592	186.784	186.120	184.231

.22090E+10	182.917	185.381	186.128	186.307	185.688	183.929
.25246E+10	181.952	184.280	184.988	185.158	184.572	182.910
.28402E+10	180.999	183.219	183.894	184.057	183.498	181.913
.31558E+10	180.067	182.201	182.851	183.008	182.470	180.947
.63115E+10	174.918	176.715	177.266	177.400	176.946	175.666
.94673E+10	170.388	172.145	172.686	172.819	172.375	171.125
.12623E+11	167.994	169.730	170.267	170.399	169.959	168.726
.15779E+11	166.442	168.159	168.691	168.823	168.388	167.169
.18935E+11	164.634	166.343	166.873	167.004	166.572	165.360
.22090E+11	162.479	164.185	164.716	164.848	164.416	163.207
.25246E+11	160.116	161.826	162.359	162.493	162.059	160.850
.28402E+11	157.833	159.548	160.084	160.218	159.784	158.572
.31558E+11	155.760	157.479	158.017	158.153	157.717	156.504

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:44:00 OCT 28, 1995 CP= 35948.710
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	7991 TEMP sb4oose	8787 TEMP ib4iose	8902 TEMP ib4oose	9786 TEMP ob4oose
.10000E-05	66.4193	47.7353	47.5735	32.8670
.20000E-05	66.4197	47.7391	47.5773	32.8684
.31558E-05	66.4189	47.7387	47.5769	32.8683
.31558E+07	80.4583	64.4393	64.2787	51.5830
.63115E+07	86.9041	71.9508	71.7908	59.9008
.94673E+07	91.4147	77.1506	76.9910	65.6246
.12623E+08	94.9620	81.2135	81.0543	70.0817
.15779E+08	97.9077	84.5720	84.4131	73.7564
.18935E+08	100.438	87.4465	87.2878	76.8954
.22090E+08	102.667	89.9714	89.8129	79.6479
.25246E+08	104.645	92.2071	92.0489	82.0820
.28402E+08	106.432	94.2235	94.0657	84.2747
.31558E+08	108.078	96.0764	95.9192	86.2878
.63115E+08	119.822	109.234	109.081	100.533
.94673E+08	127.412	117.677	117.528	109.647
.12623E+09	133.421	124.331	124.185	116.809
.15779E+09	138.630	130.072	129.930	122.974
.18935E+09	143.022	134.903	134.765	128.155
.22090E+09	146.660	138.903	138.767	132.445
.25246E+09	149.894	142.455	142.322	136.252
.28402E+09	152.327	145.143	145.012	139.146
.31558E+09	154.339	147.375	147.247	141.557
.63115E+09	168.886	163.486	163.376	158.949
.94673E+09	178.349	173.914	173.818	170.176
.12623E+10	182.231	178.374	178.288	175.123
.15779E+10	183.756	180.296	180.219	177.384
.18935E+10	184.187	181.020	180.948	178.358
.22090E+10	183.887	180.940	180.873	178.466
.25246E+10	182.871	180.084	180.021	177.750
.28402E+10	181.876	179.217	179.158	176.994
.31558E+10	180.912	178.354	178.298	176.220
.63115E+10	175.636	173.471	173.425	171.679
.94673E+10	171.097	168.969	168.924	167.215
.12623E+11	168.699	166.588	166.545	164.855
.15779E+11	167.142	165.049	165.007	163.333
.18935E+11	165.334	163.247	163.205	161.540
.22090E+11	163.181	161.091	161.049	159.385
.25246E+11	160.824	158.722	158.681	157.012
.28402E+11	158.546	156.432	156.391	154.715
.31558E+11	156.478	154.352	154.312	152.630

 * WP Outer Surface Temperature Prof. at 90 deg. WP Top - Bot *

VARIABLE 2 IS AT NODE 2874 ITEM= TEMP COMP= NAME= otwoose

*** WARNING *** CP= 35948.920 TIME= 10:44:00
 NSOL command erases all previously stored or calculated data
 unless STORE, MERGE is used.

VARIABLE 3 IS AT NODE 2610 ITEM= TEMP COMP= NAME= otwiose

VARIABLE 4 IS AT NODE 2556 ITEM= TEMP COMP= NAME= itwoose

VARIABLE 5 IS AT NODE 2504 ITEM= TEMP COMP= NAME= itwiose

VARIABLE 6 IS AT NODE 563 ITEM= TEMP COMP= NAME= stwoose

VARIABLE 7 IS AT NODE 2186 ITEM= TEMP COMP= NAME= stwiose

VARIABLE 8 IS AT NODE 2150 ITEM= TEMP COMP= NAME= htwiose

VARIABLE 9 IS AT NODE 2151 ITEM= TEMP COMP= NAME= gtwiose

VARIABLE 10 IS AT NODE 126 ITEM= TEMP COMP= NAME= c0wiose

VARIABLE 11 IS AT NODE 2085 ITEM= TEMP COMP= NAME= gbwiose

VARIABLE 12 IS AT NODE 2086 ITEM= TEMP COMP= NAME= gbwoose

VARIABLE 13 IS AT NODE 2084 ITEM= TEMP COMP= NAME= sbwiose

VARIABLE 14 IS AT NODE 660 ITEM= TEMP COMP= NAME= sbwoose

VARIABLE 15 IS AT NODE 2236 ITEM= TEMP COMP= NAME= ibwiose

VARIABLE 16 IS AT NODE 2272 ITEM= TEMP COMP= NAME= ibwoose

VARIABLE 17 IS AT NODE 2874 ITEM= TEMP COMP= NAME= obwoose

STORAGE COMPLETE FOR 40 DATA POINTS

SUMMARY OF VARIABLES STORED THIS STEP AND EXTREME VALUES							
VARI	TYPE	IDENTIFIERS	NAME	MINIMUM	AT TIME	MAXIMUM	AT TIME
2	NSOL	2874 TEMP	otwoose	33.22	.1000E-05	178.6	.2209E+10
3	NSOL	2610 TEMP	otwiose	33.52	.1000E-05	178.6	.2209E+10
4	NSOL	2556 TEMP	itwoose	33.81	.1000E-05	178.7	.2209E+10
5	NSOL	2504 TEMP	itwiose	34.06	.1000E-05	178.8	.2209E+10
6	NSOL	563 TEMP	stwoose	36.44	.1000E-05	179.2	.2209E+10
7	NSOL	2186 TEMP	stwiose	36.66	.1000E-05	179.3	.2209E+10
8	NSOL	2150 TEMP	htwiose	43.94	.1000E-05	180.7	.1893E+10
9	NSOL	2151 TEMP	gtwiose	48.09	.1000E-05	181.6	.1893E+10
10	NSOL	126 TEMP	c0wiose	50.85	.1000E-05	182.2	.1893E+10
11	NSOL	2085 TEMP	gbwiose	51.76	.1000E-05	182.3	.1893E+10
12	NSOL	2086 TEMP	gbwoose	50.28	.1000E-05	181.8	.1893E+10
13	NSOL	2084 TEMP	sbwiose	47.83	.1000E-05	181.1	.1893E+10
14	NSOL	660 TEMP	sbwoose	47.73	.1000E-05	181.1	.1893E+10
15	NSOL	2236 TEMP	ibwiose	47.57	.1000E-05	181.0	.1893E+10
16	NSOL	2272 TEMP	ibwoose	47.44	.1000E-05	181.0	.1893E+10
17	NSOL	2874 TEMP	obwoose	33.22	.1000E-05	178.6	.2209E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:44:03 OCT 28, 1995 CP= 35952.050
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2874 TEMP otwoose	2610 TEMP otwoose	2556 TEMP itwoose	2504 TEMP itwoose	563 TEMP stwoose	2186 TEMP stwoose
.10000E-05	33.2231	33.5154	33.8050	34.0552	36.4397	36.6629
.20000E-05	33.2247	33.5170	33.8067	34.0569	36.4418	36.6651
31.558	33.2246	33.5169	33.8066	34.0567	36.4416	36.6649
.31558E+07	51.9172	52.1855	52.4503	52.6782	54.7976	54.9968
.63116E+07	60.2252	60.4835	60.7380	60.9567	62.9672	63.1565
.94673E+07	65.9423	66.1940	66.4416	66.6542	68.5931	68.7758
.12623E+08	70.3941	70.6407	70.8830	71.0910	72.9755	73.1534
.15779E+08	74.0643	74.3068	74.5449	74.7491	76.5897	76.7635
.18935E+08	77.1994	77.4384	77.6729	77.8739	79.6776	79.8480
.22090E+08	79.9486	80.1845	80.4159	80.6141	82.3858	82.5533
.25246E+08	82.3797	82.6129	82.8415	83.0373	84.7810	84.9459
.28402E+08	84.5696	84.8004	85.0265	85.2201	86.9388	87.1014
.31558E+08	86.5801	86.8087	87.0326	87.2242	88.9200	89.0805
.63115E+08	100.806	101.020	101.227	101.405	102.941	103.087
.94673E+08	109.906	110.107	110.303	110.470	111.902	112.038
.12623E+09	117.056	117.248	117.434	117.593	118.945	119.074
.15779E+09	123.210	123.394	123.572	123.725	125.009	125.131
.18935E+09	128.382	128.559	128.731	128.877	130.105	130.222
.22090E+09	132.665	132.836	133.002	133.143	134.323	134.436
.25246E+09	136.465	136.631	136.792	136.929	138.067	138.175
.28402E+09	139.354	139.515	139.672	139.805	140.908	141.013
.31558E+09	141.759	141.917	142.070	142.200	143.272	143.375
.63115E+09	159.113	159.241	159.365	159.470	160.321	160.402
.94673E+09	170.314	170.422	170.527	170.616	171.324	171.392
.12623E+10	175.244	175.339	175.431	175.509	176.128	176.187
.15779E+10	177.492	177.578	177.661	177.731	178.287	178.340
.18935E+10	178.457	178.536	178.611	178.676	179.184	179.232
.22090E+10	178.559	178.632	178.702	178.761	179.233	179.279
.25246E+10	177.837	177.905	177.971	178.028	178.472	178.515
.28402E+10	177.077	177.142	177.205	177.258	177.681	177.722
.31558E+10	176.299	176.362	176.422	176.473	176.878	176.917
.63115E+10	171.744	171.796	171.846	171.888	172.227	172.259
.94673E+10	167.279	167.329	167.377	167.418	167.747	167.779
.12623E+11	164.917	164.966	165.014	165.054	165.379	165.410
.15779E+11	163.395	163.443	163.490	163.530	163.851	163.882
.18935E+11	161.601	161.649	161.695	161.735	162.053	162.084
.22090E+11	159.445	159.493	159.539	159.578	159.896	159.926
.25246E+11	157.072	157.120	157.166	157.205	157.522	157.553
.28402E+11	154.776	154.823	154.869	154.908	155.226	155.256
.31558E+11	152.690	152.738	152.783	152.822	153.140	153.171

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:44:03 OCT 28, 1995 CP= 35952.060
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2150 TEMP htwoose	2151 TEMP gtwoose	126 TEMP cwoose	2085 TEMP gbwoose	2086 TEMP gbwoose	2084 TEMP sbwoose
.10000E-05	43.9392	48.0883	50.8485	51.7650	50.2795	47.8321
.20000E-05	43.9423	48.0919	50.8526	51.7693	50.2837	47.8361
31.558	43.9419	48.0915	50.8521	51.7687	50.2832	47.8356
.31558E+07	61.4525	65.1401	67.5685	68.2895	66.8690	64.5737
.63116E+07	69.2735	72.7707	75.0638	75.7111	74.3257	72.1007
.94673E+07	74.6695	78.0412	80.2459	80.8470	79.4870	77.3106
.12623E+08	78.8770	82.1532	84.2911	84.8583	83.5192	81.3811
.15779E+08	82.3495	85.5483	87.6323	88.1730	86.8517	84.7456
.18935E+08	85.3179	88.4515	90.4903	91.0091	89.7035	87.6250
.22090E+08	87.9225	90.9995	92.9993	93.4997	92.2081	90.1541
.25246E+08	90.2269	93.2543	95.2198	95.7044	94.4256	92.3934

.28402E+08	92.3035	95.2866	97.2215	97.6921	96.4251	94.4130
.31558E+08	94.2107	97.1531	99.0601	99.5184	98.2623	96.2688
.63115E+08	107.709	110.361	112.071	112.451	111.285	109.440
.94673E+08	116.338	118.810	120.400	120.738	119.633	117.889
.12623E+09	123.126	125.459	126.957	127.264	126.209	124.545
.15779E+09	128.975	131.190	132.612	132.894	131.883	130.288
.18935E+09	133.891	136.009	137.366	137.630	136.655	135.120
.22090E+09	137.959	139.995	141.298	141.546	140.603	139.119
.25246E+09	141.570	143.532	144.788	145.023	144.109	142.670
.28402E+09	144.302	146.205	147.422	147.646	146.757	145.357
.31558E+09	146.571	148.422	149.605	149.821	148.953	147.587
.63115E+09	162.927	164.394	165.330	165.487	164.783	163.677
.94673E+09	173.488	174.710	175.488	175.612	175.019	174.086
.12623E+10	178.016	179.083	179.763	179.868	179.348	178.528
.15779E+10	179.981	180.939	181.549	181.643	181.174	180.437
.18935E+10	180.733	181.609	182.168	182.253	181.824	181.148
.22090E+10	180.673	181.487	182.007	182.086	181.687	181.059
.25246E+10	179.830	180.598	181.088	181.163	180.787	180.195
.28402E+10	178.973	179.705	180.171	180.243	179.885	179.322
.31558E+10	178.118	178.821	179.269	179.338	178.995	178.455
.63115E+10	173.265	173.853	174.228	174.288	174.002	173.552
.94673E+10	168.759	169.332	169.699	169.758	169.480	169.044
.12623E+11	166.378	166.943	167.305	167.364	167.091	166.661
.15779E+11	164.838	165.397	165.755	165.814	165.544	165.120
.18935E+11	163.034	163.590	163.945	164.005	163.737	163.317
.22090E+11	160.875	161.429	161.783	161.843	161.577	161.159
.25246E+11	158.502	159.056	159.411	159.472	159.206	158.789
.28402E+11	156.207	156.762	157.118	157.180	156.914	156.497
.31558E+11	154.123	154.679	155.035	155.098	154.833	154.416

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.0A *****
 38303 VERSION=HP 9000/7XX 10:44:03 OCT 28, 1995 CP= 35952.070
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

DHLW WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	660 TEMP sbwoose	2236 TEMP ibwiose	2272 TEMP ibwoose	2874 TEMP obwoose
.10000E-05	47.7317	47.5728	47.4363	33.2231
.20000E-05	47.7356	47.5767	47.4402	33.2247
31.558	47.7352	47.5762	47.4398	33.2246
.31558E+07	64.4733	64.3144	64.1779	51.9172
.63116E+07	72.0003	71.8417	71.7053	60.2252
.94673E+07	77.2104	77.0519	76.9156	65.9423
.12623E+08	81.2810	81.1227	80.9865	70.3941
.15779E+08	84.6456	84.4875	84.3515	74.0643
.18935E+08	87.5251	87.3672	87.2314	77.1994
.22090E+08	90.0543	89.8966	89.7609	79.9486
.25246E+08	92.2937	92.1362	92.0007	82.3797
.28402E+08	94.3135	94.1562	94.0209	84.5696
.31558E+08	96.1694	96.0124	95.8773	86.5801
.63115E+08	109.344	109.191	109.060	100.806
.94673E+08	117.795	117.647	117.519	109.906
.12623E+09	124.453	124.309	124.184	117.056
.15779E+09	130.199	130.058	129.936	123.210
.18935E+09	135.032	134.894	134.775	128.382
.22090E+09	139.033	138.898	138.782	132.665
.25246E+09	142.586	142.454	142.340	136.465
.28402E+09	145.274	145.144	145.032	139.354
.31558E+09	147.506	147.378	147.268	141.759
.63115E+09	163.608	163.499	163.405	159.113
.94673E+09	174.026	173.930	173.848	170.314
.12623E+10	178.474	178.390	178.316	175.244
.15779E+10	180.388	180.311	180.245	177.492
.18935E+10	181.104	181.033	180.972	178.457

.22090E+10	181.017	180.952	180.895	178.559
.25246E+10	180.156	180.094	180.041	177.837
.28402E+10	179.285	179.227	179.176	177.077
.31558E+10	178.419	178.363	178.315	176.299
.63115E+10	173.523	173.477	173.437	171.744
.94673E+10	169.016	168.972	168.935	167.279
.12623E+11	166.634	166.591	166.555	164.917
.15779E+11	165.094	165.052	165.016	163.395
.18935E+11	163.291	163.249	163.214	161.601
.22090E+11	161.133	161.092	161.057	159.445
.25246E+11	158.763	158.723	158.688	157.072
.28402E+11	156.472	156.432	156.397	154.776
.31558E+11	154.391	154.351	154.317	152.690

***** ROUTINE COMPLETED ***** CP = 35952.080

End of batch input file

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= pugls2x.db
FOR POSSIBLE RESUME FROM THIS POINT

PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= pugls2x.db
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 112
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0

```

*** PAGE FILE USED ***
NUMBER OF R/W OPERATIONS=      30529
MAXIMUM RECORD NUMBER   =       427
RECORD SIZE (I*4 WORDS) =     16384
PAGE FILE SIZE (MB)     =     26.688

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*-----*
                ANSYS RUN COMPLETED
*-----*

                REV. 5.0 A                                HP 9000/7XX

CP TIME      (sec) =      35976.710                TIME = 10:44:54
ELAPSED TIME (sec) =      64393.000                DATE  = 10/28/95

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