

CRWMS/M&O

Non-Q Design Analysis Cover Sheet

Complete only applicable items.

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QA:

N/A *X*

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HW 1/3/97

2. DESIGN ANALYSIS TITLE			
Thermal Evaluation of the Use of BWR MOX SNF in the Waste Package Design (SCPB: N/A)			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
A00000000-01717-0200-00034 REV00		00	51
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
22	Total 1874 pages, see Table 9-1 (p.50) for breakdown		MGDS-WPD
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Design Analysis Revision Record

Complete only applicable items.

1.

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2. DESIGN ANALYSIS TITLE

Thermal Evaluation of the Use of BWR MOX SNF in the Waste Package Design (SCPB: N/A)

3. DOCUMENT IDENTIFIER (Including Rev. No.)

A00000000-01717-0200-00034 REV 00

4. Revision No.

5. Description of Revision

00

Issued ~~for final check~~ Approved HW 11/3/97

HW 11/3/97

HW 11/3/97

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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 40 BWR and 24 BWR Multi-Purpose Canister (MPC) Waste Package (WP) design to show that the design is feasible for use in the MGDS environment when loaded with BWR MOX SNF.
- 2) Characterize the conceptual 44 BWR and 24 BWR Uncanistered Fuel (UCF) Waste Package (WP) design to show that the design is feasible for use in the MGDS environment when loaded with BWR MOX SNF

The purpose of this analysis is to respond to a concern that the long-term disposal thermal issues for the WP Design, if used with SNF designed for a MOX fuel cycle, do not preclude WP compatibility with the MGDS. The objective of this analysis is to provide thermal parameter information for the conceptual WP design with disposal container which is loaded with BWR MOX SNF under nominal MGDS repository conditions. The results are intended to show that the design 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, and to show that the BWR MOX SNF loaded WP performance is similar to an WP loaded with commercial BWR SNF.

2. Quality Assurance

The QA program does not apply to this analysis. The work reported in this analysis is part of the Plutonium Disposition support effort being conducted under the purview of Special Studies within the MGDS M&O System Engineering office. 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).

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) and the BWR SNF effective thermal conductivity analysis (Ref. 5.11) by using the same method for SNF thermal modeling and the results for the WP surface temperatures from the three-dimensional emplacement scale model. This method was also performed in references 5.40, 5.41, 5.44 and 5.45 for the MGDS

design basis SNF. Thus, the BWR WP internals will be modeled with the Spent Nuclear Fuel (SNF) approximated by a homogeneous material property region based upon the GE-7 BWR MOX fuel assembly data (pp. 2A-21, 2A-22, Ref. 5.12; p. 26, Ref. 5.39; and pp.3-11, Ref. 5.30) and the SNF effective thermal conductivity calculations (Ref. 5.11). Peak SNF cladding temperatures will also be determined using the Wootton-Epstein Correlation (Ref. 5.14) for comparison purposes. The calculation shall be performed as a transient analysis 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 lists the material and thermal properties of density, emissivity, thermal conductivity, and specific heat of stainless steel 316 (see Assumption 4.3.23). 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.

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

(Equation 4.1-1)

Table 4.1-3 lists the thermal properties of A 516 carbon steel (see Assumption 4.3.24). Values for thermal conductivity and thermal diffusivity of A 516 (C-Mn-Si) 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 4.1-4 lists the density and emissivity of A 516 carbon steel. The density of A 516 (C-Mn-Si) was taken from Table A.1 of a standard heat transfer text (p. 670, Ref. 5.16) and the emissivity (average for smooth oxidized iron) was taken from Table 4.3.2 of Marks' Handbook (p. 4-68, Ref. 5.17).

Tables 4.1-5 and 4.1-6 lists the material and thermal properties of density, emissivity, thermal conductivity, and specific heat of Alloy 825 (see Assumption 4.3.25). The density of Alloy 825 (Ni-Fe-Cr-Mo-Cu) provided in Table 4.1-5 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 4.1-5 was taken from the LLNL report on the Thermal Performance of a Buried Nuclear Waste Storage Container Storing a Hybrid Mix of PWR and PWR Spent Fuel Rods. (p. 15, Ref. 5.20).

Table 4.1-6 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 4.1-5.

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

Table 4.1-3. Thermal Properties of A 516 Carbon Steel (Ref. 5.15)

Temperature		Thermal Conductivity (Btu/hr·ft·°F)	Thermal Diffusivity (ft ² /hr)	Thermal Conductivity (W/m·K)	Specific Heat (J/kg·K)
°F	°C				
70	21.11	23.6	0.454	40.84	428.72
100	37.78	23.9	0.443	41.36	444.95
150	65.56	24.2	0.433	41.88	460.94
200	93.33	24.4	0.422	42.23	476.87
250	121.11	24.4	0.414	42.23	486.08
300	148.89	24.4	0.406	42.23	495.66
350	176.67	24.3	0.396	42.06	506.09
400	204.44	24.2	0.386	41.88	517.07
450	232.22	23.9	0.375	41.36	525.64
500	260.00	23.7	0.364	41.02	536.99
550	287.78	23.4	0.355	40.50	543.63
600	315.56	23.1	0.346	39.98	550.62
650	343.33	22.7	0.333	39.29	562.21
700	371.11	22.4	0.320	38.77	577.32
750	398.89	22.0	0.308	38.08	589.10
800	426.67	21.7	0.298	37.56	600.57
850	454.44	21.2	0.286	36.69	611.35
900	482.22	20.9	0.274	36.17	629.09
950	510.00	20.5	0.262	35.48	645.12
1000	537.78	20.0	0.248	34.61	665.12
1050	565.56	19.6	0.237	33.92	682.07
1100	593.33	19.2	0.228	33.23	694.52
1150	621.11	18.7	0.213	32.36	724.07
1200	648.89	18.2	0.197	31.50	761.95
1250	676.67	17.5	0.179	30.29	806.31
1300	704.44	16.7	0.155	28.90	888.60
1350	732.22	15.8	0.119	27.35	1095.04
1400	760.00	15.3	0.077	26.48	1638.78
1450	787.78	15.1	0.154	26.13	808.68
1500	815.56	15.1	0.169	26.13	736.90

Table 4.1-4. Material Properties of A 516 Carbon Steel (Refs. 5.16 and 5.17)

	Density	Emissivity
A 516 Carbon Steel	8131.0 kg/m ³	0.80

Table 4.1-5. Material Properties of Alloy 825 (Refs. 5.19 and 5.20)

	Density	Emissivity
Alloy 825	8137.9 kg/m ³	0.80

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Table 4.1-6. 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	

Table 4.1-7 lists the thermal properties of helium (see Assumption 4.3.22). 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 4.1-7. Thermal Properties of Helium (Ref. 5.16)

Temperature		Helium Density (kg/m ³) (1 atm)	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.

Table 4.1-8 lists the thermal properties of aluminum-boron alloy (see Assumption 4.3.26). Values for thermal conductivity and thermal diffusivity for aluminum-boron alloy were taken from Table 3 of a report by Properties Research Laboratory on the thermal conductivity of aluminum-boron alloy (p. 4, Ref. 5.21). The emissivity of aluminum-boron alloy is assumed to be equivalent to that of a rough plate of aluminum (see Assumption 4.3.26). The emissivity of a rough plate of aluminum at 26°C is 0.07 as reported in Table 4.3.2 of Marks' Handbook (p. 4-68, Ref. 5.17).

Table 4.1-8. Thermal Properties of Aluminum-Boron Alloy (Ref. 5.21)

Temperature		Al-B Alloy Density (kg/m ³)	Thermal Conductivity (W/m·K)	Specific Heat (J/kg·K)
K	°C			
296.15	23.0	2693.0	182.56	868.0
323.15	50.0		190.17	903.0
373.15	100.0		199.22	946.0
423.15	150.0		202.91	976.0
473.15	200.0		203.72	998.0

4.2 Criteria

The design of the engineered barrier segment (EBS) will depend on thermal analyses of the repository host rock and near-field. Criteria that relate to the thermal analysis of the EBS are derived from the applicable requirements and planning documents. Upper-level systems requirements are provided in the Repository Design Requirements Document (RDRD) (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 Controlled Design Assumptions Document (5.7) provides guidance for requirements listed in the EB-DRD which have unqualified or unconfirmed data with the requirement. 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 EB-DRD, WPIP and they are listed in this section.

The "TBD" and "TBV" and "TBR" terms identified in the available criteria in this section will not be carried to the conclusions of this analysis based on the rationale that the conclusions derived by this analysis are for conceptual or preliminary design that will not be used as input into documents supporting construction, fabrication, or procurement.

4.2.1 EB-DRD Requirements (pp. 3-8, 3-14, 3-19, 3-25, 3-47, 3-49, 3-53, 3-54, Ref. 5.5)

"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.

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]

....

- 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]"

"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 TSw3 (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)]"

"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]"

4.2.2 Controlled Design Assumption Document (pp. 6-151, 6-152, Ref. 5.7)

The Controlled Design Assumptions (CDA) Document provides the MGDS program the following guidance for waste package and repository and applies to the thermal analysis of the EBS, but were not explicitly echoed in the current revision of the EB-DRD (Ref. 5.5).

"DCWP 001 limit the fuel cladding temperature to less than 350 °C"

(CDA DCWP 001, p.6-151, ref. 5.7)

"DCWP 002 limit the temperature of the HLW glass to less than 500 °C"

(CDA DCWP 002, p. 6-152, ref. 5.7)

4.2.3 WPIP Criteria

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. 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. Activities to support the design goals related to thermal analysis are indicated in Sections 3.4, 3.5, and 5.1 of WPIP.

"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.

Table 2-1 Listing of Design Goals*

...

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

*The source of the design goals is, for the most part, the Engineering Barrier Design Requirements Document.

⁺The source of these design goals is engineering judgment."

(WPIP, p. 2-4, 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. ..."

(WPIP, p. 3-2, Ref. 5.10)

"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)."

(WPIP, p. 4-30, Ref. 5.10)

"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"

(WPIP, p. 5-1, Ref. 5.10)

4.2.4 Thermal Goals for EBS Design

Based on Assumption 4.3.1, the requirements of Section 3.7.G 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 EBS:

- Keep the rock mass temperature at 1 meter from a vertical borehole less than 200°C.
(CDA EB-DRD 3.7.G.2, p.6-64, Ref. 5.7)
- Keep the emplacement drift wall temperature less than 200°C.
(CDA EB-DRD 3.7.G.2, p.6-64, Ref. 5.7)
- Limit the TSw3 (basal vitrophyre) maximum temperature to less than 115°C.
(CDA EB-DRD 3.7.G.3, p.6-65, Ref. 5.7)
- Limit the maximum ground surface temperature change in the vicinity of the repository to less than 2°C.
(CDA EB-DRD 3.7.G.4, p.6-66, Ref. 5.7)
- Limit the emplacement drift maximum temperature for borehole emplacement to less than 100°C.
(CDA EB-DRD 3.7.G.5, p.6-67, Ref. 5.7)
- Limit the access drift wall rock maximum temperature to less than 50°C during preclosure.

(CDA EB-DRD 3.7.G.6, p.6-68, Ref. 5.7)

- Limit the CHn maximum temperature to less than 115°C.
(CDA DCSS 025, p.6-142, Ref. 5.7)
- Limit the PTn (Upper Paint Brush non-welded) maximum temperature to less than 115°C.
(CDA DCSS 031, p.6-147, Ref. 5.7)
- Limit the SNF cladding maximum temperature to less than 350°C.
(CDA DCWP 001, p.6-151, Ref. 5.7)
- Limit the high-level waste glass maximum temperature to less than 500°C.
(CDA DCWP 002, p.6-152, 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.
(Derived from p. 2-4, Ref. 5.10 and Section 3.7.1.3.E, p. 3-53, Ref. 5.5)
- Maximize the time the waste package container stays above boiling consistent with the thermal strategy developed.
(Table 3, p. 23, Ref. 5.33)

4.2.5 Thermal Goals/Criterion Addressed by This Analysis

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

- Limit the SNF cladding maximum temperature to less than 350°C.
(CDA DCWP 001, p. 6-151, 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.
(Derived from p. 2-4, Ref. 5.10 and Section 3.7.1.3.E, p. 3-53, Ref. 5.5)

4.3 Assumptions

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. 5.33). 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 EB-DRD 3.7.G.2, p.6-64, Ref. 5.7)
- Keep the emplacement drift wall temperature less than 200°C.
(CDA EB-DRD 3.7.G.2, p.6-64, Ref. 5.7)
- Limit the TSw3 (basal vitrophyre) maximum temperature to less than 115°C.
(CDA EB-DRD 3.7.G.3, p.6-65, Ref. 5.7)
- Limit the maximum ground surface temperature change in the vicinity of the repository to less than 2°C.
(CDA EB-DRD 3.7.G.4, p.6-66, Ref. 5.7)
- Limit the emplacement drift maximum temperature for borehole emplacement to less than 100°C.
(CDA EB-DRD 3.7.G.5, p.6-67, Ref. 5.7)
- Limit the access drift wall rock maximum temperature to less than 50°C during preclosure.
(CDA EB-DRD 3.7.G.6, p.6-68, Ref. 5.7)
- Limit the CHn maximum temperature to less than 115°C.
(CDA DCSS 025, p.6-142, Ref. 5.7)
- Limit the PTn (Upper Paint Brush non-welded) maximum temperature to less than 115°C.
(CDA DCSS 031, p.6-147, Ref. 5.7)
- Limit the SNF cladding maximum temperature to less than 350°C.
(CDA DCWP 001, p.6-151, Ref. 5.7)

- Limit the high-level waste glass maximum temperature to less than 500°C.
(CDA DCWP 002, p.6-152, 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.
(Derived from p. 2-4, Ref. 5.10 and Section 3.7.1.3.E, p. 3-53, Ref. 5.5)
- Maximize the time the waste package container stays above boiling consistent with the thermal strategy developed.
(Table 3, p. 23, Ref. 5.3)

- 4.3.2 The thermal loading of 100 MTU/acre and 83 MTU/acre are considered for the preliminary design. This value is consistent with the thermal loadings (80 - 100 MTU/acre) given in the CDA (Key 019, p. 6-22, Ref. 5.7). System Engineering (p. 2, Ref. 5.23) recommended thermal loadings of 25 and 83 MTU/acre be used for M&O design analysis in order to facilitate the comparison analysis results and to present a consistent design. This assumption is used in Section 7.1. 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 Reference 5.34 (Table 2.6, pages 9 and 10) determined the thermal design basis BWR MOX SNF for the MGDS waste package to have the following characteristics: 1) an age (or cooling time) of 10 years at the time of emplacement, 2) a burnup of 37,609 MWd/MTHM, and 3) assembly average initial plutonium mass loading of 5.334 kg. To complete the characterization of the BWR MOX SNF and in order to remain consistent with the analysis performed in reference 5.40 and 5.41, the following data will be used to determine the BWR MOX SNF homogenized density and specific heat. The assumption is that the use of the following values also bounds the BWR MOX SNF designs in the same fashion for commercial BWR SNF. Thus, it is assumed that a GE-7 8x8 MOX SNF assembly with a uranium mass of 0.200 MTU/assembly and an active fuel length of 150 inches will adequately represent the BWR MOX SNF as a class of waste. This data is required in order to determine the homogenized density and specific heat of the thermal design basis BWR MOX SNF. Based upon the data from pages 2A-21 and 2A-22 of reference 5.12, page 26 of reference 5.39, and page 4 of reference 5.34; 0.200 MTU/assembly and an active length of 150 inches was selected to conservatively bound the BWR assembly types given the wide variety of uranium loading configurations. This assumption is used throughout Section 7 and in Section 4.3.

- 4.3.5 The decay heat curve for the BWR MOX SNF thermal design basis is given in Table 2.10 on page 20 of reference 5.34. Use of the data from reference 5.34 is assumed to be the bounding case for this analysis. This assumption is used throughout Section 7. The data, however, is not presented in ANSYS format and has time steps which are too large for the analysis. Thus, the MATHCAD software was used to perform a curve fit of the data and to create a MATHCAD print file with the required ANSYS decay heat 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 fit representation of the data is a reasonable representation of the data presented in reference 5.34 and that the use of curve fit representation does not affect the results presented in this analysis. The basis for this assumption is engineering judgement and the curve fit deviation evaluation is presented in Attachment I. This assumption is used throughout Section 7. The MATHCAD calculation file is presented in Attachment I which echoes the data used from reference 5.34 as input. The MATHCAD print file containing the ANSYS data is presented in Attachment II. The ANSYS readable file used in this analysis is presented in Attachment III.
- 4.3.6 The material properties, i.e., effective thermal conductivities, developed for the GE-5 8x8 BWR SNF in reference 5.11 is applied to the BWR MOX SNF for this analysis. Also, the use of data from reference 5.11 requires that the heat generation be homogenous in the modeled SNF region. Heat generation in SNF regions must be applied in this fashion to use the reference 5.11 data in a consistent manner. This assumption is used throughout Section 7.
- 4.3.7 The WP with disposal container model assumes that a two dimensional finite element model of a cross section at the midsection of the waste package will be representative of the hottest portion of the waste package. Inherent in this assumption is that axial heat transfer does not significantly affect the solution. (i.e., the flow of heat in the radial direction is assumed to dominate the solution.) The basis for this assumption is that the metal thermal conductivities and heat generation distributions are such that axial heat transfer is very small or negligible. This was shown by the analysis in reference 5.13 which modeled the waste package in three dimensions. This assumption is used throughout Section 7.
- 4.3.8 For the cross section model of the waste package, an average axial power peaking factor of 1.4 is applied to the BWR MOX SNF heat generation rate. This factor has been used in previous analysis, references 40 and 41, and is assumed to bound the range of axial power peaking factors for BWR MOX SNF. The basis for this assumption is that BWR reactor cores are designed such that axial peaking larger than an average of 1.4 is typically undesirable over an entire fuel cycle. This assumption is used throughout Section 7.
- 4.3.9 The average waste package surface temperatures (time dependent), as defined in reference 5.13 for each thermal load case, will be applied as the boundary conditions for the

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

- 4.3.10 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.
- 4.3.11 The MPC conceptual design for the 40 and 24 BWR designs as presented on pages II.A.4-13, II.A.4-14, II.A.4-18, II.A.4-24, and II.A.4-25 of reference 5.8, Figures 4.2.1.2-1, 4.2.1.2-2, 4.2.2.2-1, 4.2.2.2-1, and 4.2.2.2-2 are assumed to be the representative designs which specifies the geometry and materials of construction. The basis of this assumption is that the specified reference is the only MPC design available. The UCF conceptual design for the 44 and 24 BWR as presented in the Waste Package Sketches (reference 5.46 and 5.47) is assumed to be the representative designs which specifies the geometry and materials of construction.
- 4.3.12 The MPC and UCF waste packages are assumed to be evacuated and filled 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 WP internals. This assumption is used throughout Section 7.
- 4.3.13 The gap between the MPC 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 4.3.12 for the MPC internals. However, since helium has a reasonably good thermal conductivity, assuming a vacuum will result in slightly higher internal temperatures. 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.
- 4.3.14 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 WP, however, the natural convective heat transfer will have a small or negligible contribution to the total heat transfer for horizontally emplaced WP (see reference 5.16 for a discussion on natural convection heat transfer in the WP). 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.

- 4.3.15 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.
- 4.3.16 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.
- 4.3.17 It is assumed for this analysis that the waste package with disposal container will not contain consolidated SNF rods, but will only contain intact SNF assemblies. See KEY 008 on page 6-15 of reference 5.7 for the justification of this assumption. This assumption is used throughout Section 7.
- 4.3.18 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.
- 4.3.19 Modeling the MPC container as "floating" in the disposal container such that the WP does not touch the disposal container at any point is assumed to provide conservative results for this analysis. The basis for this assumption is engineering judgement. The assumption is conservative with respect to MPC internal temperatures since the modeled geometry eliminates any conduction heat transfer and will limit the mode of heat transfer to only radiation between two surfaces. This assumption is used throughout Section 7.
- 4.3.20 Modeling the 40 and 24 BWR MPC basket as "floating" in the 40 and 24 BWR MPC container such that the SNF tubes do not touch the MPC corner guides or any other part of the MPC is assumed to provide conservative results for this analysis. The basis for this assumption is engineering judgement. This is conservative with respect to SNF temperatures since the modeled geometry will eliminate any conduction heat transfer, other than that of conduction through the helium fill gas, from the SNF basket to the MPC shell and limits the main heat transfer mode to that of radiative heat transfer. This configuration uses the manufacturing tolerances for the 40 and 24 BWR MPC container and creates a basket/shell gap. This assumption is used throughout Section 7.
- 4.3.21 The properties of helium at atmospheric pressure are assumed to be representative of the conditions which helium in the WP 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 5.36 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.

- 4.3.22 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 WP 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 WP 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.
- 4.3.23 Use of the material properties for A 516 carbon steel provided in Tables 4.1-3 and 4.1-4 is assumed to adequately represent A 516 carbon steel 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 WP 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.
- 4.3.24 Use of the material properties for Alloy 825 provided in Tables 4.1-5 and 4.1-6 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 WP 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.
- 4.3.25 Use of the material properties for aluminum-boron provided in Table 4.1-8 and Section 4.1 is assumed to adequately represent aluminum-boron for this analysis. Particularly, the use of a constant value for the density and the use of the constant value of aluminum 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 most of the anticipated temperatures the WP is expected to experience. ANSYS does not extrapolate beyond the given tabulated values, rather it uses the last value available in the table. Thus, since thermal conductivity and specific heat generally increase with increasing temperature, ANSYS will use a conservative value if the aluminum-boron material

experiences temperatures above 200°C. 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. The use of aluminum emissivity for the aluminum-boron material is assumed reasonable in the absence of data for aluminum-boron since, for the WP, the aluminum-boron material is clad in stainless steel and has only a minor edge exposed for the outer most tubes only. Finally, the emissivity for aluminum is sufficiently low at 0.07 that a lower value will have very little impact upon the solution and the results of the analysis will be conservative if the value for aluminum-boron is indeed larger. This assumption is used in Section 4.1 and throughout Section 7.

4.3.26 The use of single, homogenized SNF material density used in conjunction with assumption 4.3.6 is assumed reasonable and adequate. The basis for this assumption is engineering judgement. The value used for SNF density is $0.388242 \times 10^4 \text{ kg/m}^3$. The density value was determined using the BWR assembly mass from Table 5.1.1.2.1-1 on page 26 of reference 5.39 of 730 lbs (331.126 kg) and dividing by the BWR assembly volume which provides an average density in kg/m^3 (Density = Mass / Volume). The BWR volume was determined using the overall assembly width of 5.44 inches and the assembly length of 175.87 inches (4.467 m) from page 2A-21 of reference 5.12. The volume calculation is then simply that of the assembly width squared multiplied by the assembly length (Volume = width x width x length). The SNF density used is: Density = Mass/Volume = $0.388242 \times 10^4 \text{ kg/m}^3$. This assumption is used throughout Section 7.

4.3.27 The use of single, homogenized SNF material specific heat used in conjunction with assumption 4.3.6 is assumed reasonable and adequate. The basis for this assumption is engineering judgement. The value used for SNF specific heat is $0.273129 \times 10^3 \text{ J/kg} \cdot \text{K}$. The specific value was determined using: 1) the BWR assembly and uranium mass from Table 5.1.1.2.1-1 on page 26 of reference 5.39 of 730 lbs (331.126 kg) and 200 kg and 2) the specific heat of uranium oxide is $47 \text{ J/kg} \cdot \text{K}$ (100°C) and Zirc2 of $330.0 \text{ J/kg} \cdot \text{K}$ (400°C) from Tables 8-1 and 8-2 on page 296 of reference 5.1. The assembly is assumed to be comprised only of uranium oxide and zirc2 (i.e., the added plutonium as a negligible effect upon the final value), therefore the homogenized specific heat is a simple mass weighted average (i.e., $\text{SNF } C_p = (C_p \text{ UO}_2 \cdot \text{Mass UO}_2 + C_p \text{ Zr2} \cdot \text{Mass Zr2}) / \text{Mass of Assembly}$). The mass of UO_2 is determined from the mass of uranium (i.e., mass $\text{UO}_2 = \text{mass U} \cdot (\text{Atomic wt U} + 2 \cdot \text{Atomic wt of O}^{16}) / \text{Atomic wt of U} = 226.886 \text{ kg}$). The mass of Zirc2 is then simply the difference between the total assembly mass and the UO_2 mass (i.e., mass Zr2 = 104.24 kg). The SNF specific heat value is then calculated to be: $\text{SNF } C_p = 273.129 \text{ J/kg} \cdot \text{K}$. This assumption is used throughout Section 7.

4.4 Codes and Standards

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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- 5.41 Thermal Evaluation of the Conceptual 24 BWR MPC with ACD Disposal Container, DI Number: BBABA0000-01717-0200-00003, REV 00, CRWMS M&O.
- 5.42 MPC Disposal Container (12-PWR/24-BWR), DI: BBA000000-01717-2100-15018, R00B, CRWMS M&O.
- 5.43 Low TL/Humid MPC Disposal Container (12-PWR/24-BWR), DI: BBA000000-01717-2100-15074, R00A, CRWMS M&O.
- 5.44 Thermal Evaluation of Conceptual 44 BWR Uncanistered Fuel (UCF) Tube Basket Design Disposal Container, DI Number: BBAA00000-01717-0200-00001 REV 00, CRWM M&O.
- 5.45 Thermal Evaluation of Conceptual 24 BWR Uncanistered Fuel (UCF) Tube Basket Design Disposal Container, DI Number: BBAA00000-01717-0200-00002 REV 00, CRWM M&O.
- 5.46 Waste Package Tube Design (44-BWR), DI Number: BBA000000-01717-2100-15050 to 15056 REV 00A, CRWMS M&O.
- 5.47 Waste Package Tube Design (24-BWR), DI Number: BBAA000000-01717-2100-15029 to 15112 REV 00A, CRWMS M&O.

6. Use of Computer Software

The FEA analysis computer code used for this analysis is ANSYS Version (V) 5.1 which is identified with the Computer Software Configuration Item (CSCI) 30003 V5.1HP. 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 Software Qualification Report for ANSYS Version 5.1HP (Ref. 5.25). The ANSYS evaluations performed for this design are fully within the range of the validation performed for the ANSYS V5.1 code. Access to and use of the code for the analysis granted and performed in accordance with the ANSYS V5.1 Life Cycle Plan (p. 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 design analysis.

The ANSYS MOX 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 a simple mathematical calculations which can easily be checked by hand or through alternate calculational methods. Based upon the data provided in assumption 4.3.5, MATHCAD V5.0+ performs a simple curve fit via an iterative least squares method. Once the proper equation coefficients for the curve fit of the data is obtained, MATHCAD V5.0+ summarizes the numeric differences between the input data and the curve fit data 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. The data is provided in this analysis for the purpose of performing hand calculation checks. The data manipulation has been checked by hand, 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 fit to supply data for an ANSYS SNF heat load file. The MATHCAD V5.0+ software was executed on an IBM PC compatible.

The Wooton-Epstein correlation calculation was performed with the computer code Lotus 1-2-3 for Windows Version 1.1 and is classified as computational support software. Lotus 1-2-3 for Windows Version 1.1 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. Lotus 1-2-3 for Windows Version 1.1 simply provides a frame work to automate a simple calculation which can easily be checked by hand. The input data and a description of the calculation performed is provided in Section 7.4 for the purpose of performing hand calculation checks. The calculation has been checked by hand and will be used in this analysis on that basis. Lotus 1-2-3 for Windows Version 1.1 was utilized for the purpose of computational support software as it was intended and it is appropriate for the use of generating peak cladding temperatures as specified in Section 7.4. Lotus 1-2-3 for Windows Version 1.1 was executed on an IBM PC compatible.

The presentation graphics provided in Section 7.4 was generated with the computer code Harvard Graphics Version 2.0 and is classified as computational support software. Harvard Graphics Version 2.0 was executed on an IBM PC compatible. Harvard Graphics Version 2.0 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. Harvard Graphics Version 2.0 simply provides a frame work to create a graphical representation of data. No calculation or modification beyond cut and paste operations with tabular ANSYS or Lotus 1-2-3 output was performed in Harvard Graphics.

7. Design Analysis

7.1 Background

As part of an engineered barrier system for the containment of radionuclides, the 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 and fuel cladding 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 SNF, the Commercial Spent Fuel Management Program (p. xii, Ref. 5.27) at Pacific Northwest Laboratory recommended a 380°C temperature limit for the SNF cladding to prevent creep rupture failure. A more conservative value of 350°C has been selected (CDA DCWP 001, p. 6-165, Ref. 5.7) to account for uncertainties in source characteristics as well as heat transfer calculations. 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 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) and are discussed in Section 4.2.

The method for WP thermal evaluations involves a three-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 WP surface temperature history for use as a boundary condition. The WP boundary condition is then applied to a detailed two dimensional (2-D) WP model, it is this 2-D model which is analyzed in this report. Resulting SNF basket wall temperature predictions from the WP model provide the boundary for an estimation of peak SNF cladding temperatures. Cladding temperatures are predicted in the WP model using an effective conductivity defined to represent an homogeneous SNF assembly. The effective conductivity was determined using a detailed third model of an intact SNF assembly as presented in reference 5.11. Cladding temperatures are also conservatively estimated using an empirical correlation from reference 5.14.

The thermal environment of the WP in the repository will change with time and is affected by the heat produced in the WP. Therefore, the WP thermal evaluation must be a transient analysis that takes into account the time varying heat load of the WP. 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. 6-22, Ref. 5.7) and the WP must be shown to meet requirements over that range. Representative thermal loadings of 100 MTU/acre (24.7 kg U/m²) and 83 MTU/acre (20.5 kg U/m²) were selected (see assumption 4.3.2) for BWR MOX SNF WPs to be consistent with the CDA, 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. 5.29). The intent of this analysis is to show that the BWR MOX SNF has a very similar performance profile to commercial BWR SNF which was analyzed in references 5.40, 5.41, 5.45 and 5.46.

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

AML MTU/acre	Initial APD kW/acre	Small Waste Package Spacing	Large Waste Package Spacing	Drift Spacing
100 (high #1)	113.7	9.2 m	16.2 m	22.5 m
83 (high #2)	94.4	11.1 m	19.5 m	22.5 m

7.2 Design Basis Fuel

To capture a majority of the SNF, the WP must be designed and evaluated to accommodate the bounding or limiting case of fresh SNF which has a thermal output much higher than average. Thus, a design basis SNF can be determined which can be considered the hottest SNF that could be loaded and emplaced in that waste package. The detailed waste package/EBS evaluation would then represent the hottest waste package in a repository at a given thermal loading (with otherwise average SNF). While all of the waste packages (hot and cold) will collectively influence repository temperatures (average SNF characteristics), every waste package must meet thermal goals (design basis SNF characteristics). The methodology and selection of commercial SNF design basis SNF for WP design is covered in reference 5.28. The design basis BWR MOX SNF which will be used to compare to commercial BWR SNF is presented in reference 5.34 and assumption 4.3.5.

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 SNF is important because it could limit the number of assemblies that can be loaded in one WP without exceeding

thermal goals for disposal. The limiting thermal goal for waste packages is a temperature of no more than 350°C at the SNF cladding. Several different design basis SNF 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 commercial SNF and BWR MOX SNF types used as specified in references 5.40, 5.41, 5.44, 5.45 and 5.34.

Table 7.2-1. Thermal Analysis Commercial and MOX SNF Design Bases

Organization	SNF Type	SNF Age	SNF Burnup	Initial Heat
MGDS (ref. 5.28)	PWR	10 years	48 GWd/MTU	850 watts
MGDS (ref. 5.28)	BWR	10 years	49 GWd/MTU	409 watts
MPC (ref. 5.39)	PWR	20 years	40 GWd/MTU	547 watts
MPC (ref. 5.39)	BWR	20 years	40 GWd/MTU	265 watts
MPC Historic (ref. 5.8)	PWR	10 years	40 GWd/MTU	718 watts
BWR MOX (ref.5.34)	BWR	10 years	37.6 GWd/MTHM	256 watts

Design basis SNF 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 SNF and the basket/container 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 choice of the design basis SNF 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.

In the following evaluation, only the BWR MOX SNF defined in reference 5.34 has been used in the ANSYS analysis. Any information concerning commercial BWR SNF was obtained directly from references 5.40, 5.41, 5.44 and 5.45. The time dependence of the design basis BWR MOX SNF is provided in Appendix III as provided by MATHCAD V5.0+ using the data provided in reference 5.34. MATHCAD V5.0+ uses the data provided in assumption 4.3.5, performs a curve fit for the input decay heat data to obtain the 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, along with the MATHCAD V5.0+ print file as Attachment II, and the ANSYS readable file created from the MATHCAD V5.0+ print file as Attachment III.

7.3 2-D Waste Package Model Development

The general philosophy used to create an input file for each thermal loading case is outlined here. Since there are only two major differences between individual cases, i.e., boundary condition and internal structures, a base deck was created with the basic modeling information. The base deck was then copied for each thermal loading ANSYS case. Each individual file then had the appropriate boundary condition file from reference 5.13 entered into the input decks.

The basic layout 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 used 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 WP basket geometry parameters are reported 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 throughout 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 SNF 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. This method of building the model 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 a transient, the loads and B.C.'s are applied at each time step. 7) Finally, selected positions in the SNF, basket, MPC shell, and disposal container were selected to have temperatures for each time step of the transient echoed to the output file for examination.

Each ANSYS input deck is provided as part of the ANSYS output files in Attachments XV through XXII. Heat and material input files are provided as Attachments III, IV, V and the boundary condition files for each thermal loading case is provided in Attachments XI through XIV.

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 40 and 24 BWR MPC conceptual design, and 44 and 24 BWR UCF 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 is specified in reference 5.8 (Section 4.2.2.2) for the 40 and 24 BWR MPC conceptual design and references 5.31, 5.35, 5.37, 5.42, and 5.43 for the disposal container (see assumptions 4.3.11 and 4.3.12). The geometry and material is specified in reference 5.46 and 5.47 for 44 and 24 BWR UCF design.

Since this model is part of a larger calculational scheme as indicated in references 5.11 and 5.13, a simple 2-D cross section of the WP will be modeled (see assumption 4.3.7). A vertical plane a symmetry is easily identified and thus, the geometry modeled will be that of the right hand side of the WP with disposal container. The geometry is not modeled with quarter symmetry since the boundary condition, as specified in reference 5.13, indicates a vertical surface temperature distribution and requires half symmetry. Attachments VI (40 BWR MPC), VII (24 BWR MPC), VIII (44 BWR UCF) and IX (24 BWR UCF) provides the mesh plots of the general layout of each 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 IV (see assumption 4.3.22, 4.3.23, 4.3.24 and 4.3.25). The effective conductivity of the SNF assembly model areas were developed in reference 5.11 and are provided as Attachment V. The additional properties were developed in Section 4.3 (see assumptions 4.3.6, 4.3.26, and 4.3.27) and entered into the input deck. Attachment IV also includes material properties which were not used in this analysis (i.e., those identified as material ID's 4, 5, 6, 8, 9, 10, 11, and 12 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, 10, 11, 13, 14, 15, 16, 17, 18, 19 and 20).

- 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.

The material which carries the heat load is the SNF and is modeled as a solid material placed in the interior of each tube. The heat load is dependant upon the design basis SNF selected and is discussed in Section 7.2. Briefly, the heat loads for the SNF areas are from the data provided in reference 5.34 for design basis BWR MOX SNF. 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 1.4 to approximate the axial center of the WP with a 2-D model (see assumption 4.3.8). A SNF assembly is much hotter at the mid-length than at the ends, and it is conservative to assume the 2-D waste package model represents the hottest cross-section of the waste package.

As indicated in section 7.1, this analysis is part of a three part calculation method. As such the boundary conditions are provided by the first calculation performed in reference 5.13. The boundary conditions for each repository thermal loading scenario was applied to the waste package surface as a temperature requirement to create the ANSYS decks (see assumption 4.3.9). The boundary conditions are time dependent, the SNF heat generation rate is also time dependent, and therefore the problem is a transient. The boundary conditions and heat loads were applied and solved out to 1000 years for the 100 MTU/acre and 83 MTU/acre scenario described in Section 7.1 for the BWR MOX SNF loaded into WPs. The transient time 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 results of each ANSYS execution are provided as Attachment X. 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 2-D Waste Package Analysis Results

The results provided in this section for BWR MOX SNF were derived from the ANSYS V5.1 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. The results for commercial BWR SNF were copied directly from references 5.40, 5.41, 5.44 and 5.45.

To check the above SNF model preliminary results, the Wootton-Epstein correlation (reference 5.14) was applied for each of the cases. This empirically derived correlation was shown to be

conservative for helium fill environment in Section 3.6.2 of the BR-100 Spent Fuel Shipping Cask report (reference 5.38) and reference 5.11. The Wooton-Epstein relationship is described by Equation 7-1.

$$q'' = \sigma \frac{C_1}{\frac{1}{\epsilon_{cl}} + \frac{1}{\epsilon_{ba}} - 1} (T_{cl}^4 - T_{ba}^4) + C_2 (T_{cl} - T_{ba})^{\frac{4}{3}}$$

(Equation 7-1)

Where:

- q'' = heat flux from SNF based on the basket inner surface heat transfer area (Btu/hr·ft²)
- C_1 = constant depending on the spent fuel rod array size,
= $4N/(N+1)^2$ for odd N
= $4/(N+2)$ for even N
- C_2 = regression constant = 0.118
- N = number of fuel rods in a single row of a square spent fuel assembly
- T_{cl} = cladding surface temperature (absolute scale, °R)
- T_{ba} = basket surface temperature (absolute scale, °R)
- ϵ_{cl} = cladding surface emissivity
- ϵ_{ba} = basket surface emissivity
- σ = Stefan-Boltzmann constant (Btu/hr·ft²·°R⁴)

The relationship has two terms; one representing radiation heat transfer, and one representing gaseous convection in an array of heat producing rods. Because the cladding temperature occurs in both terms, the relation must be solved iteratively. A complete description of the correlation development is given in the Wooton-Epstein paper (reference 5.14). For this analysis, the same material properties and conditions were assumed with the Wooton-Epstein relation that were used in the ANSYS model (see assumptions 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.16, 4.3.18, and 4.3.22):

Stefan-Boltzmann constant	1.714×10^{-9} (Btu/hr·ft ² ·°R ⁴)
Cladding emissivity	0.806 (0.002 inch oxidation layer, Ref. 5.11)
Basket emissivity	0.600 (Stainless 316L); 0.800 (A 516)
Basket cell width	152.4 mm (6 inches)
SNF array size (N)	8 rods
Assembly active length	3810 mm (150 inches)
Axial peaking factor	1.4

The conservative peak cladding temperatures were calculated with the Wooton-Epstein

correlation, the above values for required parameters, and the ANSYS calculated peak basket temperatures.

Tables 7.4-1 and 7.4-2 summarize the peak cladding temperature data for the 40 BWR MPC MOX SNF case analyzed and the 40 commercial BWR MPC SNF case from reference 5.40. Both "conservative" estimates of peak cladding temperatures using the Wooton-Epstein correlation, and "best estimate" predictions using the effective conductivity method are presented in the table. Peak cladding temperatures using effective conductivity are calculated directly in the ANSYS program, and Wooton-Epstein calculations for each time step in the ANSYS analysis were also performed for comparison. The detailed temperatures for each time step is listed in Attachment X.

Tables 7.4-3 and 7.4-4 summarize the peak cladding temperature data for the 24 BWR MPC MOX SNF case analyzed and the 24 commercial BWR MPC SNF case from reference 5.41. Both "conservative" estimates of peak cladding temperatures using the Wooton-Epstein correlation, and "best estimate" predictions using the effective conductivity method are presented in the table. Peak cladding temperatures using effective conductivity are calculated directly in the ANSYS program, and Wooton-Epstein calculations for each time step in the ANSYS analysis were also performed for comparison. The detailed temperatures for each time step is listed in Attachment X.

Tables 7.4-5 and 7.4-6 summarize the peak cladding temperature data for the 44 BWR UCF MOX SNF case analyzed and the 44 commercial BWR UCF SNF case from reference 5.44. Both "conservative" estimates of peak cladding temperatures using the Wooton-Epstein correlation, and "best estimate" predictions using the effective conductivity method are presented in the table. Peak cladding temperatures using effective conductivity are calculated directly in the ANSYS program, and Wooton-Epstein calculations for each time step in the ANSYS analysis were also performed for comparison. The detailed temperatures for each time step is listed in Attachment X.

Tables 7.4-7 and 7.4-8 summarize the peak cladding temperature data for the 24 BWR UCF MOX SNF case analyzed and the 24 commercial BWR UCF SNF case from reference 5.45. Both "conservative" estimates of peak cladding temperatures using the Wooton-Epstein correlation, and "best estimate" predictions using the effective conductivity method are presented in the table. Peak cladding temperatures using effective conductivity are calculated directly in the ANSYS program, and Wooton-Epstein calculations for each time step in the ANSYS analysis were also performed for comparison. The detailed temperatures for each time step is listed in Attachment X.

The thermal history of peak SNF temperatures for the large (40 MPC / 40 UCF) and small (24 MPC / 24 UCF) WP cases are presented graphically in Figures 7.4-1 through 7.4-4 at thermal loading 100 MTU/acre and 83 MTU/acre. Notice that the MOX SNF has lower peak SNF cladding temperatures compared to commercial SNF for each of the WP designs due to the lower heat decay rate. Peak temperatures inside the waste package occur between the time of

emplacement and the time of peak drift wall temperatures. At emplacement the SNF heat load is at its highest, but the drift is still cool, and by the time of peak drift temperatures, the heat load has decayed so that internal temperature drops are lower.

Table 7.4-1. Thermal Results Comparison of 40 BWR MOX MPC and 40 Commercial BWR MPC Waste Package (Thermal Loading 100 MTU/ arce)

Time (yrs)	40 BWR MOX MPC			40 Commercial BWR MPC		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	249	241	393.1	300	287
10	213.3	260	254	310.6	294	283
30	160.0	254	249	214.5	274	265
50	130.3	245	241	157.9	255	248
100	96.34	227	223	90.4	224	219
1000	26.04	168	167	15.5	163	161

Table 7.4-2. Thermal Results Comparison of 40 BWR MOX MPC and 40 Commercial BWR MPC Waste Package (Thermal Loading 83 MTU/ arce)

Time (yrs)	40 BWR MOX MPC			40 Commercial BWR MPC		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	245	238	393.1	297	284
10	213.3	252	245	310.6	287	276
30	160.0	238	233	214.5	259	250
50	130.3	227	222	157.9	238	230
100	96.34	207	203	90.4	204	199
1000	26.04	151	149	15.5	145	143

Table 7.4-3. Thermal Results Comparison of 24 BWR MOX MPC and 24 Commercial BWR MPC Waste Package (Thermal Loading 100 MTU/ arce)

Time (yrs)	24 BWR MOX MPC			24 Commercial BWR MPC		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	218	197	393.1	262	246
10	213.3	235	219	310.6	264	251
30	160.0	236	223	214.5	252	242
50	130.3	230	220	157.9	238	231
100	96.34	216	208	90.4	214	208
1000	26.04	165	162	15.5	160	159

Table 7.4-4. Thermal Results Comparison of 24 BWR MOX MPC and 24 Commercial BWR MPC Waste Package (Thermal Loading 83 MTU/ arce)

Time (yrs)	24 BWR MOX MPC			24 Commercial BWR MPC		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	212	192	393.1	258	242
10	213.3	225	209	310.6	255	242
30	160.0	218	205	214.5	235	225
50	130.3	210	199	157.9	219	211
100	96.34	195	186	90.4	192	187
1000	26.04	147	144	15.5	142	140

Title: Thermal Evaluation of the use of BWR MOX SNF in the Waste Package Design

Document Identifier: A00000000-01717-0200-00034 REV 00

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Table 7.4-5. Thermal Results Comparison of 44 BWR MOX UCF and 44 Commercial BWR UCF Waste Package (Thermal Loading 100 MTU/ arce)

Time (yrs)	44 BWR MOX UCF			44 Commercial BWR UCF		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	229	216	393.1	279	261
10	213.3	249	239	310.6	283	269
30	160.0	247	239	214.5	267	256
50	130.3	239	233	157.9	250	241
100	96.34	222	216	90.4	220	214
1000	26.04	166	164	15.5	161	160

Table 7.4-6. Thermal Results Comparison of 44 BWR MOX UCF and 44 Commercial BWR UCF Waste Package (Thermal Loading 83 MTU/ arce)

Time (yrs)	44 BWR MOX UCF			44 Commercial BWR UCF		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	224	211	393.1	275	257
10	213.3	239	228	310.6	273	258
30	160.0	229	220	214.5	249	237
50	130.3	218	211	157.9	229	220
100	96.34	200	194	90.4	198	192
1000	26.04	148	145	15.5	143	141

Table 7.4-7. Thermal Results Comparison of 24 BWR MOX UCF and 24 Commercial BWR UCF Waste Package (Thermal Loading 100 MTU/ arce)

Time (yrs)	24 BWR MOX UCF			24 Commercial BWR UCF		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	192	177	393.1	226	202
10	213.3	221	209	310.6	242	224
30	160.0	226	218	214.5	238	225
50	130.3	222	215	157.9	228	218
100	96.34	210	204	90.4	207	200
1000	26.04	162	160	15.5	159	157

Table 7.4-8. Thermal Results Comparison of 24 BWR MOX UCF and 24 Commercial BWR UCF Waste Package (Thermal Loading 83 MTU/ arce)

Time (yrs)	24 BWR MOX UCF			24 Commercial BWR UCF		
	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)	Heat Load (W/assy)	W-E Peak Temp. (C)	Eff. Cond. Peak Temp (C)
1	250.7	185	170	393.1	219	195
10	213.3	208	196	310.6	230	211
30	160.0	206	196	214.5	218	204
50	130.3	200	192	157.9	206	195
100	96.34	187	180	90.4	184	176
1000	26.04	144	141	15.5	140	138

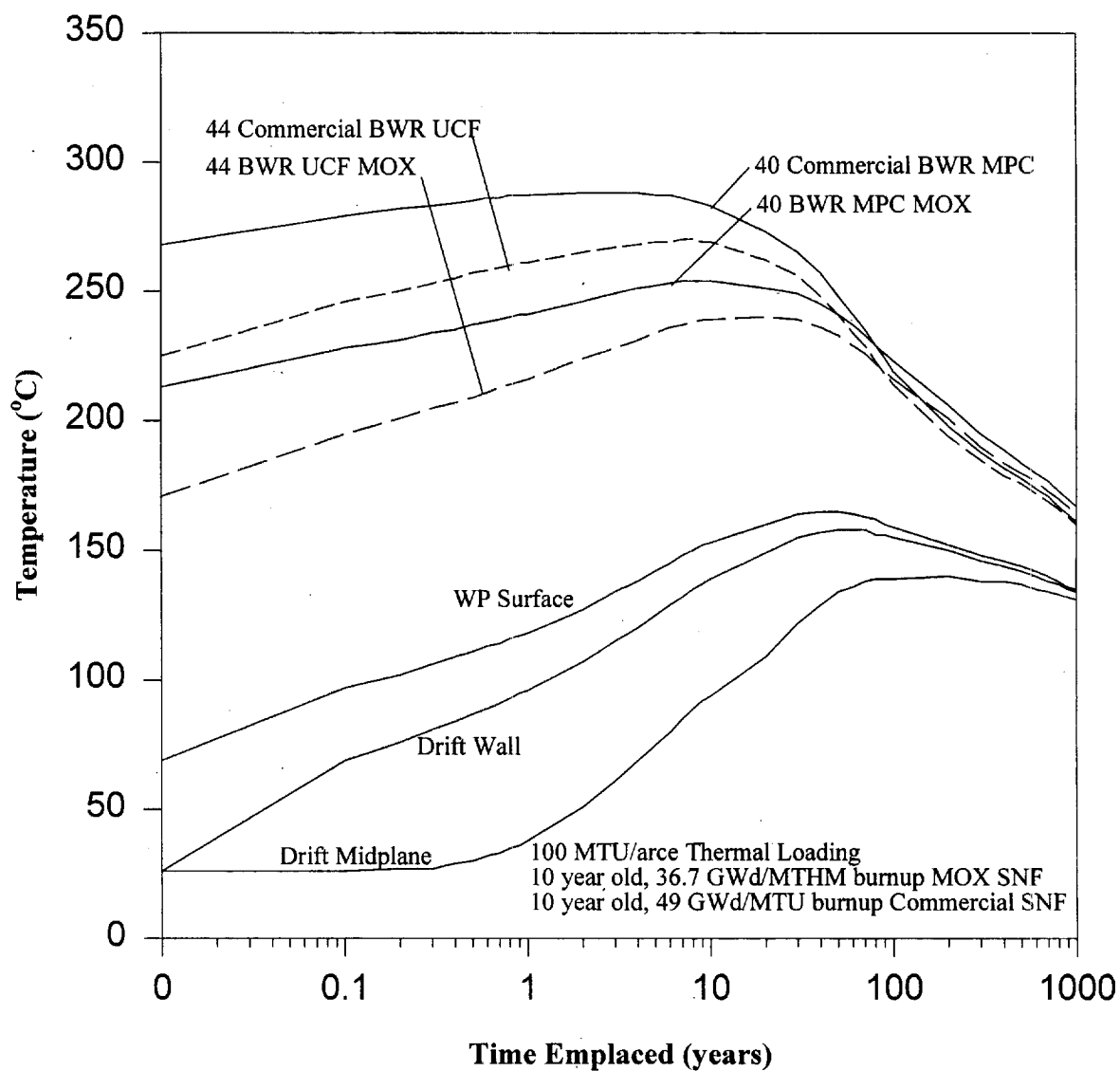


Figure 7.4-1. Summary of Peak SNF Temperatures (Effective Conductivity Method) for Large BWR WP at Thermal Loading 100 MTU/acre

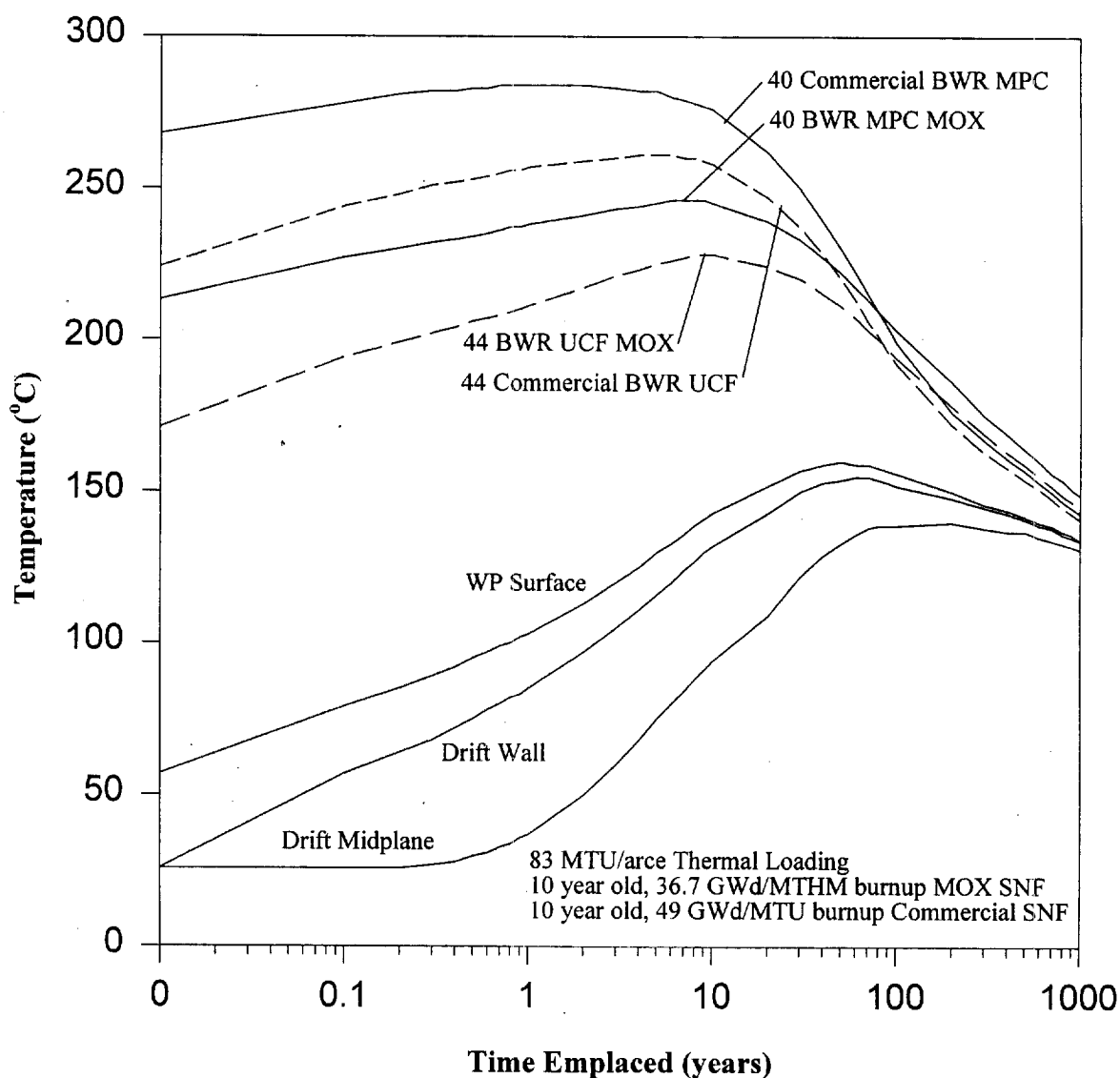


Figure 7.4-2. Summary of Peak SNF Temperatures (Effective Conductivity Method) for Large BWR WP at Thermal Loading 83 MTU/acre

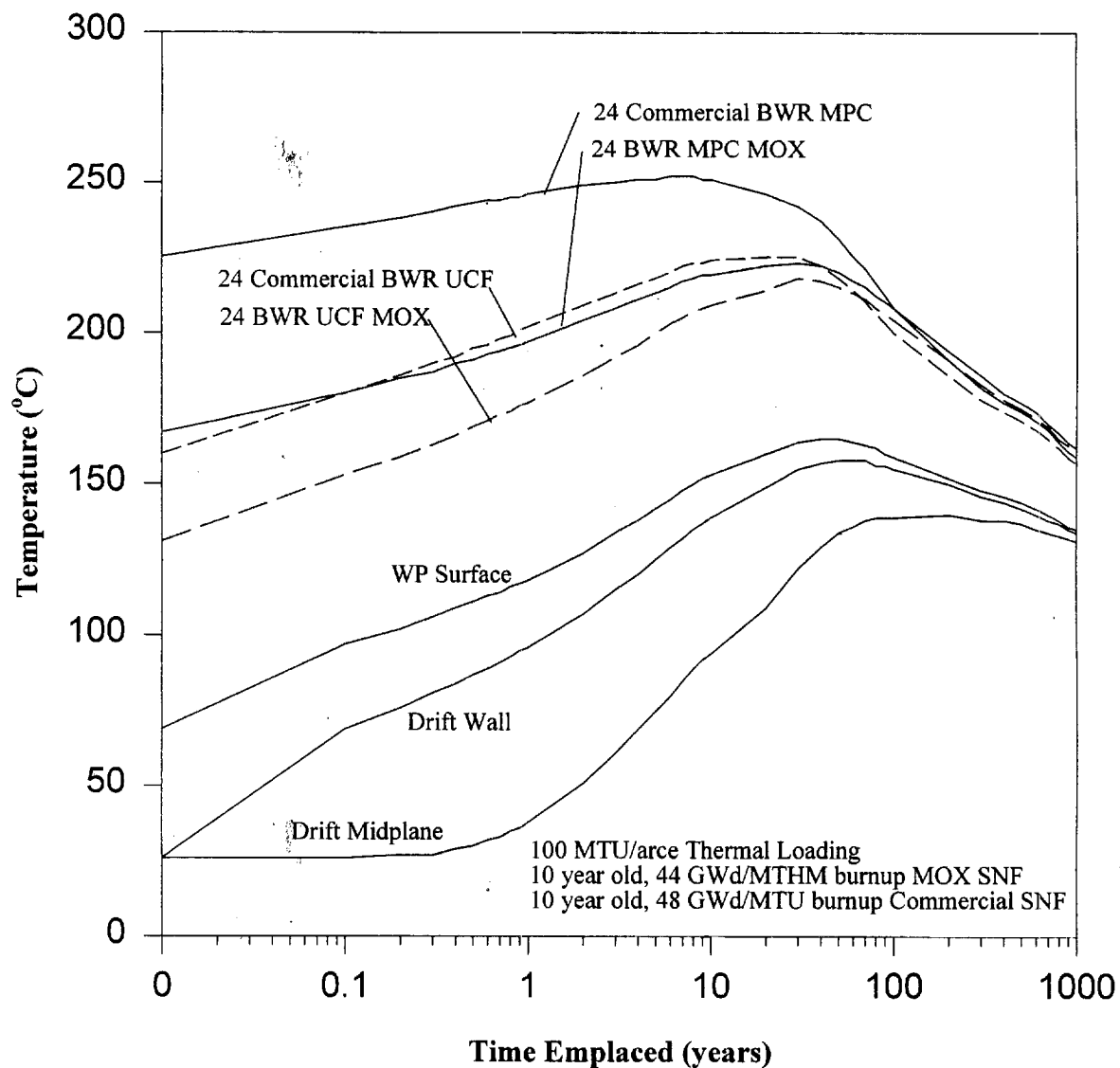


Figure 7.4-3. Summary of Peak SNF Temperatures (Effective Conductivity Method) for Small BWR WP at Thermal Loading 100 MTU/acre

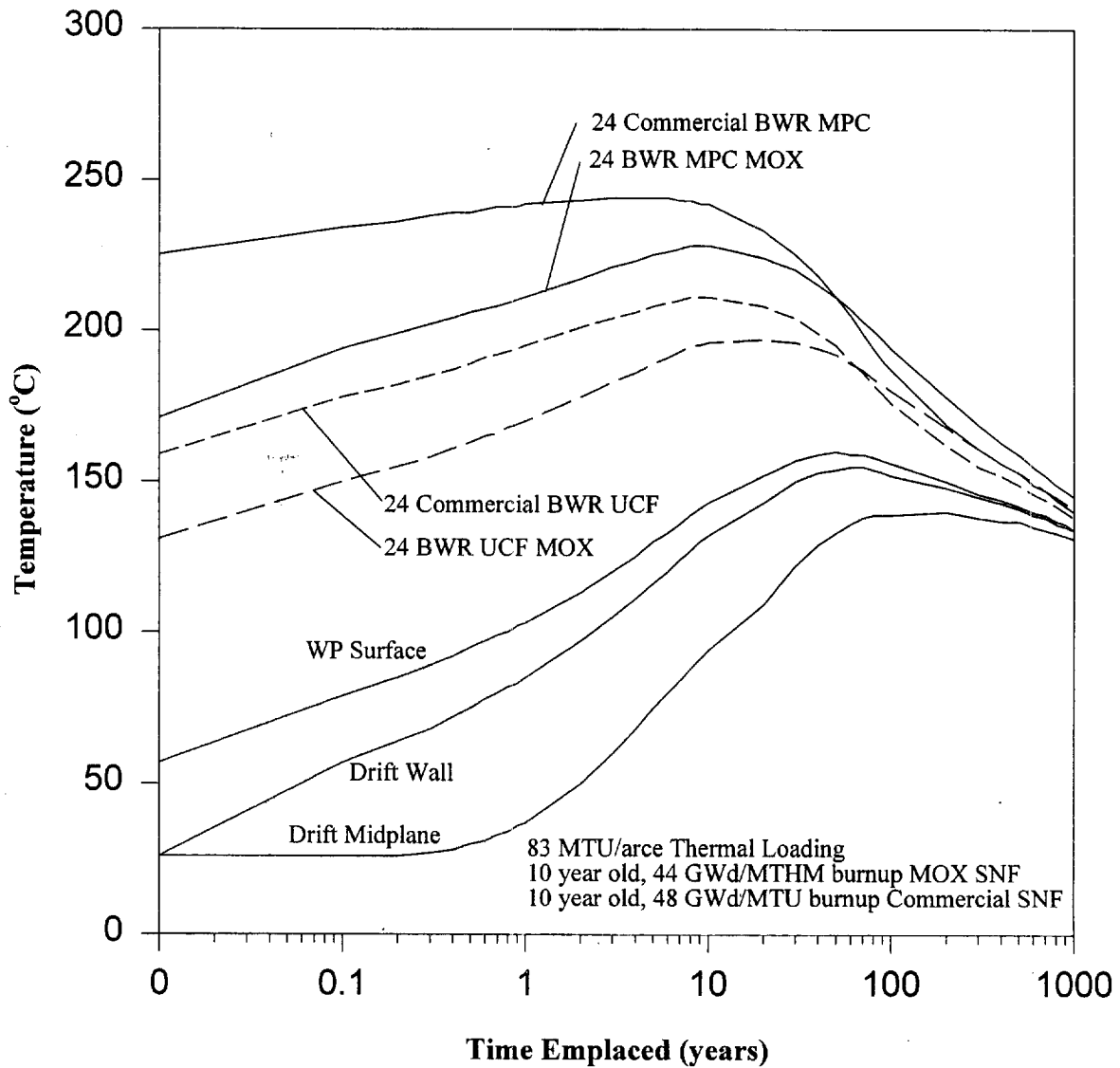


Figure 7.4-4. Summary of Peak SNF Temperatures (Effective Conductivity Method) for Small BWR WP at Thermal Loading 83 MTU/acre

8. Conclusions

Table 8-1 and 8-2 summarize the peak temperatures and the time of occurrence for each of the MOX BWR cases analyzed and commercial SNF presented from references 5.40, 5.41, 5.44 and 5.45. The thermal loading scenarios indicated in Table 8-1 and 8-2 are defined in Table 7.1-1, and the design basis SNF descriptions are provided in Table 7.2-1. Both "conservative" estimates of peak cladding temperatures using the Wooton-Epstein correlation and "best estimate" predictions using the effective conductivity method are presented in the table. Peak cladding temperatures using effective conductivity are calculated directly in the ANSYS program, and Wooton-Epstein calculations for each time step in the ANSYS analysis were also performed for comparison.

Table 8-1. BWR MOX/Commercial SNF Thermal Analysis Results Summary
(Thermal Loading: 100 MTU/arce)

WP Type	Design Basis SNF	Peak Cladding				Peak Basket		MPC shell		WP Surface	
		Cons. Est.		Best Est.							
		°C	yrs	°C	yrs	°C	yrs	°C	yrs	°C	yr
40 BWR MPC	MGDS	301	2	288	2	280	3	213	30	188	50
40 BWR MPC	MOX	261	8	254	8	246	9	210	30	188	50
24 BWR MPC	MGDS	265	8	252	8	244	8	201	40	185	60
24 BWR MPC	MOX	236	20	223	30	223	30	199	40	185	60
44 BWR UCF	MGDS	285	5	270	8	265	8			188	50
44 BWR UCF	MOX	249	10	240	20	236	30			188	50
24 BWR UCF	MGDS	242	10	225	20	222	30			185	60
24 BWR UCF	MOX	226	30	218	30	214	30			185	60

Table 8-2. BWR MOX/Commercial SNF Thermal Analysis Results Summary
(Thermal Loading: 83 MTU/arce)

WP Type	Design Basis SNF	Peak Cladding				Peak Basket		MPC shell		WP Surface	
		Cons. Est.		Best Est.							
		°C	yrs	°C	yrs	°C	yrs	°C	yrs	°C	yr
40 BWR MPC	MGDS	297	0.9	284	0.9	275	1	206	8	165	40
40 BWR MPC	MOX	253	8	246	8	237	8	178	30	165	40
24 BWR MPC	MGDS	259	4	244	4	235	5	182	20	160	50
24 BWR MPC	MOX	225	10	209	10	209	10	178	30	160	50
44 BWR UCF	MGDS	277	4	261	5	256	5			165	40
44 BWR UCF	MOX	239	8	228	10	223	10			165	40
24 BWR UCF	MGDS	230	8	211	10	207	10			160	50
24 BWR UCF	MOX	208	10	197	20	192	20			160	50

As indicated by the data provided in Table 8-1 and Table 8-2, the peak SNF cladding temperatures remain below 350°C and the temperatures for the materials used in the WP conceptual designs are not such that melting or rapid mechanical failure would occur. The MOX and commercial SNF thermal behaviors are similar, and the peak SNF temperature for the MOX BWR WP is about 10° to 30° lower than the commercial BWR WP (based on "best estimate").

The results of the thermal evaluations indicate that the 40, 24 BWR MPC and 44, 24 BWR UCF with disposal container designs loaded with MOX SNF 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. Further, the design conditions are very similar to that for commercial SNF and indicate that specific design changes to accommodate MOX SNF is not required. Thus, this WP conceptual design may be used as a point of departure for analysis of designs put forth by the WP manufacturers. However it should be noted that more analysis is required to determine conditions for anticipated off-normal conditions, drift backfill, and for the WP vendor specific designs.

9. Attachments

The attachments included are summarized in Table 9-1.

Table 9-1. Attachments of Supporting Documentation for the BWR MOX MPC Analysis

Attachment Number	Title / Description	# of Pages
I	MATHCAD File Listing to Curve Fit BWR MOX SNF Assembly Heat Load (File name: bwrmox.mcd)	5
II	MATHCAD Print File of BWR MOX SNF Versus ANSYS Time Steps (File name: bwrmox.prn)	2
III	ANSYS ready input created from MATHCAD Print File. (File name: bwrmox1.dat)	1
IV	Material Properties File for ANSYS; Data from Section 4.1. (File name: props01.dat)	3
V	Effective Thermal Conductivity File; Reference 5.11 (File name: bwr8ke.dat)	3
VI	Model Mesh Plots: 40 BWR MPC; 1) Full Mesh, 2) Full Mesh/No He, 3) Radiation Surfaces	3
VII	Model Mesh Plots: 24 BWR MPC; 1) Full Mesh, 2) Full Mesh/No He, 3) Radiation Surfaces	3
VIII	Model Mesh Plots: 44 BWR UCF; 1) Full Mesh, 2) Full Mesh/No He, 3) Radiation Surfaces	3
IX	Model Mesh Plots: 24 BWR UCF; 1) Full Mesh, 2) Full Mesh/No He, 3) Radiation Surfaces	3
X	Summary of WP Temperatures	16
XI	Boundary Condition File for Large WP at Thermal Loading 100 MTU/acre; Reference 5.13 Large MPC (File name: c21x5a.parm)	11
XII	Boundary Condition File for Large WP at Thermal Loading 83 MTU/acre; Reference 5.13 Large MPC (File name: c21b5a.parm)	11
XIII	Boundary Condition File for Small WP at Thermal Loading 100 MTU/acre; Reference 5.13 Small MPC (File name: c12x5a.parm)	11
XIV	Boundary Condition File for Small WP at Thermal Loading 83 MTU/acre; Reference 5.13 Small MPC (File name: c12b5a.parm)	11
XV*	ANSYS Output for the 100 MTU/acre Thermal Loading for the 40 BWR MPC WP Loaded with the BWR MOX SNF (WP Spacing: 16.2 m; Drift Spacing: 22.5 m)	254
XVI	ANSYS Output for the 83 MTU/acre Thermal Loading for the 40 BWR MPC WP Loaded with the BWR MOX SNF (WP Spacing: 19.5 m; Drift Spacing: 22.5 m)	268
XVII	ANSYS Output for the 100 MTU/acre Thermal Loading for the 24 BWR MPC WP Loaded with the BWR MOX SNF (WP Spacing: 9.2 m; Drift Spacing: 22.5 m)	221

XVIII	ANSYS Output for the 83 MTU/acre Thermal Loading for the 24 BWR MPC WP Loaded with the BWR MOX SNF (WP Spacing: 11.1 m; Drift Spacing: 22.5 m)	227
XIX*	ANSYS Output for the 100 MTU/acre Thermal Loading for the 44 BWR UCF WP Loaded with the BWR MOX SNF (WP Spacing: 16.2 m; Drift Spacing: 22.5 m)	214
XX*	ANSYS Output for the 83 MTU/acre Thermal Loading for the 44 BWR UCF WP Loaded with the BWR MOX SNF (WP Spacing: 19.5 m; Drift Spacing: 22.5 m)	214
XXI	ANSYS Output for the 100 MTU/acre Thermal Loading for the 24 BWR UCF WP Loaded with the BWR MOX SNF (WP Spacing: 16.2 m; Drift Spacing: 22.5 m)	197
XXII	ANSYS Output for the 83 MTU/acre Thermal Loading for the 24 BWR UCF WP Loaded with the BWR MOX SNF (WP Spacing: 19.5 m; Drift Spacing: 22.5 m)	193

* These cases used effective thermal conductivity values to 250 °C by mistake. This causes a slight conservative temperature results for case XV. ANSYS does not extrapolate beyond the tabulated values, instead, it uses the last value in the table for the higher temperature. However, the peak cladding temperature for case XIX and XX does not exceed 250 °C and the peak cladding temperature for case XV is 254 °C. Thus, a use of thermal conductivity values to 250 °C only results in slight conservative temperatures.

1) Read in data from reference 5.40 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(timestep)

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 for use in the curve fit tests) 10 Years is added to the time step vector T in order to perform the curve fit on the BWR MOX data directly (i.e., T is time since MOX SNF discharge from the reactor as stated in reference 5.34) :

$$T = HL^{<1>} + 10 \quad \text{BWR} = HL^{<2>}$$

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}
10	10.35	12	19.5	90	660	5010
10.01	10.4	12.5	20	95	710	5510
10.02	10.45	13	25	100	760	6010
10.03	10.5	13.5	30	105	810	6510
10.04	10.55	14	35	110	860	7010
10.05	10.6	14.5	40	160	910	7510
10.06	10.65	15	45	210	960	8010
10.07	10.7	15.5	50	260	1010	8510
10.08	10.75	16	55	310	1510	9010
10.09	10.8	16.5	60	360	2010	9510
10.1	10.85	17	65	410	2510	10010
10.15	10.9	17.5	70	460	3010	
10.2	10.95	18	75	510	3510	
10.25	11	18.5	80	560	4010	
10.3	11.5	19	85	610	4510	

3) Enter BWR Mox Data from Table 2.10, page 10 of reference 5.34:

The current analysis is interested in W/MOX Assembly after 10 years of cooling to 10,000 years after emplacement, therefore only the data for 10 to 10,000 years after discharge from the reactor will be curve fit.

Tb = the vector containing the base, or reference, time steps

BHG = the vector which contains the base, or reference, W/MOX Assembly

nbt = the number of data points from reference 5.30

bm = the index range counter

nbt = 7

bm = 1 .. nbt

Tb_{bm} =

BHG_{bm} =

10	255.390
30	181.767
100	99.4014
300	57.7384
1000	24.9049
3000	9.55479
10000	5.23460

4) Perform function fit to BWR MOX SNF data:

4.1) Define function equation form for curve fit:

The variables used are defined as follows:

F = Value of W/MOX assembly at time x after discharge

x = Time since discharge for desired W/MOX Assembly

aa = Curve fit coefficient 1

bb = Curve fit coefficient 2

cc = Curve fit coefficient 3

dd = Curve fit coefficient 4

ee = Curve fit coefficient 5

ff = Curve fit coefficient 6

gg = Curve fit coefficient 7

hh = Curve fit coefficient 8

$$F(x, aa, bb, cc, dd, ee, ff, gg, hh) = aa \cdot e^{\left(\frac{x}{bb}\right)} + cc \cdot e^{\left(\frac{x}{dd}\right)} + ee \cdot e^{\left(\frac{x}{ff}\right)} + gg \cdot x + hh$$

4.2) Define an initial guess for each equation coefficient in order to start:

$$\begin{array}{llll} a = 100 & c = 100 & e = 50 & g = 0 \\ b = -30 & d = -100 & f = -1500 & h = 5.0 \end{array}$$

4.3) Define function to minimize:

Function is simply the sum of the squares of the difference between the data point and the curve fit function's estimate of the value of the data point; as per the least squares method (p. 612, Ref. 5.44).

$$SSE(a,b,c,d,e,f,g,h) = \sum_{n=1}^{nbt} (BHG_n - F(Tb_n, a, b, c, d, e, f, g, h))^2$$

4.4) Set MATHCAD to perform least squares solution to obtain curve fit equation coefficients. Set value restrictions for selected coefficients, give MATHCAD the goal of obtaining a set of equation coefficients which sets the function SSE to as close to zero as possible, and assign the newly defined curve fit coefficients to variables for later use.

Given

$$\begin{array}{lllll} SSE(a,b,c,d,e,f,g,h) = 0 & b < 0 & d < 0 & f < 0 & g < 0 \\ & 1 = 1 & 2 = 2 & 3 = 3 & \end{array}$$

$$\begin{bmatrix} a \\ b \\ c \\ d \\ e \\ f \\ g \\ h \end{bmatrix} = \text{Minerr}(a,b,c,d,e,f,g,h)$$

$$DD_i = F(T_i, a, b, c, d, e, f, g, h)$$

$$A^{<1>} = T \quad A^{<2>} = DD$$

$$\text{WRITEPRN(BWRMOX)} = A$$

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710	32.26
760	30.95
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MPTEMP, 7, 176.67, 204.44, 232.22, 260.00, 287.78, 315.56,
MPTEMP, 13, 343.33, 371.11, 398.89, 426.67, 454.44, 482.22,
MPTEMP, 19, 510.00, 537.78, 565.56, 593.33, 621.11, 648.89,
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,
MPDATA, KXX, 1, 7, 15.92, 16.44, 16.96, 17.31, 17.83, 18.17,
MPDATA, KXX, 1,13, 18.52, 19.04, 19.38, 19.90, 20.25, 20.77,

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MPDATA, KXX, 1,19, 21.11, 21.46, 21.98, 22.33, 22.67, 23.02,
MPDATA, KXX, 1,25, 23.54, 23.88, 24.23, 24.58, 24.92, 25.27,
MPDATA, C, 1, 1, 481.68, 486.92, 498.09, 499.38, 509.98, 520.29,
MPDATA, C, 1, 7, 521.07, 527.38, 536.92, 537.34, 543.02, 543.31,
MPDATA, C, 1,13, 546.91, 552.14, 552.26, 557.22, 557.25, 565.11,
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,
MPDATA, KXX, 3, 7, 42.06, 41.88, 41.36, 41.02, 40.50, 39.98,
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,
MPDATA, C, 3,25, 806.31, 888.60,1095.04,1638.78, 808.68, 736.90,
/COM,
/COM,          Define K for material 2
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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, 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,
/COM,
/COM,          Define C for material 2
MPTEMP
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,
/COM,
/COM,          Define K for materials 4, 5, 6
MPTEMP
MPTEMP, 1, 0.0, 10.0, 20.0, 30.0, 40.0, 50.0,
MPTEMP, 7, 60.0, 70.0, 80.0, 90.0, 100.0, 110.0,
MPTEMP, 13, 120.0, 130.0, 140.0, 150.0, 160.0, 170.0,
MPTEMP, 19, 180.0, 190.0, 200.0, 210.0, 220.0, 230.0,
MPTEMP, 25, 240.0, 250.0, 260.0, 270.0, 280.0, 290.0,
MPTEMP, 31, 300.0, 310.0, 320.0, 330.0, 340.0, 350.0,
MPTEMP, 37, 360.0, 370.0, 380.0, 390.0, 400.0, 410.0,
MPTEMP, 43, 420.0, 430.0, 440.0, 450.0, 460.0, 470.0,
MPTEMP, 48, 480.0, 490.0, 500.0,
MPDATA, KXX, 4, 1, 8.72, 8.54, 8.36, 8.19, 8.03, 7.87,
MPDATA, KXX, 4, 7, 7.72, 7.58, 7.44, 7.31, 7.18, 7.05,
MPDATA, KXX, 4,13, 6.93, 6.82, 6.70, 6.60, 6.49, 6.39,
MPDATA, KXX, 4,19, 6.29, 6.19, 6.10, 6.01, 5.92, 5.84,
MPDATA, KXX, 4,25, 5.76, 5.68, 5.60, 5.52, 5.45, 5.38,
MPDATA, KXX, 4,31, 5.31, 5.24, 5.18, 5.11, 5.05, 4.99,
MPDATA, KXX, 4,37, 4.93, 4.87, 4.81, 4.76, 4.70, 4.65,
MPDATA, KXX, 4,43, 4.60, 4.55, 4.50, 4.45, 4.40, 4.35,
MPDATA, KXX, 4,48, 4.31, 4.27, 4.22,
MPDATA, KXX, 5, 1, 12.29, 12.44, 12.58, 12.72, 12.87, 13.01,
MPDATA, KXX, 5, 7, 13.15, 13.28, 13.42, 13.55, 13.69, 13.82,
MPDATA, KXX, 5,13, 13.95, 14.08, 14.21, 14.34, 14.46, 14.59,
MPDATA, KXX, 5,19, 14.72, 14.84, 14.96, 15.09, 15.21, 15.33,
MPDATA, KXX, 5,25, 15.45, 15.57, 15.69, 15.81, 15.93, 16.05,
MPDATA, KXX, 5,31, 16.17, 16.29, 16.40, 16.52, 16.64, 16.76,
MPDATA, KXX, 5,37, 16.88, 16.99, 17.11, 17.23, 17.35, 17.46,
MPDATA, KXX, 5,43, 17.58, 17.70, 17.82, 17.94, 18.06, 18.18,
MPDATA, KXX, 5,48, 18.30, 18.42, 18.54,
MPDATA, KXX, 6, 1, 1.94, 1.94, 1.94, 1.94, 1.94, 1.94,

```

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MPDATA, KXX, 6, 7, 1.94, 1.95, 1.95, 1.95, 1.95, 1.95,
MPDATA, KXX, 6, 13, 1.95, 1.95, 1.96, 1.96, 1.96, 1.96,
MPDATA, KXX, 6, 19, 1.96, 1.97, 1.97, 1.97, 1.97, 1.98,
MPDATA, KXX, 6, 25, 1.98, 1.98, 1.98, 1.99, 1.99, 1.99,
MPDATA, KXX, 6, 31, 2.00, 2.00, 2.00, 2.01, 2.01, 2.01,
MPDATA, KXX, 6, 37, 2.02, 2.02, 2.02, 2.03, 2.03, 2.03,
MPDATA, KXX, 6, 43, 2.04, 2.04, 2.04, 2.05, 2.05, 2.06,
MPDATA, KXX, 6, 48, 2.06, 2.06, 2.07,

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/COM,

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

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MPTEMP

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MPTEMP, 7, 226.85, 276.85, 326.85, 376.85, 426.85, 476.85,
MPTEMP, 13, 526.85, 626.85, 726.85,

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```

MPDATA, DENS, 7, 1, 0.1875, 0.1750, 0.1625, 0.1422, 0.1219, 0.1097,

```

```

MPDATA, DENS, 7, 7, 0.0975, 0.0906, 0.0836, 0.0767, 0.0697, 0.0662,

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MPDATA, DENS, 7, 13, 0.0627, 0.0558, 0.0488,

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MPDATA, KXX, 7, 1, 0.1370, 0.1450, 0.1520, 0.1700, 0.1870, 0.2040,

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MPDATA, KXX, 7, 7, 0.2200, 0.2360, 0.2520, 0.2640, 0.2780, 0.2910,

```

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MPDATA, KXX, 7, 13, 0.3040, 0.3300, 0.3540,

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MPDATA, DENS, 8, 1, 1.3480, 1.2547, 1.1614, 0.9950, 0.8711, 0.7740,

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MPDATA, DENS, 8, 7, 0.6964, 0.6329, 0.5804, 0.5356, 0.4975, 0.4643,

```

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MPDATA, DENS, 8, 13, 0.4354, 0.3868, 0.3482,

```

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MPDATA, KXX, 8, 1, 0.0230, 0.0250, 0.0260, 0.0300, 0.0340, 0.0370,

```

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MPDATA, KXX, 8, 7, 0.0410, 0.0440, 0.0470, 0.0500, 0.0520, 0.0550,

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MPDATA, KXX, 8, 13, 0.0570, 0.0620, 0.0670,

```

```

MPDATA, C, 8, 1, 1006.2, 1006.6, 1007.0, 1009.0, 1014.0, 1021.0,

```

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MPDATA, C, 8, 7, 1030.0, 1040.0, 1051.0, 1063.0, 1075.0, 1087.0,

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MPDATA, C, 8, 13, 1099.0, 1121.0, 1141.0,

```

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MPDATA, DENS, 9, 1, 1.3037, 1.2135, 1.1233, 0.9625, 0.8425, 0.7485,

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```

MPDATA, DENS, 9, 7, 0.6739, 0.6124, 0.5615, 0.5214, 0.4812, 0.4512,

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MPDATA, DENS, 9, 13, 0.4211, 0.3743, 0.3368,

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MPDATA, KXX, 9, 1, 0.0230, 0.0240, 0.0260, 0.0290, 0.0330, 0.0360,

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MPDATA, KXX, 9, 7, 0.0390, 0.0420, 0.0450, 0.0470, 0.0500, 0.0520,

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MPDATA, KXX, 9, 13, 0.0550, 0.0600, 0.0650,

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MPDATA, C, 9, 1, 1041.8, 1041.4, 1041.0, 1042.0, 1045.0, 1050.0,

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MPDATA, C, 9, 7, 1056.0, 1065.0, 1075.0, 1086.5, 1098.0, 1159.0,

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MPDATA, C, 9, 13, 1220.0, 1146.0, 1167.0,

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MPDATA, KXX, 10, 1, 0.0170, 0.0170, 0.0180, 0.0210, 0.0230, 0.0250,

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```

MPDATA, KXX, 10, 7, 0.0270, 0.0280, 0.0300, 0.0320, 0.0340, 0.0360,

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```

MPDATA, KXX, 10, 13, 0.0370, 0.0410, 0.0440,

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```

/COM,

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```

/COM, Define K and C for material 12

```

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MPTEMP

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MPDATA, KXX, 12, 1, 413.0, 401.0, 393.0, 379.0, 366.0, 352.0,

```

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MPDATA, C, 12, 1, 356.0, 385.0, 397.0, 417.0, 433.0, 451.0,

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```

/COM,

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/COM, Define K and C for material 13

```

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MPTEMP

```

```

MPTEMP, 1, 23.00, 50.00, 100.00, 150.00, 200.00,

```

```

MPDATA, KXX, 13, 1, 182.56, 190.17, 199.22, 202.91, 203.72,

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```

MPDATA, C, 13, 1, 868.00, 903.00, 946.00, 976.00, 998.00,

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/COM,

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```

/COM, *****

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/COM, *****

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/EOF,

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/COM, *****

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/COM,
/COM, BWR 8x8 pin array with out a channel in a helium Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
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MPTEMP, 1, .00000E+00,
MPDATA,DENS,14, 1, .38824E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.310, 0.344, 0.382, 0.423, 0.470, 0.520,
MPDATA, KXX,14, 7, 0.574, 0.632, 0.694, 0.760, 0.830, 0.903,
MPDATA, KXX,14,13, 0.980, 1.061, 1.145, 1.233,
/COM, *****
/COM, Define new material 14 for effective conductivity
/COM,
/COM, BWR 8x8 pin array with a channel in a Helium Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
MPTEMP, 1, .00000E+00,
MPDATA,DENS,14, 1, .38824E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.297, 0.325, 0.355, 0.389, 0.426, 0.466,
MPDATA, KXX,14, 7, 0.509, 0.555, 0.604, 0.656, 0.711, 0.769,
MPDATA, KXX,14,13, 0.831, 0.895, 0.963, 1.033,
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/COM, Define new material 14 for effective conductivity
/COM,
/COM, BWR 8x8 pin array with out a channel in a Vacuum Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
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MPDATA,DENS,14, 1, .38824E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.086, 0.105, 0.129, 0.157, 0.190, 0.228,
MPDATA, KXX,14, 7, 0.271, 0.318, 0.370, 0.426, 0.487, 0.553,
MPDATA, KXX,14,13, 0.624, 0.699, 0.779, 0.863,
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/COM,
/COM, BWR 8x8 pin array with a channel in a Vacuum Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
MPTEMP, 1, .00000E+00,
MPDATA,DENS,14, 1, .38824E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP

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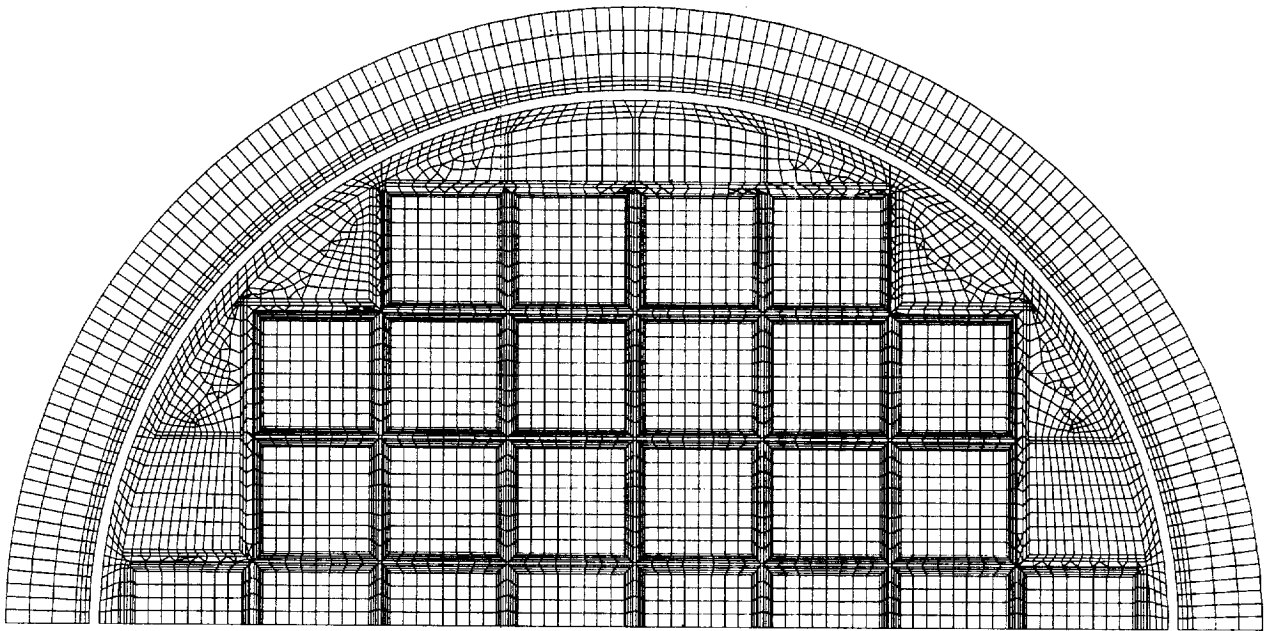
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MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.068, 0.084, 0.102, 0.124, 0.150, 0.179,
MPDATA, KXX,14, 7, 0.212, 0.249, 0.290, 0.334, 0.382, 0.434,
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/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
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MPDATA,DENS,14, 1, .388242E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
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MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.128, 0.151, 0.178, 0.209, 0.246, 0.286,
MPDATA, KXX,14, 7, 0.332, 0.381, 0.435, 0.494, 0.557, 0.625,
MPDATA, KXX,14,13, 0.696, 0.772, 0.853, 0.937,
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/COM,
/COM, BWR 8x8 pin array with a channel in a Nitrogen Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
MPTEMP, 1, .00000E+00,
MPDATA,DENS,14, 1, .388242E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.109, 0.126, 0.148, 0.173, 0.201, 0.233,
MPDATA, KXX,14, 7, 0.269, 0.308, 0.350, 0.396, 0.446, 0.499,
MPDATA, KXX,14,13, 0.556, 0.616, 0.679, 0.747,
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/COM,
/COM, BWR 8x8 pin array with out a channel in a argon Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)
MPTEMP
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MPDATA,DENS,14, 1, .388242E+04,
MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.117, 0.139, 0.164, 0.195, 0.230, 0.269,
MPDATA, KXX,14, 7, 0.313, 0.362, 0.415, 0.473, 0.535, 0.602,
MPDATA, KXX,14,13, 0.673, 0.749, 0.830, 0.915,
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/COM, Define new material 14 for effective conductivity
/COM,
/COM, BWR 8x8 pin array with a channel in a Argon Environment
/COM, Density: DENS (kg/m^3)
/COM, Conductivity: KXX (W/m/K)
/COM, Specific Heat: C (J/kg/K)

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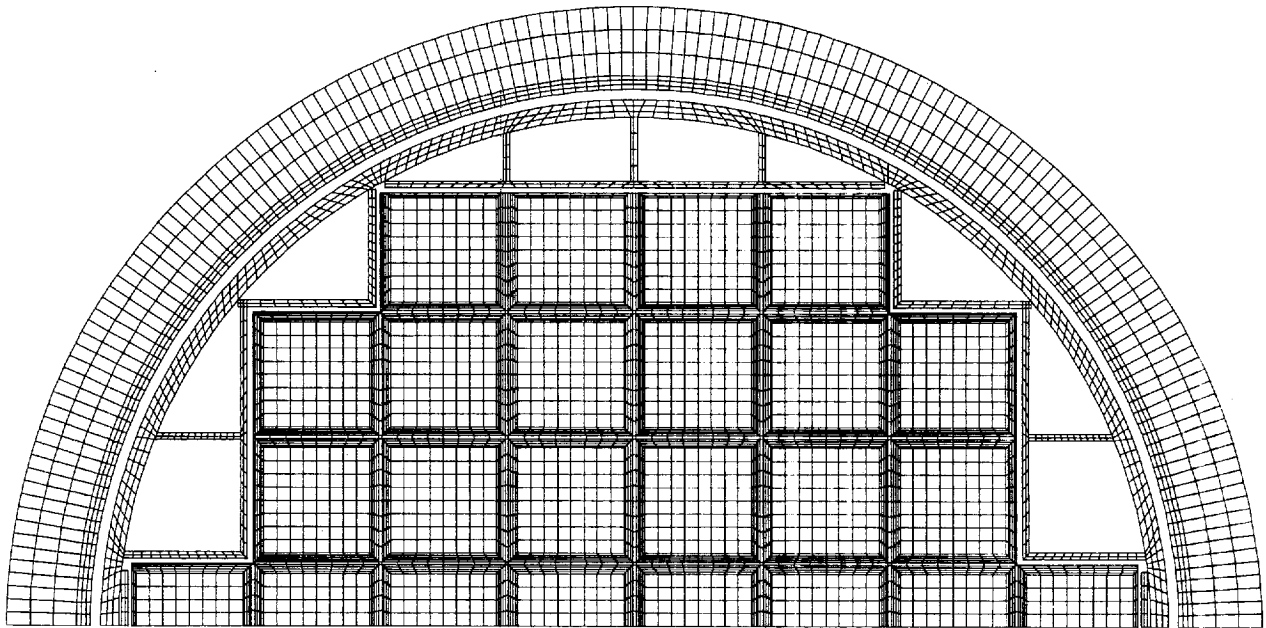
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MPTEMP
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MPDATA, C,14, 1, .273129E+03,
/COM, Store average effective conductivities
MPTEMP
MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
MPDATA, KXX,14, 1, 0.098, 0.114, 0.134, 0.158, 0.186, 0.217,
MPDATA, KXX,14, 7, 0.251, 0.290, 0.332, 0.377, 0.426, 0.479,
MPDATA, KXX,14,13, 0.535, 0.594, 0.658, 0.724,
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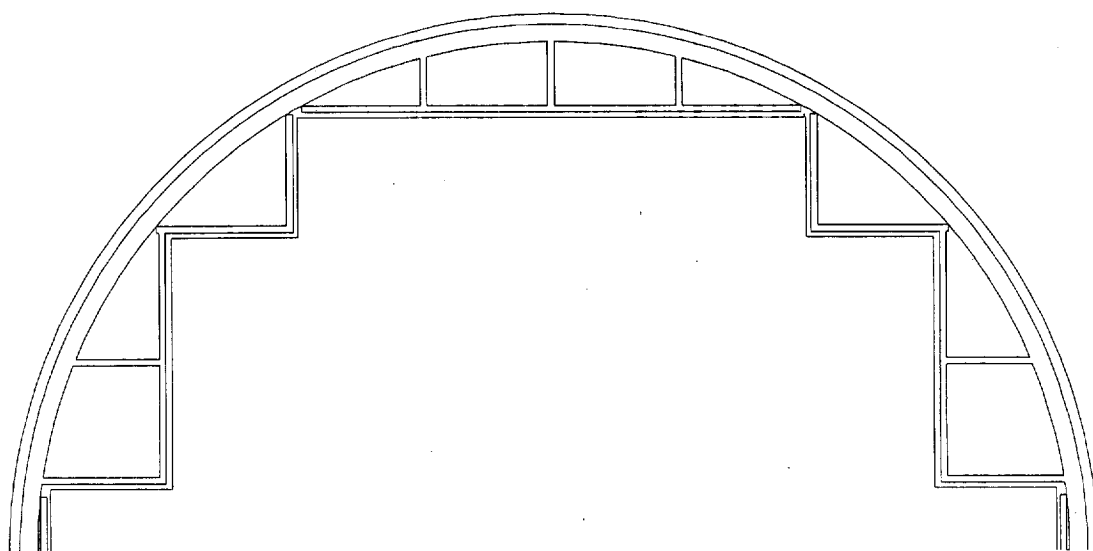
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ELEMENTS
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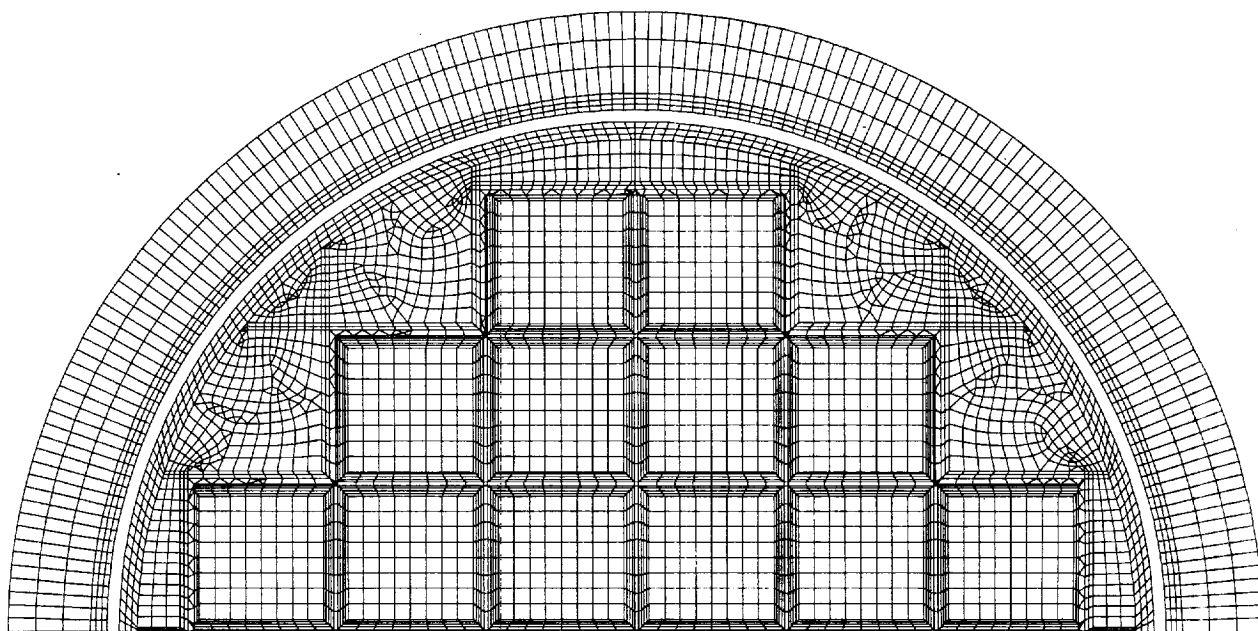
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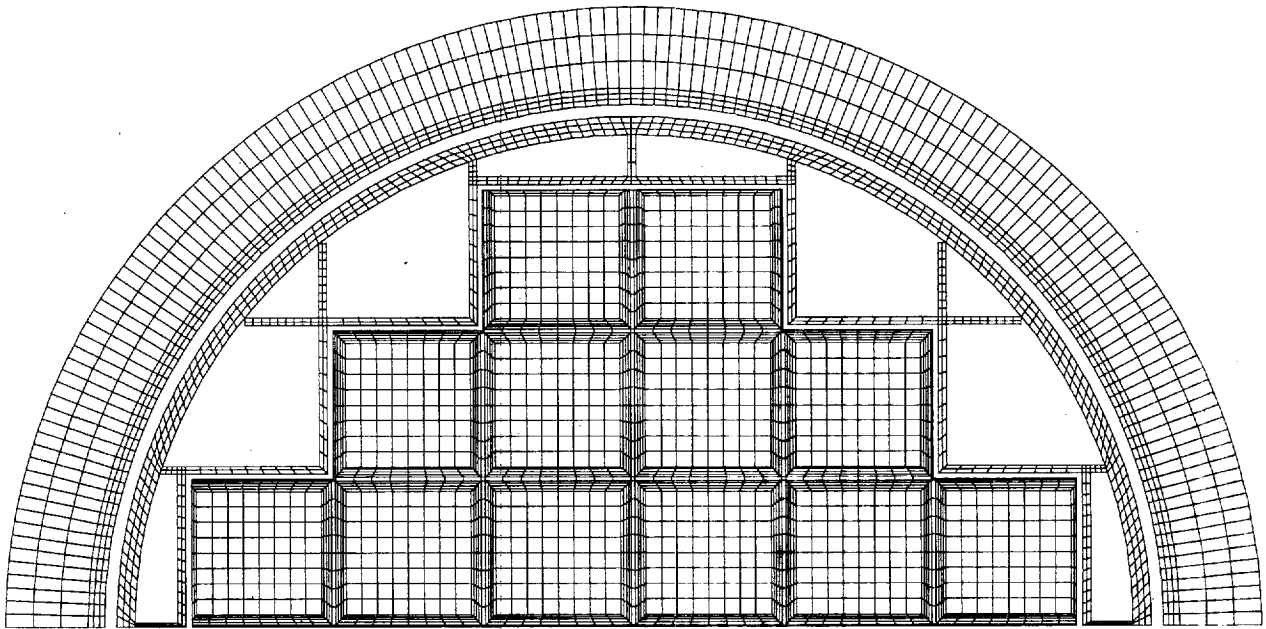
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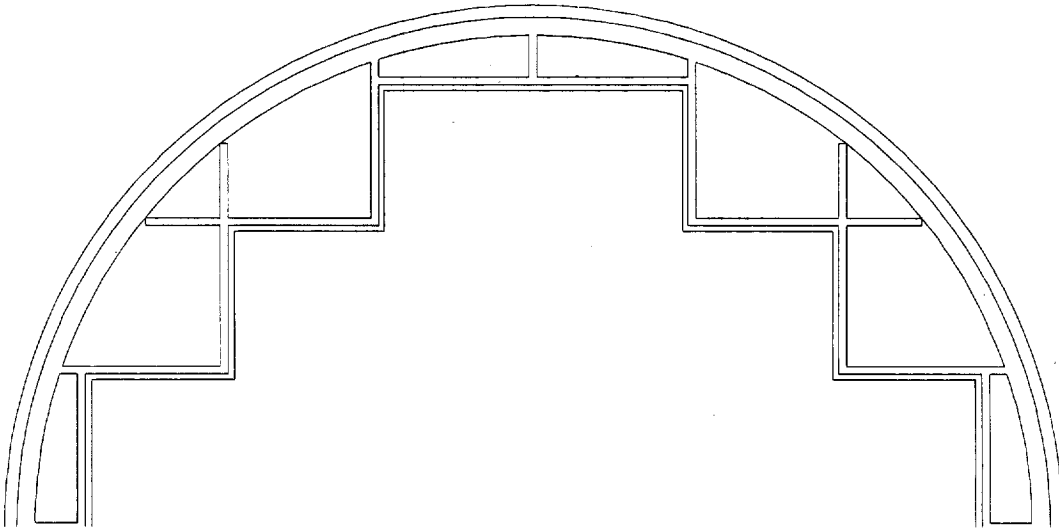
24 BWR MPC/Waste Package - 1/2 FEM Model

ANSYS 5.1 24
JUL 3 1996
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PLOT NO. 1
ELEMENTS
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DIST=0.841775
*XF =0.076525



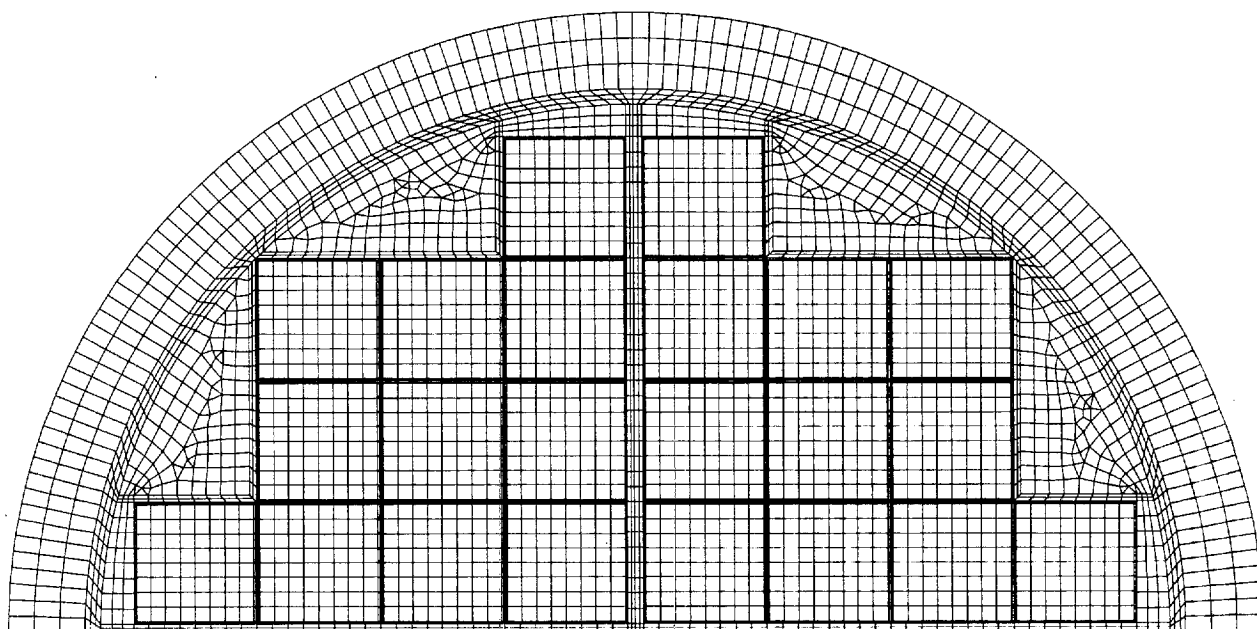
24 BWR MPC/Waste Package - 1/2 FEM Model

ANSYS 5.1 24
JUL 3 1996
15:52:34
PLOT NO. 1
ELEMENTS
TYPE NUM
ZV =1
DIST=0.841775
*XF =0.076525



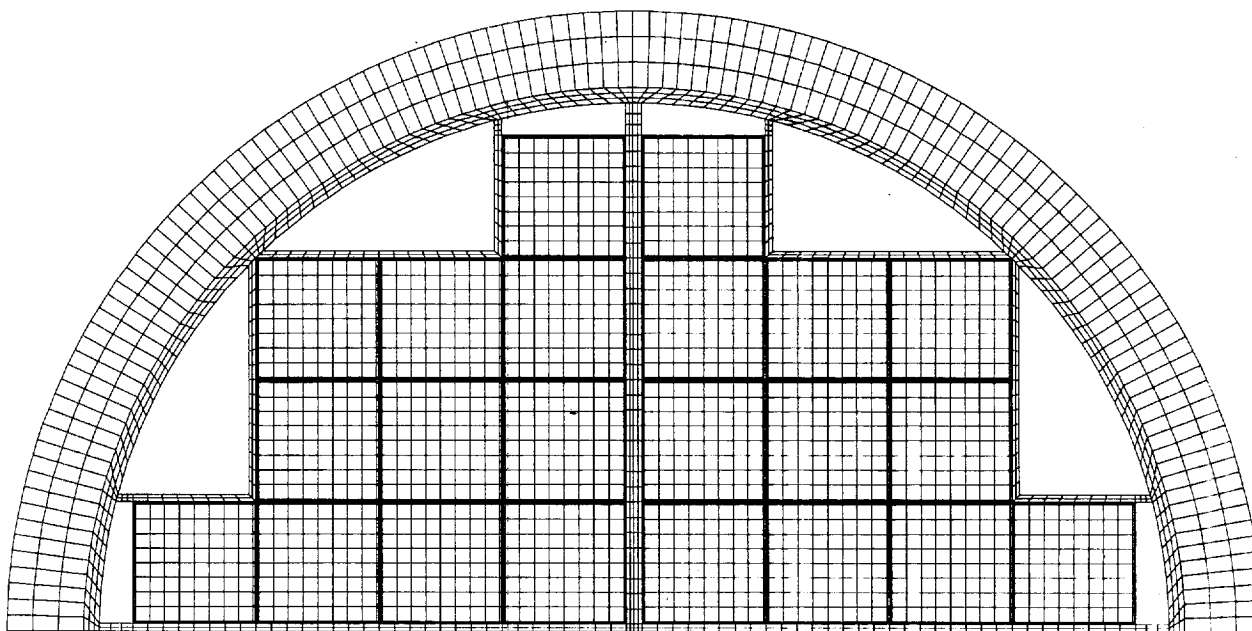
24 BWR MPC/Waste Package - Radiation Matrix

ANSYS 5.1 24
JUL 4 1996
07:30:21
PLOT NO. 1
ELEMENTS
MAT NUM
ZV =1
DIST=0.8943
*XF =0.09008

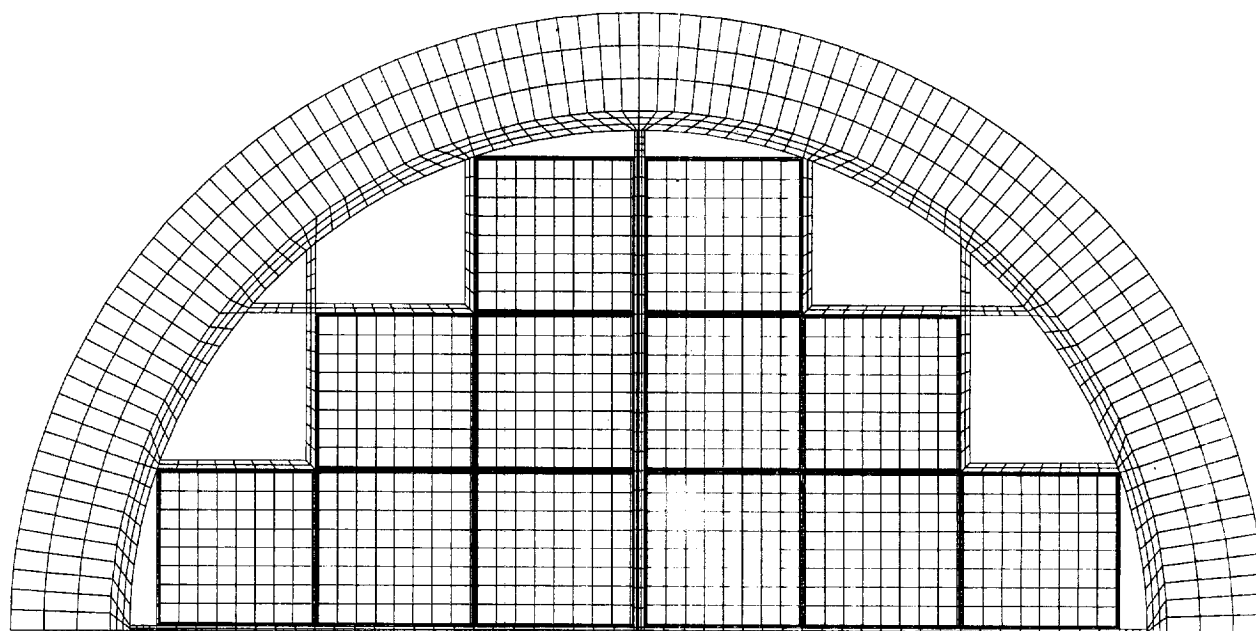


44 BWR UCF/Waste Package - 1/2 FEM Model

ANSYS 5.1 24
JUL 4 1996
07:30:23
PLOT NO. 1
ELEMENTS
MAT NUM
ZV =1
DIST=0.8943
*XF =0.09008



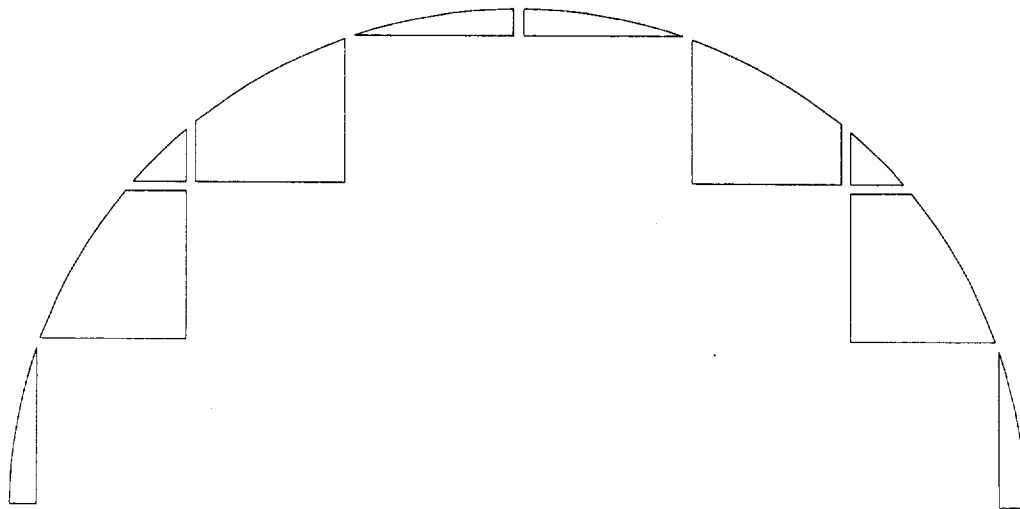
ANSYS 5.1 24
JUL 5 1996
08:42:10
PLOT NO. 1
ELEMENTS
MAT NUM
ZV =1
DIST=0.69553
*XF =0.076525



24 BWR UCF/Waste Package - 1/2 FEM Model

ANSYS 5.1 24
 JUL 5 1996
 08:42:11
 PLOT NO. 1
 ELEMENTS
 TYPE NUM

ZV =1
 DIST=0.69553
 *XF =0.076525



40 BWR MPC MOX

100 MTU/acre with 16.2m WP Spacing

10 year old, 37.6 MWD/kgHM burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	222	213	202	141	69	26	26	26	26
0.1	255.10	236	228	217	160	98	71	48	30	26
0.2	254.60	239	231	221	164	105	79	57	36	27
0.3	254.10	242	234	223	167	109	85	62	40	27
0.4	253.60	243	235	225	169	113	89	66	44	29
0.5	253.10	245	237	226	171	116	92	70	47	30
0.6	252.60	246	238	228	173	118	95	73	49	32
0.7	252.10	247	239	229	174	120	97	75	52	34
0.8	251.70	248	240	230	175	122	100	78	54	36
0.9	251.20	248	241	231	176	123	102	80	56	38
1	250.70	249	241	231	177	125	103	82	58	40
2	246.00	253	246	236	184	135	116	95	73	55
3	241.40	256	249	239	188	142	124	104	84	67
4	237.00	257	251	241	192	147	131	111	91	75
5	232.70	259	252	243	194	152	136	117	97	82
6	228.60	260	253	244	197	156	141	122	102	88
7	224.60	260	254	245	199	159	145	127	106	92
8	220.70	261	254	246	200	162	148	130	110	95
9	216.90	260	254	246	201	164	151	133	113	97
10	213.30	260	254	246	202	166	153	136	116	99
20	182.60	257	251	244	207	177	167	154	138	125
30	160.00	254	249	243	210	185	177	165	152	141
40	143.10	250	245	239	210	188	181	171	160	150
50	130.30	245	241	235	209	188	182	174	164	155
60	120.30	241	237	232	207	188	183	175	166	159
70	112.50	237	233	228	205	187	182	175	167	161
80	106.10	233	229	225	203	186	181	175	168	162
90	100.80	23	226	222	201	184	180	174	168	162
100	96.34	227	223	219	199	183	179	174	168	162
200	69.87	209	206	203	188	176	174	170	166	163
300	55.34	198	195	193	181	171	169	166	163	160
400	46.03	191	189	187	176	168	166	164	161	159
500	39.82	186	184	182	173	166	164	162	160	158
600	35.46	182	180	178	170	164	162	161	159	157
700	32.26	178	177	175	168	161	160	159	157	155
800	29.78	175	173	171	165	159	158	156	155	153
900	27.76	171	170	168	162	156	155	154	153	151
1000	26.04	168	167	165	159	154	153	152	151	149

40 BWR MPC

100 MTU/acre with 16.2m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	283	268	258	160	69	26	26	26	26
0.1	407.68	293	279	270	176	98	71	48	30	26
0.2	405.97	296	282	273	180	105	79	57	36	27
0.3	404.28	297	283	274	182	109	85	62	40	27
0.4	402.61	298	284	275	184	113	89	66	44	29
0.5	400.97	299	285	276	185	116	92	70	47	30
0.6	399.34	299	286	277	187	118	95	73	49	32
0.7	397.74	300	286	277	188	120	97	75	52	34
0.8	396.16	300	287	278	189	122	100	78	54	36
0.9	394.60	300	287	278	189	123	102	80	56	38
1	393.06	300	287	278	190	125	103	82	58	40
2	379.49	301	288	280	195	135	116	95	73	55
3	367.70	300	288	280	199	142	124	104	84	67
4	357.29	300	288	280	201	147	131	111	91	75
5	348.30	299	287	280	203	152	136	117	97	82
6	339.03	298	287	279	205	156	141	122	102	88
7	331.00	297	286	279	206	159	145	127	106	92
8	323.52	297	285	278	208	162	148	130	110	95
9	316.46	295	284	277	208	164	151	133	113	97
10	310.56	294	283	276	209	166	153	136	116	99
20	255.61	283	273	267	212	177	167	154	138	125
30	214.52	274	265	260	213	185	177	165	152	141
40	183.32	264	257	252	211	188	181	171	160	150
50	157.90	255	248	244	209	188	182	174	164	155
60	138.15	248	241	238	206	188	183	175	166	159
70	122.25	241	235	232	204	187	182	175	167	161
80	109.37	234	229	226	200	186	181	175	168	162
90	99.33	229	224	221	198	184	180	174	168	162
100	90.35	224	219	217	196	183	179	174	168	162
200	51.61	201	198	196	184	176	174	170	166	163
300	38.89	190	188	186	177	171	169	166	163	160
400	31.79	184	182	181	173	168	166	164	161	159
500	27.23	180	178	177	170	166	164	162	160	158
600	23.69	176	174	174	167	164	162	161	159	157
700	31.02	173	171	170	165	161	160	159	157	155
800	18.76	169	167	167	162	159	158	156	155	153
900	16.96	166	164	164	159	156	155	154	153	151
1000	15.49	163	161	161	157	154	153	152	151	149

40 BWR MPC MOX

83 MTU/acre with 19.5m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	222	213	201	116	69	26	26	26	26
0.1	255.10	235	227	216	130	97	69	47	30	26
0.2	254.60	238	230	219	135	102	76	55	35	27
0.3	254.10	240	232	221	137	106	81	60	39	27
0.4	253.60	241	233	223	139	109	84	63	42	29
0.5	253.10	242	234	224	141	111	87	66	45	30
0.6	252.60	243	235	225	142	113	89	69	47	32
0.7	252.10	244	236	225	144	114	91	71	49	33
0.8	251.70	244	237	226	145	116	93	73	51	35
0.9	251.20	245	237	227	146	117	95	74	53	36
1	250.70	245	238	227	147	118	96	76	55	38
2	246.00	249	241	231	154	127	107	88	67	51
3	241.40	250	243	234	158	134	115	96	77	61
4	237.00	252	244	235	162	138	120	102	84	69
5	232.70	252	245	236	164	142	125	107	89	75
6	228.60	253	246	237	167	145	129	112	94	80
7	224.60	253	246	237	169	148	132	115	98	85
8	220.70	253	246	237	170	150	135	119	101	89
9	216.90	252	246	237	172	152	137	121	104	92
10	213.30	252	245	237	172	153	139	123	106	94
20	182.60	245	239	231	176	160	149	136	122	109
30	160.00	238	233	226	178	164	155	144	132	122
40	143.10	232	227	221	178	165	157	148	138	129
50	130.30	227	222	216	177	165	158	150	141	134
60	120.30	222	217	212	175	164	158	151	143	136
70	112.50	218	213	208	174	163	158	151	144	138
80	106.10	214	209	204	172	162	156	151	144	139
90	100.80	210	206	201	170	160	156	150	144	139
100	96.34	207	203	199	169	159	155	150	144	139
200	69.87	189	186	182	160	152	150	146	143	140
300	55.34	178	175	173	155	148	146	143	141	138
400	46.03	171	169	166	151	146	144	142	139	138
500	39.82	166	164	162	149	144	142	140	138	137
600	35.46	162	160	158	146	142	140	139	137	135
700	32.26	159	156	155	144	140	138	137	135	134
800	29.78	156	154	152	142	138	137	135	134	133
900	27.76	153	151	150	140	136	135	134	133	132
1000	26.04	151	149	148	139	135	134	133	132	131

40 BWR MPC

83 MTU/acre with 19.5m WP Spacing

10 year old, 49GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	283	268	258	171	69	26	26	26	26
0.1	407.68	293	278	269	185	97	69	47	30	26
0.2	405.97	295	281	271	188	102	76	55	35	27
0.3	404.28	296	282	273	190	106	81	60	39	27
0.4	402.61	296	282	273	191	109	84	63	42	29
0.5	400.97	297	283	274	192	111	87	66	45	30
0.6	399.34	297	283	274	193	113	89	69	47	32
0.7	397.74	297	284	275	194	114	91	71	49	33
0.8	396.16	297	284	275	195	116	93	73	51	35
0.9	394.60	297	284	275	195	117	95	74	53	36
1	393.06	297	284	275	196	118	96	76	55	38
2	379.49	297	284	275	199	127	107	88	67	51
3	367.70	296	283	275	201	134	115	96	77	61
4	357.29	295	282	274	203	138	120	102	84	69
5	348.30	294	282	274	204	142	125	107	89	75
6	339.03	292	280	273	205	145	129	112	94	80
7	331.00	291	279	272	206	148	132	115	98	85
8	323.52	290	278	271	206	150	135	119	101	89
9	316.46	288	277	269	206	152	137	121	104	92
10	310.56	287	276	268	206	153	139	123	106	94
20	255.61	272	262	256	204	160	149	136	122	109
30	214.52	259	250	244	201	164	155	144	132	122
40	183.32	248	239	235	197	165	157	148	138	129
50	157.90	238	230	226	193	165	158	150	141	134
60	138.15	229	222	218	189	164	158	151	143	136
70	122.25	222	215	212	185	163	158	151	144	138
80	109.37	215	209	205	182	162	156	151	144	139
90	99.33	209	204	201	179	160	156	150	144	139
100	90.35	204	199	196	176	159	155	150	144	139
200	51.61	180	176	175	163	152	150	146	143	140
300	38.89	170	167	165	156	148	146	143	141	138
400	31.79	164	161	160	153	146	144	142	139	138
500	27.23	159	157	156	150	144	142	140	138	137
600	23.69	155	153	153	147	142	140	139	137	135
700	31.02	152	150	149	144	140	138	137	135	134
800	18.76	149	147	147	142	138	137	135	134	133
900	16.96	147	145	145	140	136	135	134	133	132
1000	15.49	145	143	143	139	135	134	133	132	131

24 BWR MPC MOX

100 MTU/acre with 9.2m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	190	167	167	116	58	26	26	26	26
0.1	255.10	202	180	180	133	83	60	43	29	26
0.2	254.60	206	185	185	138	90	68	51	34	26
0.3	254.10	209	187	187	141	94	74	56	38	27
0.4	253.60	211	190	190	144	98	79	61	42	29
0.5	253.10	212	191	191	146	101	82	64	45	30
0.6	252.60	214	193	193	147	104	85	67	47	32
0.7	252.10	215	194	194	149	106	88	70	50	34
0.8	251.70	216	195	195	151	108	90	72	52	36
0.9	251.20	217	196	196	152	110	92	75	54	37
1	250.70	218	197	197	153	112	94	77	56	39
2	246.00	223	204	204	161	123	108	91	72	55
3	241.40	226	208	208	166	131	116	100	82	66
4	237.00	229	211	211	171	137	123	107	90	75
5	232.70	231	213	213	174	142	129	113	96	82
6	228.60	233	215	215	177	146	134	119	101	87
7	224.60	234	217	217	180	150	138	123	105	92
8	220.70	235	218	218	182	153	142	127	109	95
9	216.90	235	219	219	183	155	145	130	112	97
10	213.30	235	219	219	184	157	147	132	115	99
20	182.60	236	222	222	193	171	163	151	137	125
30	160.00	236	223	223	198	180	173	163	151	141
40	143.10	233	222	222	199	183	178	169	159	150
50	130.30	230	220	220	199	184	180	172	163	155
60	120.30	227	217	217	198	184	180	174	166	158
70	112.50	224	215	215	197	184	180	174	167	160
80	106.10	221	212	212	195	183	179	174	167	161
90	100.80	218	210	210	193	182	179	173	167	162
100	96.34	216	208	208	192	180	178	173	167	162
200	69.87	201	195	195	183	174	172	169	166	163
300	55.34	191	186	186	176	169	168	165	163	160
400	46.03	185	180	180	172	166	165	163	161	159
500	39.82	181	177	177	170	165	164	162	160	158
600	35.46	177	174	174	167	163	162	160	158	157
700	32.26	174	170	170	165	160	159	158	157	155
800	29.78	171	167	167	162	158	157	156	154	153
900	27.76	168	164	164	159	155	155	154	152	151
1000	26.04	165	162	162	157	153	153	152	150	149

24 BWR MPC

100 MTU/acre with 9.2m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	243	225	214	135	58	26	26	26	26
0.1	407.68	252	235	225	149	83	60	43	29	26
0.2	405.97	255	238	228	154	90	68	51	34	26
0.3	404.28	257	240	230	157	94	74	56	38	27
0.4	402.61	258	242	231	159	98	79	61	42	29
0.5	400.97	259	243	232	161	101	82	64	45	30
0.6	399.34	260	244	233	162	104	85	67	47	32
0.7	397.74	260	244	234	163	106	88	70	50	34
0.8	396.16	261	245	235	165	108	90	72	52	36
0.9	394.60	261	245	235	166	110	92	75	54	37
1	393.06	262	246	236	167	112	94	77	56	39
2	379.49	264	249	239	173	123	108	91	72	55
3	367.70	264	250	241	177	131	116	100	82	66
4	357.29	265	251	242	181	137	123	107	90	75
5	348.30	265	251	243	184	142	129	113	96	82
6	339.03	265	252	243	186	146	134	119	101	87
7	331.00	265	252	244	188	150	138	123	105	92
8	323.52	265	252	244	190	153	142	127	109	95
9	316.46	264	251	244	191	155	145	130	112	97
10	310.56	264	251	243	192	157	147	132	115	99
20	255.61	257	246	240	198	171	163	151	137	125
30	214.52	252	242	237	201	180	173	163	151	141
40	183.32	245	237	232	201	183	178	169	159	150
50	157.90	238	231	227	200	184	180	172	163	155
60	138.15	232	225	222	198	184	180	174	166	158
70	122.25	227	221	217	196	184	180	174	167	160
80	109.37	222	216	213	194	183	179	174	167	161
90	99.33	218	212	209	192	182	179	173	167	162
100	90.35	214	208	206	190	180	178	173	167	162
200	51.61	194	191	189	180	174	172	169	166	163
300	38.89	185	182	181	174	169	168	165	163	160
400	31.79	180	177	176	170	166	165	163	161	159
500	27.23	176	174	173	168	165	164	162	160	158
600	23.69	173	171	170	165	163	162	160	158	157
700	31.02	169	168	167	163	160	159	158	157	155
800	18.76	166	164	164	160	158	157	156	154	153
900	16.96	163	161	161	158	155	155	154	152	151
1000	15.49	160	159	158	155	153	153	152	150	149

24 BWR MPC MOX

83 MTU/acre with 11.1m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

4/17/97

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	189	166	166	116	57	26	26	26	26
0.1	255.10	200	178	178	130	79	57	41	29	26
0.2	254.60	204	182	182	135	85	64	48	33	26
0.3	254.10	206	184	184	137	89	68	53	37	27
0.4	253.60	207	186	186	139	92	72	56	39	28
0.5	253.10	208	187	187	141	95	75	59	42	30
0.6	252.60	209	188	188	142	97	78	62	44	31
0.7	252.10	210	189	189	144	99	80	64	46	33
0.8	251.70	211	190	190	145	100	82	66	48	34
0.9	251.20	212	191	191	146	102	83	68	50	36
1	250.70	212	192	192	147	103	85	69	52	37
2	246.00	217	197	197	154	113	97	82	65	50
3	241.40	220	201	201	158	120	105	91	75	60
4	237.00	222	203	203	162	125	111	97	82	68
5	232.70	223	205	205	164	130	116	102	87	75
6	228.60	224	206	206	167	133	120	107	92	80
7	224.60	225	207	207	169	136	124	111	96	84
8	220.70	225	208	208	170	139	127	114	99	88
9	216.90	225	208	208	172	141	130	117	102	91
10	213.30	225	209	209	172	143	132	119	105	94
20	182.60	222	207	207	176	152	143	133	120	109
30	160.00	218	205	205	178	157	150	141	131	122
40	143.10	214	202	202	178	159	153	145	137	129
50	130.30	210	199	199	177	160	154	148	140	133
60	120.30	206	196	196	175	159	155	149	142	136
70	112.50	203	193	193	174	159	155	149	143	138
80	106.10	200	190	190	172	158	154	149	143	139
90	100.80	197	188	188	170	157	153	149	143	139
100	96.34	195	186	186	169	156	152	148	143	139
200	69.87	180	173	173	160	150	148	146	143	140
300	55.34	171	165	165	155	146	145	143	140	138
400	46.03	165	160	160	151	144	143	141	139	137
500	39.82	161	156	156	149	142	141	140	138	137
600	35.46	157	153	153	146	140	139	138	137	135
700	32.26	154	150	150	144	139	138	136	135	134
800	29.78	151	147	147	142	137	136	135	134	133
900	27.76	149	145	145	140	136	135	134	133	132
1000	26.04	147	144	144	139	134	134	133	132	131

24 BWR MPC

83 MTU/acre with 11.1m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	MPC Side	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	243	225	214	135	57	26	26	26	26
0.1	407.68	251	234	223	148	79	57	41	29	26
0.2	405.97	253	236	226	151	85	64	48	33	26
0.3	404.28	254	238	227	153	89	68	53	37	27
0.4	402.61	255	239	228	155	92	72	56	39	28
0.5	400.97	256	239	229	156	95	75	59	42	30
0.6	399.34	256	240	230	157	97	78	62	44	31
0.7	397.74	257	241	230	159	99	80	64	46	33
0.8	396.16	257	241	231	159	100	82	66	48	34
0.9	394.60	257	241	231	160	102	83	68	50	36
1	393.06	258	242	231	161	103	85	69	52	37
2	379.49	259	243	234	166	113	97	82	65	50
3	367.70	259	244	235	170	120	105	91	75	60
4	357.29	259	244	235	172	125	111	97	82	68
5	348.30	258	244	235	174	130	116	102	87	75
6	339.03	258	244	235	176	133	120	107	92	80
7	331.00	257	243	235	178	136	124	111	96	84
8	323.52	257	243	235	179	139	127	114	99	88
9	316.46	256	242	234	180	141	130	117	102	91
10	310.56	255	242	234	180	143	132	119	105	94
20	255.61	245	233	226	182	152	143	133	120	109
30	214.52	235	225	219	182	157	150	141	131	122
40	183.32	227	218	213	180	159	153	145	137	129
50	157.90	219	211	206	178	160	154	148	140	133
60	138.15	212	205	201	176	159	155	149	142	136
70	122.25	206	199	196	173	159	155	149	143	138
80	109.37	201	194	191	171	158	154	149	143	139
90	99.33	196	190	187	169	157	153	149	143	139
100	90.35	192	187	184	167	156	152	148	143	139
200	51.61	173	169	167	157	150	148	146	143	140
300	38.89	164	161	159	152	146	145	143	140	138
400	31.79	159	156	155	149	144	143	141	139	137
500	27.23	155	153	152	146	142	141	140	138	137
600	23.69	152	149	149	144	140	139	138	137	135
700	31.02	149	147	146	142	139	138	136	135	134
800	18.76	146	144	144	140	137	136	135	134	133
900	16.96	144	142	142	138	136	135	134	133	132
1000	15.49	142	140	140	137	134	134	133	132	131

44 BWR UCF MOX

100 MTU/acre with 16.2m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpin
0	255.60	186	171	162	69	26	26	26	26
0.1	255.10	209	195	188	98	71	48	30	26
0.2	254.60	214	201	194	105	79	57	36	27
0.3	254.10	218	205	197	109	85	62	40	27
0.4	253.60	220	207	200	113	89	66	44	29
0.5	253.10	222	209	202	116	92	70	47	30
0.6	252.60	224	211	204	118	95	73	49	32
0.7	252.10	226	213	206	120	97	75	52	34
0.8	251.70	227	214	207	122	100	78	54	36
0.9	251.20	228	215	208	123	102	80	56	38
1	250.70	229	216	209	125	103	82	58	40
2	246.00	236	224	217	135	116	95	73	55
3	241.40	240	228	222	142	124	104	84	67
4	237.00	243	231	225	147	131	111	91	75
5	232.70	245	234	228	152	136	117	97	82
6	228.60	247	236	230	156	141	122	102	88
7	224.60	248	237	232	159	145	127	106	92
8	220.70	249	238	233	162	148	130	110	95
9	216.90	249	239	234	164	151	133	113	97
10	213.30	249	239	234	166	153	136	116	99
20	182.60	249	240	235	177	167	154	138	125
30	160.00	247	239	236	185	177	165	152	141
40	143.10	244	236	233	188	181	171	160	150
50	130.30	239	233	230	188	182	174	164	155
60	120.30	236	229	226	188	183	175	166	159
70	112.50	232	226	223	187	182	175	167	161
80	106.10	228	222	220	186	181	175	168	162
90	100.80	225	219	217	184	180	174	168	162
100	96.34	222	216	214	183	179	174	168	162
200	69.87	205	201	199	176	174	170	166	163
300	55.34	194	190	189	171	169	166	163	160
400	46.03	188	184	183	168	166	164	161	159
500	39.82	183	180	179	166	164	162	160	158
600	35.46	179	177	176	164	162	161	159	157
700	32.26	176	173	172	161	160	159	157	155
800	29.78	172	170	169	159	158	156	155	153
900	27.76	169	167	166	156	155	154	153	151
1000	26.04	166	164	163	154	153	152	151	149

44 BWR UCF

100 MTU/acre with 16.2m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	245	225	217	69	26	26	26	26
0.1	407.68	265	246	239	98	71	48	30	26
0.2	405.97	269	250	244	105	79	57	36	27
0.3	404.28	272	253	247	109	85	62	40	27
0.4	402.61	274	255	249	113	89	66	44	29
0.5	400.97	275	257	250	116	92	70	47	30
0.6	399.34	276	258	252	118	95	73	49	32
0.7	397.74	277	259	253	120	97	75	52	34
0.8	396.16	278	260	254	122	100	78	54	36
0.9	394.60	279	261	255	123	102	80	56	38
1	393.06	279	261	255	125	103	82	58	40
2	379.49	282	265	260	135	116	95	73	55
3	367.70	284	267	262	142	124	104	84	67
4	357.29	284	268	263	147	131	111	91	75
5	348.30	285	269	264	152	136	117	97	82
6	339.03	285	269	265	156	141	122	102	88
7	331.00	285	270	265	159	145	127	106	92
8	323.52	285	270	265	162	148	130	110	95
9	316.46	284	269	265	164	151	133	113	97
10	310.56	283	269	264	166	153	136	116	99
20	255.61	274	262	258	177	167	154	138	125
30	214.52	267	256	253	185	177	165	152	141
40	183.32	258	248	246	188	181	171	160	150
50	157.90	250	241	239	188	182	174	164	155
60	138.15	243	234	232	188	183	175	166	159
70	122.25	236	229	227	187	182	175	167	161
80	109.37	230	223	221	186	181	175	168	162
90	99.33	225	218	217	184	180	174	168	162
100	90.35	220	214	213	183	179	174	168	162
200	51.61	198	194	193	176	174	170	166	163
300	38.89	188	185	184	171	169	166	163	160
400	31.79	182	179	179	168	166	164	161	159
500	27.23	178	176	175	166	164	162	160	158
600	23.69	175	172	172	164	162	161	159	157
700	31.02	171	169	169	161	160	159	157	155
800	18.76	167	166	165	159	158	156	155	153
900	16.96	164	163	162	156	155	154	153	151
1000	15.49	161	160	159	154	153	152	151	149

44 BWR UCF MOX

83 MTU/acre with 19.5m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln	
0	255.60	185	171	162	69	26	26	26	26	
0.1	255.10	207	194	186	97	69	47	30	26	
0.2	254.60	212	199	191	102	76	55	35	27	
0.3	254.10	215	202	194	106	81	60	39	27	
0.4	253.60	217	204	196	109	84	63	42	29	
0.5	253.10	219	206	198	111	87	66	45	30	
0.6	252.60	220	207	200	113	89	69	47	32	
0.7	252.10	221	208	201	114	91	71	49	33	
0.8	251.70	222	209	202	116	93	73	51	35	
0.9	251.20	223	210	203	117	95	74	53	36	
1	250.70	224	211	204	118	96	76	55	38	
2	246.00	229	217	210	127	107	88	67	51	
3	241.40	233	221	214	134	115	96	77	61	
4	237.00	235	223	217	138	120	102	84	69	
5	232.70	236	225	219	142	125	107	89	75	
6	228.60	237	226	220	145	129	112	94	80	
7	224.60	238	227	222	148	132	115	98	85	
8	220.70	239	228	223	150	135	119	101	89	
9	216.90	239	228	223	152	137	121	104	92	
10	213.30	239	228	223	153	139	123	106	94	
20	182.60	234	224	220	160	149	136	122	109	
30	160.00	229	220	216	164	155	144	132	122	
40	143.10	223	215	212	165	157	148	138	129	
50	130.30	218	211	207	165	158	150	141	134	
60	120.30	214	207	204	164	158	151	143	136	
70	112.50	210	203	200	163	158	151	144	138	
80	106.10	206	200	197	162	156	151	144	139	
90	100.80	203	197	194	160	156	150	144	139	
100	96.34	200	194	191	159	155	150	144	139	
200	69.87	183	178	176	152	150	146	143	140	
300	55.34	173	169	167	148	146	143	141	138	
400	46.03	167	163	162	146	144	142	139	138	
500	39.82	162	159	158	144	142	140	138	137	
600	35.46	158	155	154	142	140	139	137	135	
700	32.26	155	152	151	140	138	137	135	134	
800	29.78	152	149	148	138	137	135	134	133	
900	27.76	150	147	146	136	135	134	133	132	
1000	26.04	148	145	144	135	134	133	132	131	

44 BWR UCF

83 MTU/acre with 19.5m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)						
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln	
0	409.42	245	224	216	69	26	26	26	26	
0.1	407.68	264	244	237	97	69	47	30	26	
0.2	405.97	268	248	242	102	76	55	35	27	
0.3	404.28	270	251	244	106	81	60	39	27	
0.4	402.61	271	252	246	109	84	63	42	29	
0.5	400.97	272	253	247	111	87	66	45	30	
0.6	399.34	273	254	248	113	89	69	47	32	
0.7	397.74	273	255	249	114	91	71	49	33	
0.8	396.16	274	256	249	116	93	73	51	35	
0.9	394.60	274	256	250	117	95	74	53	36	
1	393.06	275	257	250	118	96	76	55	38	
2	379.49	277	259	253	127	107	88	67	51	
3	367.70	277	260	255	134	115	96	77	61	
4	357.29	277	261	255	138	120	102	84	69	
5	348.30	277	261	256	142	125	107	89	75	
6	339.03	277	261	256	145	129	112	94	80	
7	331.00	276	260	255	148	132	115	98	85	
8	323.52	275	260	255	150	135	119	101	89	
9	316.46	274	259	254	152	137	121	104	92	
10	310.56	273	258	254	153	139	123	106	94	
20	255.61	260	247	243	160	149	136	122	109	
30	214.52	249	237	234	164	155	144	132	122	
40	183.32	239	228	225	165	157	148	138	129	
50	157.90	229	220	217	165	158	150	141	134	
60	138.15	221	213	210	164	158	151	143	136	
70	122.25	215	206	204	163	158	151	144	138	
80	109.37	208	201	199	162	156	151	144	139	
90	99.33	203	196	194	160	156	150	144	139	
100	90.35	198	192	190	159	155	150	144	139	
200	51.61	176	172	170	152	150	146	143	140	
300	38.89	166	163	162	148	146	143	141	138	
400	31.79	161	158	157	146	144	142	139	138	
500	27.23	157	154	154	144	142	140	138	137	
600	23.69	153	151	150	142	140	139	137	135	
700	31.02	150	148	147	140	138	137	135	134	
800	18.76	147	145	145	138	137	135	134	133	
900	16.96	145	143	143	136	135	134	133	132	
1000	15.49	143	141	141	135	134	133	132	131	

24 BWR UCF MOX

100 MTU/acre with 9.2m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	149	131	122	58	26	26	26	26
0.1	255.10	169	153	144	83	60	43	29	26
0.2	254.60	175	159	151	90	68	51	34	26
0.3	254.10	179	163	155	94	74	56	38	27
0.4	253.60	182	166	158	98	79	61	42	29
0.5	253.10	184	169	161	101	82	64	45	30
0.6	252.60	186	171	163	104	85	67	47	32
0.7	252.10	188	173	165	106	88	70	50	34
0.8	251.70	190	174	167	108	90	72	52	36
0.9	251.20	191	176	169	110	92	75	54	37
1	250.70	192	177	170	112	94	77	56	39
2	246.00	201	186	180	123	108	91	72	55
3	241.40	206	192	185	131	116	100	82	66
4	237.00	210	196	190	137	123	107	90	75
5	232.70	213	200	194	142	129	113	96	82
6	228.60	215	203	197	146	134	119	101	87
7	224.60	217	205	199	150	138	123	105	92
8	220.70	219	207	201	153	142	127	109	95
9	216.90	220	208	203	155	145	130	112	97
10	213.30	221	209	204	157	147	132	115	99
20	182.60	224	214	210	171	163	151	137	125
30	160.00	226	218	214	180	173	163	151	141
40	143.10	225	217	213	183	178	169	159	150
50	130.30	222	215	212	184	180	172	163	155
60	120.30	220	213	210	184	180	174	166	158
70	112.50	217	211	208	184	180	174	167	160
80	106.10	214	208	205	183	179	174	167	161
90	100.80	212	206	203	182	179	173	167	162
100	96.34	210	204	201	180	178	173	167	162
200	69.87	196	191	189	174	172	169	166	163
300	55.34	187	183	181	169	168	165	163	160
400	46.03	181	178	177	166	165	163	161	159
500	39.82	178	175	173	165	164	162	160	158
600	35.46	174	172	171	163	162	160	158	157
700	32.26	171	169	168	160	159	158	157	155
800	29.78	168	165	164	158	157	156	154	153
900	27.76	165	163	162	155	155	154	152	151
1000	26.04	162	160	159	153	153	152	150	149

24 BWR UCF

100 MTU/acre with 9.2m WP Spacing

10 year old, 49 GWd/MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	189	160	153	58	26	26	26	26
0.1	407.68	207	180	174	83	60	43	29	26
0.2	405.97	212	186	180	90	68	51	34	26
0.3	404.28	216	190	184	94	74	56	38	27
0.4	402.61	218	192	186	98	79	61	42	29
0.5	400.97	220	195	189	101	82	64	45	30
0.6	399.34	221	196	191	104	85	67	47	32
0.7	397.74	223	198	192	106	88	70	50	34
0.8	396.16	224	199	194	108	90	72	52	36
0.9	394.60	225	201	195	110	92	75	54	37
1	393.06	226	202	196	112	94	77	56	39
2	379.49	231	209	203	123	108	91	72	55
3	367.70	234	213	207	131	116	100	82	66
4	357.29	236	216	210	137	123	107	90	75
5	348.30	238	218	213	142	129	113	96	82
6	339.03	240	220	215	146	134	119	101	87
7	331.00	241	222	217	150	138	123	105	92
8	323.52	241	223	218	153	142	127	109	95
9	316.46	241	223	219	155	145	130	112	97
10	310.56	242	224	219	157	147	132	115	99
20	255.61	240	225	221	171	163	151	137	125
30	214.52	238	225	222	180	173	163	151	141
40	183.32	233	222	219	183	178	169	159	150
50	157.90	228	218	215	184	180	172	163	155
60	138.15	223	214	212	184	180	174	166	158
70	122.25	218	210	208	184	180	174	167	160
80	109.37	214	206	204	183	179	174	167	161
90	99.33	210	203	201	182	179	173	167	162
100	90.35	207	200	199	180	178	173	167	162
200	51.61	190	186	185	174	172	169	166	163
300	38.89	181	178	177	169	168	165	163	160
400	31.79	176	174	173	166	165	163	161	159
500	27.23	173	171	170	165	164	162	160	158
600	23.69	170	168	168	163	162	160	158	157
700	31.02	167	165	165	160	159	158	157	155
800	18.76	164	162	162	158	157	156	154	153
900	16.96	161	159	159	155	155	154	152	151
1000	15.49	159	157	157	153	153	152	150	149

24 BWR UCF MOX

83 MTU/acre with 11.1m WP Spacing

10 year old, 37.6 MWd/kgHM burnup MOX SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	255.60	149	131	121	57	26	26	26	57
0.1	255.10	167	150	142	79	57	41	29	79
0.2	254.60	172	155	147	85	64	48	33	85
0.3	254.10	175	158	150	89	68	53	37	89
0.4	253.60	177	161	153	92	72	56	39	92
0.5	253.10	179	163	155	95	75	59	42	95
0.6	252.60	181	165	157	97	78	62	44	97
0.7	252.10	182	166	159	99	80	64	46	99
0.8	251.70	183	168	160	100	82	66	48	100
0.9	251.20	184	169	161	102	83	68	50	102
1	250.70	185	170	162	103	85	69	52	103
2	246.00	193	178	171	113	97	82	65	113
3	241.40	197	183	176	120	105	91	75	120
4	237.00	200	186	180	125	111	97	82	125
5	232.70	202	189	183	130	116	102	87	130
6	228.60	204	191	185	133	120	107	92	133
7	224.60	206	193	187	136	124	111	96	136
8	220.70	207	195	189	139	127	114	99	139
9	216.90	208	195	190	141	130	117	102	141
10	213.30	208	196	190	143	132	119	105	143
20	182.60	208	197	192	152	143	133	120	152
30	160.00	206	196	192	157	150	141	131	157
40	143.10	203	194	191	159	153	145	137	159
50	130.30	200	192	188	160	154	148	140	160
60	120.30	197	189	186	159	155	149	142	159
70	112.50	194	187	184	159	155	149	143	159
80	106.10	191	184	181	158	154	149	143	158
90	100.80	189	182	179	157	153	149	143	157
100	96.34	187	180	177	156	152	148	143	156
200	69.87	173	168	166	150	148	146	143	150
300	55.34	165	161	159	146	145	143	140	146
400	46.03	160	156	155	144	143	141	139	144
500	39.82	156	153	152	142	141	140	138	142
600	35.46	153	150	149	140	139	138	137	140
700	32.26	150	147	146	139	138	136	135	139
800	29.78	148	145	144	137	136	135	134	137
900	27.76	146	143	142	136	135	134	133	136
1000	26.04	144	141	140	134	134	133	132	134

24 BWR UCF

83 MTU/acre with 11.1m WP Spacing

10 year old, 49 GWd/ MTU burnup SNF

Time (years)	Heat Load (W/assy)	Wooten-E Pk Fuel (Deg. C)	Eff Cond Pk Fuel (Deg. C)	ANSYS FEM Temperature Results (Deg. C)					
				Basket	WP Side	Drift Wall	1m Rock	3m Rock	Df Midpln
0	409.42	189	159	153	57	26	26	26	57
0.1	407.68	205	178	171	79	57	41	29	79
0.2	405.97	209	182	176	85	64	48	33	85
0.3	404.28	212	185	179	89	68	53	37	89
0.4	402.61	213	187	181	92	72	56	39	92
0.5	400.97	215	189	183	95	75	59	42	95
0.6	399.34	216	191	185	97	78	62	44	97
0.7	397.74	217	192	186	99	80	64	46	99
0.8	396.16	218	193	187	100	82	66	48	100
0.9	394.60	219	194	188	102	83	68	50	102
1	393.06	219	195	189	103	85	69	52	103
2	379.49	224	201	195	113	97	82	65	113
3	367.70	226	204	198	120	105	91	75	120
4	357.29	228	206	201	125	111	97	82	125
5	348.30	229	208	203	130	116	102	87	130
6	339.03	229	209	204	133	120	107	92	133
7	331.00	230	210	205	136	124	111	96	136
8	323.52	230	211	206	139	127	114	99	139
9	316.46	230	211	206	141	130	117	102	141
10	310.56	230	211	207	143	132	119	105	143
20	255.61	224	208	204	152	143	133	120	152
30	214.52	218	204	201	157	150	141	131	157
40	183.32	212	199	197	159	153	145	137	159
50	157.90	206	195	192	160	154	148	140	160
60	138.15	200	190	188	159	155	149	142	159
70	122.25	195	186	184	159	155	149	143	159
80	109.37	191	182	180	158	154	149	143	158
90	99.33	187	179	177	157	153	149	143	157
100	90.35	184	176	175	156	152	148	143	156
200	51.61	167	162	161	150	148	146	143	150
300	38.89	159	155	155	146	145	143	140	146
400	31.79	155	152	151	144	143	141	139	144
500	27.23	152	149	148	142	141	140	138	142
600	23.69	149	146	146	140	139	138	137	140
700	31.02	146	144	143	139	138	136	135	139
800	18.76	144	142	141	137	136	135	134	137
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*SET,WPTOP ( 2, 1, 1), 78.63775956664
*SET,WPTOP ( 3, 1, 1), 84.56889878875
*SET,WPTOP ( 4, 1, 1), 88.47078243442
*SET,WPTOP ( 5, 1, 1), 91.48402267324
*SET,WPTOP ( 6, 1, 1), 93.95005466988
*SET,WPTOP ( 7, 1, 1), 96.04860064928
*SET,WPTOP ( 8, 1, 1), 97.88486857101
*SET,WPTOP ( 9, 1, 1), 99.53264581081
*SET,WPTOP ( 10, 1, 1), 101.0266169561
*SET,WPTOP ( 11, 1, 1), 102.4079433699
*SET,WPTOP ( 12, 1, 1), 112.8035127756
*SET,WPTOP ( 13, 1, 1), 119.7137662441
*SET,WPTOP ( 14, 1, 1), 124.8445336133
*SET,WPTOP ( 15, 1, 1), 128.9795687170
*SET,WPTOP ( 16, 1, 1), 132.5217868010
*SET,WPTOP ( 17, 1, 1), 135.6359134114
*SET,WPTOP ( 18, 1, 1), 138.4387258163
*SET,WPTOP ( 19, 1, 1), 140.3714859673
*SET,WPTOP ( 20, 1, 1), 142.1073462720
*SET,WPTOP ( 21, 1, 1), 151.5106448660
*SET,WPTOP ( 22, 1, 1), 156.5271833545
*SET,WPTOP ( 23, 1, 1), 158.6781786918
*SET,WPTOP ( 24, 1, 1), 159.3408366813
*SET,WPTOP ( 25, 1, 1), 159.1502370774
*SET,WPTOP ( 26, 1, 1), 158.6856661328
*SET,WPTOP ( 27, 1, 1), 157.5246091572
*SET,WPTOP ( 28, 1, 1), 156.5152865537
*SET,WPTOP ( 29, 1, 1), 155.6214746956
*SET,WPTOP ( 30, 1, 1), 150.0736161666
*SET,WPTOP ( 31, 1, 1), 146.3236458706
*SET,WPTOP ( 32, 1, 1), 144.1800260920
*SET,WPTOP ( 33, 1, 1), 142.4128344084
*SET,WPTOP ( 34, 1, 1), 140.4054519418
*SET,WPTOP ( 35, 1, 1), 138.5928196914
*SET,WPTOP ( 36, 1, 1), 136.9901676978
*SET,WPTOP ( 37, 1, 1), 135.5444252831
*SET,WPTOP ( 38, 1, 1), 134.2749621531
*SET,WPVOL , 7.573151546382
*SET,WPVLL , .10000000000000
*SET,XXX , 1.734935157290
*SET,YYY , -1.527450000000
/GOPR

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W E L C O M E T O T H E A N S Y S P R O G R A M

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***** ANSYS COMMAND LINE ARGUMENTS *****

INITIAL JOBNAME = mpc40mxx
MEMORY REQUESTED (MB) = 64.0
BATCH MODE REQUESTED = LIST
START-UP FILE MODE = READ

*** NOTE *** CP= 0.140 TIME= 09:22:26
There are no parameters and no abbreviations defined.

38303 VERSION=HP 9000/7XX REVISION= 5.1 24
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844
CURRENT JOBNAME=mpc40mxx 09:22:26 JUN 26, 1996 CP= 0.150

```

1 /COM, *****
2 /COM, ANSYS REVISION 5.1 06/24/1996
3 /COM, 2-D Model 40 BWR MOX MPC Thermal Analysis H.Wang
4 /COM, *****
5 /COM, *
6 /COM, * File name: 40moxmpc.inp
7 /COM, * 40 BWR MPC with High T.L. Disposal Container
8 /COM, * Helium Fill Gas
9 /COM, *
10 /COM, * Material Property file: props01.dat
11 /COM, *
12 /COM, * BWR SNF Conductivity file: bwr8ke.dat
13 /COM, * GE-5 8x8 SNF Assembly
14 /COM, *
15 /COM, * SNF Heat Loads file: bwrmox1.dat
16 /COM, * SNF Type: 10 years old, 37.6 GWD/MTU
17 /COM, *
18 /COM, * Surface Temp. file: c21x5a.parm
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 /CONFIG,nvpag,512,
27 /COM, Work space must also be increased (-m 64)
28 /COM, *****
29 /TITLE, 40 BWR MPC/Waste Package with 10 yr old, MOX SNF
30 /UNITS,SI,
31 /COM, *****
32 /COM, Define Transient time parameters
33 /COM, TM_START = start time (sec)
34 /COM, TMI* = time increment for solution (sec)
35 /COM, TME* = start and stop for time do-loops (sec)
36 /COM, Note: 1 year = 3.15576e7 seconds
37 /COM, TMTMAX = time of maximum cladding temperature
38 TM_START=(1.0E-6)*(3.15576E7)
39 TMI0=0.1*3.15576E7
40 TMI1=1.0*3.15576E7
41 TMI10=10.0*3.15576E7
42 TMI100=100.0*3.15576E7
43 TMI1000=1000.0*3.15576E7
44 TME0=0.9*3.15576E7+TM_START
45 TME1=TMI1+TM_START
46 TME9=9.0*3.15576E7+TM_START
47 TME10=TMI10+TM_START
48 TME50=50.0*3.15576E7+TM_START
49 TME90=90.0*3.15576E7+TM_START
50 TME100=TMI100+TM_START

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```

51 TME1000=TMI1000+TM_START
52 /COM,
53 /COM, *****
54 /COM,      Read in average effective conductivities from SNF model
55 /COM,PARRES,CHANGE,b8hel8c,parm,
56 /COM,      Read in surface temps. from repository model
57 PARRES,CHANGE,c21x5a,parm,
58 /COM, *****
59 /COM,      Define MPC/waste package parameters
60 /COM,      (MPC dimensions converted from inches to meters)
61 /COM,      Required Constants:
62 /COM,
63 PI=3.141592654
64 /COM,
65 /COM,      Required container wall parameters:
66 /COM,      MIRAD = inner radius of MPC shell (m)
67 /COM,      MWALL = MPC shell thickness (m)
68 /COM,      DCRAD = disposal container outer radius (m)
69 /COM,      OWALL = outer barrier thickness (m)
70 /COM,      IWALL = inner barrier thickness (m)
71 MIRAD=58.300*2.54/100.0/2.0
72 MWALL=1.0000*2.54/100.0
73 DCRAD=1.8016/2.0
74 OWALL=0.1000
75 IWALL=0.0200
76 /COM,
77 /COM,      Required outer guide hardware parameters:
78 /COM,      Set 1:      TPGPL = top/bottom guide plate length (m)
79 /COM,      TPGPT = top/bottom guide plate thickness (m)
80 TPGPL=6.3240*2.54/100.0
81 TPGPT=0.2500*2.54/100.0
82 /COM,
83 /COM,      Set 2:      SGCCW = Width; corner guide to far corner side guide (m)
84 /COM,      SGCMW = Width; Side guide corner to Middle side guide (m)
85 /COM,      SGCD1 = Vert. Dist. Down to Corner of Guide (m)
86 SGCCW=21.132*2.54/100.0
87 SGCMW=6.7810*2.54/100.0
88 SGCD1=6.9790*2.54/100.0
89 /COM,
90 /COM,      SET 3:      GCORV = corner guide Vertical width (m)
91 /COM,      GCORH = corner guide Horizontal width (m)
92 /COM,      GX32 = X coord. of upper contact from drawing. (m)
93 /COM,      GY32 = Y coord. of upper contact from drawing. (m)
94 GCORV=7.7600*2.54/100.0
95 GCORH=6.7160*2.54/100.0
96 GX32=18.66137525*2.54/100.0
97 GY32=22.39365030*2.54/100.0
98 /COM,
99 /COM,      SET 4:      GLEN1 = side guide Low width (m)
100 /COM,      GLEN2 = side guide High width (m)
101 /COM,      GLENT = side guide total width (m)
102 /COM,      GWALL = guide thickness (m)
103 GLEN1=6.7290*2.54/100.0
104 GLEN2=13.937*2.54/100.0
105 GLENT=28.866*2.54/100.0
106 GWALL=0.3750*2.54/100.0
107 /COM,
108 /COM,      Required Tube/Fuel parameters:
109 /COM,      HCELL = 1/2 of basket cell opening (m)
110 /COM,      SWALL = stainless tube thickness (m)
111 /COM,      AWALL = Al/boron tube thickness (m)
112 /COM,      TWALL = stainless tube cladding thickness (m)
113 /COM,      ACTVL = active fuel length
114 /COM,      PEAKF = assembly heat axial peaking factor
115 HCELL=6.0000*2.54/100.0/2.0
116 SWALL=0.2500*2.54/100.0
117 AWALL=0.2500*2.54/100.0
118 TWALL=0.0940*2.54/100.0
119 ACTVL=150.00*2.54/100.0
120 PEAKF=1.40

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121 /COM,
122 /COM, *****
123 /COM, Define calculated parameters
124 /COM, ASSY = assembly heat production (W) f(yrs)
125 /COM, FUEL = volumetric heat production (W/m3) f(yrs)
126 /COM, FVOLUME = assy_volume=cell_width^2*active_length
127 /COM, PITCH = basket cell outer width (m)
128 /COM, QCELL = 1/4 of basket cell opening (m)
129 /COM, SCELL = 1/2 of basket cell opening+SS wall(m)
130 /COM, ACELL = 1/2 of basket cell opening+SS+AL (m)
131 /COM, ATWCL = Dist. to edge of B-AL plate (m)
132 /COM, STWCL = Dist. to edge of Steel Bask. Plate (m)
133 /COM, TQPCL = Top quarter of cell dist. (m)
134 *SET, ASSY,
135 *DIM, ASSY, TABLE, 101, 1,
136 *DIM, FUEL, TABLE, 101, 1
137 FVOLUME=4*HCELL*HCELL*ACTVL
138 PITCH=(HCELL+SWALL+AWALL+TWALL)*2.0
139 QCELL=HCELL/2.0
140 SCELL=HCELL+SWALL
141 ACELL=HCELL+SWALL+AWALL
142 ATWCL=TWALL+AWALL
143 STWCL=TWALL+AWALL+SWALL
144 TQPCL=STWCL+QCELL
145 /COM,
146 /COM, *****
147 /COM, Determine the required contact points for the outer guide hardware
148 /COM, GX## = x coord. of guide/shell contact
149 /COM, GY## = y coord. of guide/shell contact
150 /COM, Set 1:
151 GX11=TPGPL/2.0
152 GY11=SQRT(MIRAD*MIRAD - GX11*GX11)
153 /COM,
154 /COM, Set 3:
155 GX31=GX32+GCORH-GWALL
156 GY31=GY32-GCORV+GWALL
157 /COM,
158 /COM, Set 2:
159 GX24=GX31-SGCCW
160 GY24=SQRT(MIRAD*MIRAD-GX24*GX24)
161 GX23=GX24+GWALL
162 GY23=SQRT(MIRAD*MIRAD-GX23*GX23)
163 GX22=GX24+SGCMW
164 GY22=SQRT(MIRAD*MIRAD-GX22*GX22)
165 GX21=GX22+GWALL
166 GY21=SQRT(MIRAD*MIRAD-GX21*GX21)
167 /COM,
168 /COM, Set 4:
169 GY41=GWALL/2.0
170 GX41=SQRT(MIRAD*MIRAD - GY41*GY41)
171 GY44=GY41+GLEN2
172 GX44=SQRT(MIRAD*MIRAD - GY44*GY44)
173 GY43=GY44-GLEN1
174 GX43=SQRT(MIRAD*MIRAD - GY43*GY43)
175 GY42=GY43-GWALL
176 GX42=SQRT(MIRAD*MIRAD - GY42*GY42)
177 /COM,
178 /COM, Define 45 degree point of reference:
179 /COM, MI45 = x coord. MIRAD at 45 deg.
180 /COM, MO45 = x coord. MIRAD+MWALL at 45 deg.
181 /COM, DI45 = x coord. DCRAD-OWALL-IWALL at 45 deg.
182 /COM, DM45 = x coord. DCRAD-OWALL at 45 deg.
183 /COM, DO45 = x coord. DCRAD at 45 deg.
184 /COM, OFFS = 45 degree Y off set to go through centers
185 MI45=MIRAD/SQRT(2.0)
186 MO45=(MIRAD+MWALL)/SQRT(2.0)
187 DI45=(DCRAD-OWALL-IWALL)/SQRT(2.0)
188 DM45=(DCRAD-OWALL)/SQRT(2.0)
189 DO45=DCRAD/SQRT(2.0)
190 OFFS=0.5*PITCH

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191 /COM,
192 /COM, *****
193 /COM, Define different element types
194 /PREP7
195 ETYPE
196 ET, 1,55,
197 ET, 2,70,
198 ET, 7,32,
199 ET, 16,57,
200 ET, 17,32,
201 ET, 18,50,1,
202 ET, 19,31,
203 ET, 27,32,
204 /COM, *****
205 /COM, File props01.dat describes material properties
206 /COM, and thier reference numbers
207 MPREAD,props01,dat,
208 /COM, Read in single assembly heat loads
209 /COM, Calculate the volumetric heat generation
210 /COM, (Assembly time is in years, FUEL is in seconds)
211 /INPUT,bwrmox1,dat
212 *VFACT,3.15576E7,
213 *MFUN,FUEL(1,0),COPY,ASSY(1,0),
214 *VFACT,(PEAKF/FVOLUME),
215 *VFUN,FUEL(1),COPY,ASSY(1),
216 FUEL(0,1)=1.0
217 /COM, *****
218 /COM, Define new material 14 for SNF effective conductivity
219 /COM,
220 /COM, BWR 8x8 pin array with a channel in a Helium Environment
221 /COM, Density: DENS (kg/m^3)
222 /COM, Conductivity: KXX (W/m/K)
223 /COM, Specific Heat: C (J/kg/K)
224 MPTEMP
225 MPTEMP, 1, .00000E+00,
226 MPDATA,DENS,14, 1, .388242E+04,
227 MPDATA, C,14, 1, .273129E+03,
228 /COM, Store average effective conductivities
229 MPTEMP
230 MPTEMP, 1, 25.0, 50.0, 75.0, 100.0, 125.0, 150.0,
231 MPTEMP, 7, 175.0, 200.0, 225.0, 250.0, 275.0, 300.0,
232 MPTEMP, 13, 325.0, 350.0, 375.0, 400.0,
233 MPDATA, KXX,14, 1, 0.297, 0.325, 0.355, 0.389, 0.426, 0.466,
234 MPDATA, KXX,14, 7, 0.509, 0.555, 0.604, 0.656,
235 /COM, *****
236 /COM, Construct geometry for Disposal Container
237 /COM,
238 /COM, Define center and axis keypoints for waste package
239 /COM, Also, create placeholder keypoints and lines
240 /COM, (K's 1,2,3,4,5,6,7,8)
241 /COM, (L's 1,2,3,4)
242 K,1,0.0,0.0,0.0,
243 K,2,0.0,0.0,1.0,
244 K,3,0.0,0.0,1.3,
245 K,4,0.0,0.0,1.4,
246 K,5,0.0,0.0,1.5,
247 K,6,0.0,0.0,1.6,
248 K,7,0.0,0.0,1.7,
249 K,8,0.0,0.0,1.8,
250 L,3,4,
251 L,4,5,
252 L,5,6,
253 L,6,7,
254 /COM, Define disposal container and MPC outer radius
255 /COM, (K's 9,10,11,12,13,14,15,16,17,18,19,20)
256 /COM, (L's 5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20)
257 /COM, (A's 1,2,3,4,5)
258 K, 9, 0.0, (0.0-DCRAD),0.0,
259 K,10, DCRAD, 0.0,0.0,
260 K,11, 0.0, DCRAD,0.0,

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261 K,12, 0.0, (OWALL-DCRAD),0.0,
262 K,13, (DCRAD-OWALL), 0.0,0.0,
263 K,14, 0.0, (DCRAD-OWALL),0.0,
264 K,15, 0.0,(OWALL+IWALL-DCRAD),0.0,
265 K,16,(DCRAD-OWALL-IWALL), 0.0,0.0,
266 K,17, 0.0,(DCRAD-OWALL-IWALL),0.0,
267 K,18, 0.0, (0.0-MIRAD-MWALL),0.0,
268 K,19, (MIRAD+MWALL), 0.0,0.0,
269 K,20, 0.0, (MIRAD+MWALL),0.0,
270 L,10,13,
271 L,13,16,
272 LARC,10, 9,1, DCRAD,
273 LARC,11,10,1, DCRAD,
274 LARC,13,12,1, (DCRAD-OWALL),
275 LARC,14,13,1, (DCRAD-OWALL),
276 L,11,14,
277 L, 9,12,
278 LARC,15,16,1,(DCRAD-OWALL-IWALL),
279 LARC,16,17,1,(DCRAD-OWALL-IWALL),
280 L,14,17,
281 L,12,15,
282 LARC,19,18,1, (MIRAD+MWALL),
283 LARC,20,19,1, (MIRAD+MWALL),
284 L,17,20,
285 L,15,18,
286 AL, 5, 7,12, 9,
287 AL,11, 8, 5,10,
288 AL, 6, 9,16,13,
289 AL,15,10, 6,14,
290 AL,19,14,13,20,17,18,
291 /COM, *****
292 /COM, Define MPC shell inner edge and area
293 /COM, (K's 21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37)
294 /COM, ( 38, 39, 40, 41, 42, 43, 44)
295 /COM, (L's 21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37)
296 /COM, ( 38,39, 40, 41, 42, 43, 44, 45)
297 /COM, (A's 6)
298 K,21, 0.0, MIRAD,0.0,
299 K,22, GX11, GY11,0.0,
300 K,23, GX24, GY24,0.0,
301 K,24, GX23, GY23,0.0,
302 K,25, GX22, GY22,0.0,
303 K,26, GX21, GY21,0.0,
304 K,27, GX32, GY32,0.0,
305 K,28, GX31, GY31,0.0,
306 K,29, GX44, GY44,0.0,
307 K,30, GX43, GY43,0.0,
308 K,31, GX42, GY42,0.0,
309 K,32, GX41, GY41,0.0,
310 K,33, GX41, (0.0-GY41),0.0,
311 K,34, GX42, (0.0-GY42),0.0,
312 K,35, GX43, (0.0-GY43),0.0,
313 K,36, GX44, (0.0-GY44),0.0,
314 K,37, GX31, (0.0-GY31),0.0,
315 K,38, GX32, (0.0-GY32),0.0,
316 K,39, GX21, (0.0-GY21),0.0,
317 K,40, GX22, (0.0-GY22),0.0,
318 K,41, GX23, (0.0-GY23),0.0,
319 K,42, GX24, (0.0-GY24),0.0,
320 K,43, GX11, (0.0-GY11),0.0,
321 K,44, 0.0,(0.0-MIRAD),0.0,
322 L,20,21,
323 LARC,22,21,1,MIRAD,
324 LARC,23,22,1,MIRAD,
325 LARC,24,23,1,MIRAD,
326 LARC,25,24,1,MIRAD,
327 LARC,26,25,1,MIRAD,
328 LARC,27,26,1,MIRAD,
329 LARC,28,27,1,MIRAD,
330 LARC,29,28,1,MIRAD,

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331 LARC,30,29,1,MIRAD,
332 LARC,31,30,1,MIRAD,
333 LARC,32,31,1,MIRAD,
334 LARC,33,32,1,MIRAD,
335 LARC,34,33,1,MIRAD,
336 LARC,35,34,1,MIRAD,
337 LARC,36,35,1,MIRAD,
338 LARC,37,36,1,MIRAD,
339 LARC,38,37,1,MIRAD,
340 LARC,39,38,1,MIRAD,
341 LARC,40,39,1,MIRAD,
342 LARC,41,40,1,MIRAD,
343 LARC,42,41,1,MIRAD,
344 LARC,43,42,1,MIRAD,
345 LARC,44,43,1,MIRAD,
346 L,18,44,
347 LSEL,S,LINE,,21,45,
348 LSEL,A,LINE,,17,18,
349 AL,ALL,
350 LSEL,ALL,
351 /COM, *****
352 /COM, Define tube guides
353 /COM, (K's 45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61)
354 /COM, ( 62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78)
355 /COM, ( 79,80,81,82)
356 /COM, (L's 46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62)
357 /COM, ( 63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79)
358 /COM, ( 80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96)
359 /COM, ( 97,98,99,100,101,102,103,104,105,106,107,108,109,110)
360 /COM, ( 111,112,113,114,115)
361 /COM, (A's 7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24)
362 /COM, ( 25,26,27,28,29,30,31,32,33,34,35,36,37,38)
363 /COM,
364 /COM, Set 1: top plate
365 K,45, GX11, (GY11-GWALL),0.0,
366 K,46, 0.0, GY11,0.0,
367 K,47, 0.0, (GY11-GWALL),0.0,
368 /COM,
369 /COM, Set 2: top side guide
370 K,48, GX24, (GY24-SGCD1),0.0,
371 K,49, GX23, (GY24-SGCD1+GWALL),0.0,
372 K,50, GX22, (GY24-SGCD1+GWALL),0.0,
373 K,51, GX21, (GY24-SGCD1+GWALL),0.0,
374 K,52, (GX32-GWALL), (GY24-SGCD1+GWALL),0.0,
375 K,53, (GX32-GWALL), (GY24-SGCD1),0.0,
376 K,54, GX32, (GY24-SGCD1+GWALL),0.0,
377 K,55, GX32, (GY24-SGCD1),0.0,
378 /COM,
379 /COM, Set 3: top corner
380 K,56, (GX32-GWALL), GY32,0.0,
381 K,57, (GX32-GWALL), (GY32-GCORV),0.0,
382 K,58, GX32, (GY32-GCORV+GWALL),0.0,
383 K,59, GX31, (GY31-GWALL),0.0,
384 /COM,
385 /COM, Set 4: side guide
386 K,60, (GX44-GWALL), GY44,0.0,
387 K,61, (GX44-GWALL), (0.0-GY44),0.0,
388 K,62, GX44, GY43,0.0,
389 K,63, GX44, GY42,0.0,
390 K,64, GX44, GY41,0.0,
391 K,65, GX44, (0.0-GY41),0.0,
392 K,66, GX44, (0.0-GY42),0.0,
393 K,67, GX44, (0.0-GY43),0.0,
394 /COM,
395 /COM, Set 3: bottom corner
396 K,68, (GX32-GWALL), (0.0-GY32),0.0,
397 K,69, (GX32-GWALL), (0.0-GY32+GCORV),0.0,
398 K,70, GX32, (0.0-GY32+GCORV-GWALL),0.0,
399 K,71, GX31, (0.0-GY31+GWALL),0.0,
400 /COM,

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401 /COM,          Set 2: bottom side guide
402 K,72,          GX24,          (0.0-GY24+SGCD1),0.0,
403 K,73,          GX23,(0.0-GY24+SGCD1-GWALL),0.0,
404 K,74,          GX22,(0.0-GY24+SGCD1-GWALL),0.0,
405 K,75,          GX21,(0.0-GY24+SGCD1-GWALL),0.0,
406 K,76,(GX32-GWALL),(0.0-GY24+SGCD1-GWALL),0.0,
407 K,77,(GX32-GWALL),          (0.0-GY24+SGCD1),0.0,
408 K,78,          GX32,(0.0-GY24+SGCD1-GWALL),0.0,
409 K,79,          GX32,          (0.0-GY24+SGCD1),0.0,
410 /COM,
411 /COM,          Set 1: bottom plate
412 K,80,          GX11,          (0.0-GY11+GWALL),0.0,
413 K,81,          0.0,          (0.0-GY11),0.0,
414 K,82,          0.0,          (0.0-GY11+GWALL),0.0,
415 /COM,
416 /COM,          Now Fill in the required lines:
417 /COM,          Set 1: bottom plate
418 L,21,46,
419 L,46,47,
420 L,46,22,
421 L,22,45,
422 L,45,47,
423 /COM,
424 /COM,          Set 2: top side guide
425 L,48,23,
426 L,48,49,
427 L,24,49,
428 L,49,50,
429 L,53,48,
430 L,50,25,
431 L,26,51,
432 L,50,51,
433 L,51,52,
434 L,52,53,
435 /COM,
436 /COM,          Set 3: top corner
437 L,56,27,
438 L,52,56,
439 L,27,54,
440 L,54,55,
441 L,52,54,
442 L,53,55,
443 L,55,58,
444 L,57,53,
445 L,57,58,
446 L,58,28,
447 L,59,57,
448 L,28,59,
449 /COM,
450 /COM,          Set 4: side guide
451 L,60,29,
452 L,61,60,
453 L,29,62,
454 L,62,63,
455 L,62,30,
456 L,31,63,
457 L,63,64,
458 L,64,65,
459 L,64,32,
460 L,33,65,
461 L,65,66,
462 L,66,67,
463 L,66,34,
464 L,35,67,
465 L,67,36,
466 L,36,61,
467 /COM,
468 /COM,          Set 3: bottom corner
469 L,37,71,
470 L,69,71,

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471 L,69,70,
472 L,37,70,
473 L,70,79,
474 L,79,78,
475 L,78,38,
476 L,38,68,
477 L,68,76,
478 L,76,77,
479 L,77,69,
480 L,76,78,
481 L,77,79,
482 /COM,
483 /COM,          Set 2: bottom side guide
484 L,72,77,
485 L,72,73,
486 L,76,75,
487 L,75,74,
488 L,74,73,
489 L,73,41,
490 L,42,72,
491 L,40,74,
492 L,75,39,
493 /COM,
494 /COM,          Set 1: bottom plate
495 L,80,43,
496 L,82,80,
497 L,82,81,
498 L,43,81,
499 L,81,44,
500 /COM,          Radiation/Back Fill Gas Gaps:
501 /COM,          Set 1: TOP
502 AL,46,48,22,
503 /COM,          Set 2: TOP
504 AL,25,53,54,56,
505 AL,27,57,59,62,61,
506 /COM,          Set 3: TOP
507 AL,28,63,64,67,70,
508 /COM,          Set 4: SIDE
509 AL,30,75,77,
510 AL,32,78,79,81,
511 AL,34,82,83,85,
512 AL,36,86,87,
513 /COM,          Set 3: BOTTOM
514 AL,38,92,93,94,95,
515 /COM,          Set 2: BOTTOM
516 AL,39,96,97,104,110,
517 AL,41,109,106,107,
518 /COM,          Set 1: BOTTOM
519 AL,44,114,115,
520 /COM,          SOLID GUIDES:
521 /COM,          Set 1: TOP
522 AL,47,48,49,50,
523 /COM,          Set 2: TOP
524 AL,24,51,52,53,
525 AL,52,55,60,59,58,54,
526 AL,26,56,58,57,
527 /COM,          Set 3: TOP
528 AL,61,62,65,63,
529 AL,65,60,66,64,
530 AL,66,68,69,67,
531 AL,70,69,71,72,
532 /COM,          Set 4: SIDE
533 AL,73,74,88,87,84,83,80,79,76,75,
534 AL,31,77,76,78,
535 AL,33,81,80,82,
536 AL,35,85,84,86,
537 /COM,          Set 3: BOTTOM
538 AL,89,90,91,92,
539 AL,91,93,101,99,
540 AL,101,94,100,98,

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541 AL,100,95,96,97,
542 /COM,          Set 2: BOTTOM
543 AL,102,98,104,105,106,103,
544 AL,40,110,105,109,
545 AL,42,107,103,108,
546 /COM,          Set 1: BOTTOM
547 AL,111,112,113,114,
548 /COM,          *****
549 /COM,          Define center edge half-tube
550 /COM,          (K's 83,84,85,86,87,88,89,90,91,92,93,94)
551 /COM,          (L's 116,117,118,119,120,121,122,123,124,125,126,127,128)
552 /COM,          ( 129,130,131,132,133)
553 /COM,          (A's 39,40,41,42,43,44,45)
554 K,83,          0.0,          TWALL,0.0,
555 K,84,          0.0,          (AWALL+TWALL),0.0,
556 K,85,          0.0,          (AWALL+SWALL+TWALL),0.0,
557 K,86,          0.0,          (AWALL+SWALL+TWALL+(2.0*HCELL)),0.0,
558 K,87,          0.0,          (AWALL+TWALL+(2.0*(SWALL+HCELL))),0.0,
559 K,88,          0.0,          (2.0*(AWALL+SWALL+HCELL)+TWALL),0.0,
560 K,89,          (AWALL+SWALL+HCELL),          TWALL,0.0,
561 K,90,          (SWALL+HCELL),          (AWALL+TWALL),0.0,
562 K,91,          HCELL,          (SWALL+AWALL+TWALL),0.0,
563 K,92,          (AWALL+SWALL+HCELL),          (2.0*(AWALL+SWALL+HCELL)+TWALL),0.0,
564 K,93,          (SWALL+HCELL),          (AWALL+TWALL+(2.0*(SWALL+HCELL))),0.0,
565 K,94,          HCELL,          (AWALL+SWALL+TWALL+(2.0*HCELL)),0.0,
566 L,83,84,
567 L,84,85,
568 L,86,87,
569 L,87,88,
570 L,89,83,
571 L,84,90,
572 L,85,91,
573 L,86,94,
574 L,87,93,
575 L,88,92,
576 L,90,89,
577 L,91,90,
578 L,94,93,
579 L,93,92,
580 L,85,86,
581 L,91,94,
582 L,90,93,
583 L,89,92,
584 AL,130,123,131,122,
585 AL,116,121,126,120,
586 AL,117,122,127,121,
587 AL,118,124,128,123,
588 AL,119,125,129,124,
589 AL,131,128,132,127,
590 AL,132,129,133,126,
591 /COM,          *****
592 /COM,          Define center full-tube
593 /COM,          (K's 95,96,97,98,99,100,101,102,103,104,105,106)
594 /COM,          (L's 134,135,136,137,138,139,140,141,142,143,144,145)
595 /COM,          ( 146,147,148,149,150,151,152,153)
596 /COM,          (A's 46,47,48,49,50,51,52,53,54)
597 K,95, (PITCH-HCELL-SWALL-AWALL),          TWALL,0.0,
598 K,96, (PITCH+HCELL+SWALL+AWALL),          TWALL,0.0,
599 K,97, (PITCH-HCELL-SWALL),          (AWALL+TWALL),0.0,
600 K,98, (PITCH+HCELL+SWALL),          (AWALL+TWALL),0.0,
601 K,99, (PITCH-HCELL),          (AWALL+SWALL+TWALL),0.0,
602 K,100, (PITCH+HCELL),          (AWALL+SWALL+TWALL),0.0,
603 K,101, (PITCH-HCELL),          ((2.0*HCELL)+AWALL+SWALL+TWALL),0.0,
604 K,102, (PITCH+HCELL),          ((2.0*HCELL)+AWALL+SWALL+TWALL),0.0,
605 K,103, (PITCH-HCELL-SWALL),          (2.0*(HCELL+SWALL)+AWALL+TWALL),0.0,
606 K,104, (PITCH+HCELL+SWALL),          (2.0*(HCELL+SWALL)+AWALL+TWALL),0.0,
607 K,105, (PITCH-HCELL-SWALL-AWALL),          (2.0*(HCELL+SWALL+AWALL)+TWALL),0.0,
608 K,106, (PITCH+HCELL+SWALL+AWALL),          (2.0*(HCELL+SWALL+AWALL)+TWALL),0.0,
609 L,95,97,
610 L,97,99,

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611 L,101,103,
612 L,103,105,
613 L,96,98,
614 L,98,100,
615 L,102,104,
616 L,104,106,
617 L,96,95,
618 L,97,98,
619 L,99,100,
620 L,101,102,
621 L,103,104,
622 L,105,106,
623 L,95,105,
624 L,97,103,
625 L,99,101,
626 L,100,102,
627 L,98,104,
628 L,106,96,
629 AL,144,151,145,150,
630 AL,142,138,143,134,
631 AL,143,139,144,135,
632 AL,145,140,146,136,
633 AL,146,141,147,137,
634 AL,148,134,149,137,
635 AL,149,135,150,136,
636 AL,151,139,152,140,
637 AL,152,138,153,141,
638 /COM, *****
639 /COM, Define edge half-tube
640 /COM, (K's 107,108,109,110,111,112,113,114,115,116,117)
641 /COM, (L's 154,155,156,157,158,159,160,161,162,163,164,165)
642 /COM, ( 166,167,168,169)
643 /COM, (A's 55,56,57,58,59,60)
644 K,107, 0.0, (3.5*PITCH+HCELL),0.0,
645 K,108, HCELL, (3.5*PITCH+HCELL),0.0,
646 K,109, 0.0, (3.5*PITCH-HCELL),0.0,
647 K,110, HCELL, (3.5*PITCH-HCELL),0.0,
648 K,111, 0.0, (3.5*PITCH+HCELL+SWALL),0.0,
649 K,112, (HCELL+SWALL), (3.5*PITCH+HCELL+SWALL),0.0,
650 K,113, 0.0, (3.5*PITCH-HCELL-SWALL),0.0,
651 K,114, (HCELL+SWALL), (3.5*PITCH-HCELL-SWALL),0.0,
652 K,115, (HCELL+SWALL+AWALL), (3.5*PITCH+HCELL+SWALL),0.0,
653 K,116, 0.0, (3.5*PITCH-HCELL-SWALL-AWALL),0.0,
654 K,117, (HCELL+SWALL+AWALL), (3.5*PITCH-HCELL-SWALL-AWALL),0.0,
655 L,116,113,
656 L,113,109,
657 L,107,111,
658 L,114,117,
659 L,110,114,
660 L,112,115,
661 L,108,112,
662 L,116,117,
663 L,113,114,
664 L,109,110,
665 L,108,107,
666 L,111,112,
667 L,109,107,
668 L,110,108,
669 L,114,112,
670 L,115,117,
671 AL,166,163,167,164,
672 AL,161,157,162,154,
673 AL,162,158,163,155,
674 AL,164,160,165,156,
675 AL,167,158,168,160,
676 AL,168,157,169,159,
677 /COM, *****
678 /COM, Define edge full-tube
679 /COM, (K's 118,119,120,121,122,123,124,125,126,127,128,129)
680 /COM, (L's 170,171,172,173,174,175,176,177,178,179,180,181)

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681 /COM,          ( 182,183,184,185,186,187,188)
682 /COM,          (A's 61,62,63,64,65,66,67,68)
683 K,118,          (3.0*PITCH-HCELL),          (AWALL+SWALL+TWALL),0.0,
684 K,119,          (3.0*PITCH+HCELL),          (AWALL+SWALL+TWALL),0.0,
685 K,120,          (3.0*PITCH-HCELL),(2.0*(HCELL)+AWALL+SWALL+TWALL),0.0,
686 K,121,          (3.0*PITCH+HCELL),(2.0*(HCELL)+AWALL+SWALL+TWALL),0.0,
687 K,122,          (3.0*PITCH-HCELL-SWALL),          (AWALL+TWALL),0.0,
688 K,123,          (3.0*PITCH+HCELL+SWALL),          (AWALL+TWALL),0.0,
689 K,124,          (3.0*PITCH-HCELL-SWALL),(2.0*(HCELL+SWALL)+AWALL+TWALL),0.0,
690 K,125,          (3.0*PITCH+HCELL+SWALL),(2.0*(HCELL+SWALL)+AWALL+TWALL),0.0,
691 K,126,(3.0*PITCH-HCELL-SWALL-AWALL),          TWALL,0.0,
692 K,127,          (3.0*PITCH+HCELL+SWALL),          TWALL,0.0,
693 K,128,(3.0*PITCH-HCELL-SWALL-AWALL),(2.0*(HCELL+SWALL+AWALL)+TWALL),0.0,
694 K,129,          (3.0*PITCH+HCELL+SWALL),(2.0*(HCELL+SWALL+AWALL)+TWALL),0.0,
695 L,122,126,
696 L,118,122,
697 L,120,124,
698 L,124,128,
699 L,123,127,
700 L,119,123,
701 L,121,125,
702 L,129,125,
703 L,127,126,
704 L,122,123,
705 L,118,119,
706 L,120,121,
707 L,124,125,
708 L,128,129,
709 L,126,128,
710 L,122,124,
711 L,118,120,
712 L,119,121,
713 L,125,123,
714 AL,180,187,181,186,
715 AL,178,174,179,170,
716 AL,179,175,180,171,
717 AL,181,176,182,172,
718 AL,182,177,183,173,
719 AL,184,170,185,173,
720 AL,185,171,186,172,
721 AL,187,175,188,176,
722 NUMMRG,KP,
723 /COM,          *****
724 /COM,          Set element shapes and sizes for tubes
725 /COM,          8x8 mesh in fuel with 2
726 /COM,          divisions per tube layer
727 ESHAPE,2,
728 ESIZE,,1,
729 LSEL,S,LINE,,130,133,1,
730 LSEL,A,LINE,,142,153,1,
731 LSEL,A,LINE,,166,169,1,
732 LSEL,A,LINE,,178,188,1,
733 LESIZE,ALL,,, 8,
734 LSEL,S,LINE,,120,125,1,
735 LSEL,A,LINE,,161,165,1,
736 LESIZE,ALL,,, 4,
737 LSEL,S,LINE,,116,119,1,
738 LSEL,A,LINE,,126,129,1,
739 LSEL,A,LINE,,134,141,1,
740 LSEL,A,LINE,,154,160,1,
741 LSEL,A,LINE,,170,177,1,
742 LESIZE,ALL,,, 2,
743 LSEL,ALL,
744 /COM,
745 /COM,          Mesh areas
746 /COM,          first fuel, then stainless, then aluminum
747 MAT,14,
748 TYPE,1,
749 AMESH,39,
750 AMESH,46,

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751 AMESH,55,
752 AMESH,61,
753 MAT, 1,
754 TYPE,1,
755 AMESH,41,42,1,
756 AMESH,44,
757 AMESH,48,49,1,
758 AMESH,52,53,1,
759 AMESH,57,59,1,
760 AMESH,63,64,1,
761 AMESH,67,68,1,
762 MAT,13,
763 TYPE,1,
764 AMESH,40,43,3,
765 AMESH,45,
766 AMESH,47,50,3,
767 AMESH,51,54,3,
768 AMESH,56,60,4,
769 AMESH,62,65,3,
770 AMESH,66,
771 /COM, *****
772 /COM, Copy tube mesh
773 /COM,
774 /COM, center half tube above and below
775 /COM, (A's 69-75,76-82)
776 AGEN,3,39,45,1,0.0,PITCH,0.0,0,0,
777 /COM, (A's 83-89,90-96,97-103)
778 AGEN,4,39,45,1,0.0,(0.0-PITCH),0.0,0,0,
779 /COM,
780 /COM, center fuel tube above and below
781 /COM, (A's 104-112,113-121)
782 AGEN,3,46,54,1,0.0,PITCH,0.0,0,0,
783 /COM, (A's 122-130,131-139,140-148)
784 AGEN,4,46,54,1,0.0,(0.0-PITCH),0.0,0,0,
785 /COM, (A's 149-157)
786 AGEN,2,46,54,1,PITCH,0.0,0.0,0,0,
787 /COM, (A's 158-166,167-175)
788 AGEN,3,149,157,1,0.0,PITCH,0.0,0,0,
789 /COM, (A's 176-184,185-193,194-202)
790 AGEN,4,149,157,1,0.0,(0.0-PITCH),0.0,0,0,
791 /COM,
792 /COM, side edge fuel tube above and below
793 /COM, (A's 203-210)
794 AGEN,2,61,68,1,0.0,PITCH,0.0,0,0,
795 /COM, (A's 211-218,219-226)
796 AGEN,3,61,68,1,0.0,(0.0-PITCH),0.0,0,0,
797 /COM,
798 /COM, edge half tube bottom (13)
799 /COM, (A's 227-232)
800 ARSYM,Y,55,60,1,0,0,0,
801 /COM, *****
802 /COM, Define thin stainless layers
803 /COM, (K's 380,381,382,383,384,385,286,387,388,389, through 397)
804 /COM, (A's 233 - 301)
805 K,380, (0.5*PITCH), (3.5*PITCH+HCELL+SWALL),0.0,
806 K,381, (0.5*PITCH), (3.0*PITCH),0.0,
807 K,382, (0.5*PITCH), (3.0*PITCH+TWALL),0.0,
808 K,383, (0.5*PITCH+TWALL), (3.0*PITCH),0.0,
809 K,384, (1.5*PITCH-TWALL), (3.0*PITCH),0.0,
810 K,385, (1.5*PITCH+TWALL), (3.0*PITCH),0.0,
811 K,386, (2.5*PITCH), (3.0*PITCH),0.0,
812 K,387, (2.5*PITCH), (2.0*PITCH),0.0,
813 K,388, (2.5*PITCH), (2.0*PITCH+TWALL),0.0,
814 K,389, (2.5*PITCH+TWALL), (2.0*PITCH),0.0,
815 K,390,(3.0*PITCH+HCELL+SWALL), (2.0*PITCH),0.0,
816 /COM,
817 K,391,(3.0*PITCH+HCELL+SWALL), (-2.0*PITCH),0.0,
818 K,392, (2.5*PITCH+TWALL), (-2.0*PITCH),0.0,
819 K,393, (2.5*PITCH), (-2.0*PITCH-TWALL),0.0,
820 K,394, (2.5*PITCH), (-2.0*PITCH),0.0,

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821	K,395,	(2.5*PITCH),	(-3.0*PITCH),0.0,
822	K,396,	(1.5*PITCH+TWALL),	(-3.0*PITCH),0.0,
823	K,397,	(1.5*PITCH-TWALL),	(-3.0*PITCH),0.0,
824	K,398,	(0.5*PITCH+TWALL),	(-3.0*PITCH),0.0,
825	K,399,	(0.5*PITCH),	(-3.0*PITCH-TWALL),0.0,
826	K,400,	(0.5*PITCH),	(-3.0*PITCH),0.0,
827	K,401,	(0.5*PITCH),	(-3.5*PITCH-HCELL-SWALL),0.0,
828	/COM,		
829	A,152,116,117,153,		
830	A,117,382,381,153,		
831	A,381,383,213,153,		
832	A,117,115,380,382,		
833	A,153,213,207,149,		
834	A,213,383,384,212,		
835	A,212,384,385,285,		
836	A,285,385,386,284,		
837	A,212,285,279,206,		
838	A,284,386,388,278,		
839	A,278,388,387,272,		
840	A,272,387,389,333,		
841	A,272,333,327,266,		
842	A,333,389,390,332,		
843	A,278,272,273,279,		
844	A,206,279,273,200,		
845	A,200,273,267,194,		
846	A,200,206,207,201,		
847	A,141,149,207,201,		
848	A,141,201,195,137,		
849	A,141,149,146,140,		
850	A, 88,134,137, 92,		
851	A, 92,137,195,105,		
852	A, 92,105, 95, 89,		
853	A,105,195,194,106,		
854	A,106,194,267,261,		
855	A,106,261,255, 96,		
856	A,261,267,266,260,		
857	A,260,266,327,128,		
858	A,260,128,126,254,		
859	A,128,327,326,129,		
860	A,296,254,126,345,		
861	A,296,345,339,290,		
862	A,345,126,127,344,		
863	A,296,254,255,297,		
864	A,224, 96,255,297,		
865	A,224,297,291,218,		
866	A,224, 96, 95,225,		
867	A,165, 89, 95,225,		
868	A,165, 89, 83,164,		
869	A,165,225,219,161,		
870	A,177,161,219,237,		
871	A,177,161,158,176,		
872	A,177,237,231,173,		
873	A,237,219,218,236,		
874	A,236,218,291,309,		
875	A,236,309,303,230,		
876	A,309,291,290,308,		
877	A,308,290,339,357,		
878	A,308,357,351,302,		
879	A,357,339,338,356,		
880	A,350,391,392,351,		
881	A,351,392,394,302,		
882	A,302,394,393,320,		
883	A,320,393,395,314,		
884	A,320,302,303,321,		
885	A,248,230,303,321,		
886	A,248,321,315,242,		
887	A,248,230,231,249,		
888	A,189,173,231,249,		
889	A,189,173,170,188,		
890	A,189,249,243,185,		

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891 A,243,398,400,185,
892 A,185,400,399,363,
893 A,363,185,182,362,
894 A,363,399,401,368,
895 A,398,243,242,397,
896 A,242,315,396,397,
897 A,315,314,395,396,
898 MAT,1,
899 TYPE,1,
900 ESHAPE,2,
901 AMESH,233,301,1,
902 NUMMRG,NODE,
903 NUMMRG,KP,
904 /COM, *****
905 /COM,          Create mesh in tube guides
906 /COM,          (L's 686,687,688)
907 ESIZE,,2,
908 LESIZE,47,,, 2,
909 LESIZE,48,,, 4,
910 LESIZE,49,,, 2,
911 LESIZE,50,,, 4,
912 LESIZE,51,,, 13,
913 LESIZE,52,,, 2,
914 LESIZE,53,,, 13,
915 LESIZE,54,,, 8,
916 LESIZE,55,,, 18,
917 LESIZE,56,,, 13,
918 LESIZE,57,,, 13,
919 LESIZE,58,,, 2,
920 LESIZE,59,,, 8,
921 LESIZE,60,,, 2,
922 LESIZE,61,,, 2,
923 LESIZE,62,,, 1,
924 LESIZE,63,,, 1,
925 LESIZE,64,,, 2,
926 LESIZE,65,,, 2,
927 LESIZE,66,,, 2,
928 LESIZE,67,,, 9,
929 LESIZE,68,,, 9,
930 LESIZE,69,,, 2,
931 LESIZE,70,,, 13,
932 LESIZE,71,,, 13,
933 LESIZE,72,,, 2,
934 LESIZE,73,,, 2,
935 LESIZE,74,,, 38,
936 LESIZE,75,,, 8,
937 LESIZE,76,,, 2,
938 LESIZE,77,,, 4,
939 LESIZE,78,,, 4,
940 LESIZE,79,,, 8,
941 LESIZE,80,,, 2,
942 LESIZE,81,,, 4,
943 LESIZE,82,,, 4,
944 LESIZE,83,,, 8,
945 LESIZE,84,,, 2,
946 LESIZE,85,,, 4,
947 LESIZE,86,,, 4,
948 LESIZE,87,,, 8,
949 LESIZE,88,,, 2,
950 LESIZE,89,,, 2,
951 LESIZE,90,,, 13,
952 LESIZE,91,,, 2,
953 LESIZE,92,,, 13,
954 LESIZE,93,,, 9,
955 LESIZE,94,,, 2,
956 LESIZE,95,,, 1,
957 LESIZE,96,,, 2,
958 LESIZE,97,,, 1,
959 LESIZE,98,,, 2,
960 LESIZE,99,,, 9,

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961 LESIZE,100,,, 2,
962 LESIZE,101,,, 2,
963 LESIZE,102,,,18,
964 LESIZE,103,,, 2,
965 LESIZE,104,,, 8,
966 LESIZE,105,,, 2,
967 LESIZE,106,,, 8,
968 LESIZE,107,,,13,
969 LESIZE,108,,,13,
970 LESIZE,109,,,13,
971 LESIZE,110,,,13,
972 LESIZE,111,,, 2,
973 LESIZE,112,,, 4,
974 LESIZE,113,,, 2,
975 LESIZE,114,,, 4,
976 LSEL,S,LINE,,58,59,1,
977 LSEL,A,LINE,,54,
978 LCCAT,ALL,
979 LSEL,S,LINE,,75,76,1,
980 LSEL,A,LINE,,79,80,1,
981 LSEL,A,LINE,,83,84,1,
982 LSEL,A,LINE,,87,
983 LCCAT,ALL,
984 LSEL,S,LINE,,104,106,1,
985 LCCAT,ALL,
986 LSEL,ALL,
987 MAT,1,
988 TYPE,1,
989 AMESH,19,38,1,
990 /COM, *****
991 /COM,          Create mesh in MPC shell
992 /COM,          (L's 689,690,691)
993 LESIZE,22,,, 4,
994 LESIZE,23,,, 3,
995 LESIZE,25,,, 8,
996 LESIZE,27,,,15,
997 LESIZE,28,,,12,
998 LESIZE,29,,, 5,
999 LESIZE,30,,,11,
1000 LESIZE,32,,, 8,
1001 LESIZE,34,,, 8,
1002 LESIZE,36,,,11,
1003 LESIZE,37,,, 5,
1004 LESIZE,38,,,12,
1005 LESIZE,39,,,15,
1006 LESIZE,41,,, 8,
1007 LESIZE,43,,, 3,
1008 LESIZE,44,,, 4,
1009 LSEL,S,LINE,,22,44,1,
1010 LCCAT,ALL,
1011 LSEL,ALL,
1012 LESIZE,17,,,73,
1013 LESIZE,18,,,73,
1014 LESIZE,21,,, 3,
1015 LESIZE,45,,, 3,
1016 LCCAT,17,18,
1017 ESHAPE,2,
1018 MAT,1,
1019 TYPE,1,
1020 AMESH,6,
1021 /COM,          Assume vacuum between shell and inner barrier
1022 LESIZE,14,,,73,
1023 LESIZE,13,,,73,
1024 LESIZE,19,,, 2,
1025 LESIZE,20,,, 2,
1026 LCCAT,14,13,
1027 ESHAPE,2,
1028 /COM,          No MAT,7,
1029 /COM,          No TYPE,1,
1030 /COM,          No AMESH,5,

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1031 /COM,          Delete concatanated lines
1032 /COM,          (L's freed up 686,687,688,689,690,691)
1033 LDELE,686,691,1,
1034 /COM,          *****
1035 /COM,          Create mesh in inner and outer barrier
1036 LSEL,S,LINE,,7,10,1,
1037 LESIZE,ALL,,,73,
1038 LSEL,ALL,
1039 LESIZE, 6,,, 3,
1040 LESIZE,15,,, 3,
1041 LESIZE,16,,, 3,
1042 LESIZE, 5,,, 3,
1043 LESIZE,11,,, 3,
1044 LESIZE,12,,, 3,
1045 MAT,2,
1046 TYPE,1,
1047 AMESH,3,4,1,
1048 MAT,3,
1049 TYPE,1,
1050 AMESH,1,2,1,
1051 /COM,          *****
1052 /COM,          Create mesh in empty basket spaces
1053 ESIZE,0.1,
1054 LESIZE, 46,,, 1,
1055 LESIZE,115,,, 1,
1056 ESHAPE,0,
1057 MAT,7,
1058 TYPE,1,
1059 AMESH, 7,
1060 ESHAPE,0,
1061 MAT,7,
1062 TYPE,1,
1063 AMESH, 8,11,1,
1064 ESHAPE,2,
1065 MAT,7,
1066 TYPE,1,
1067 AMESH,12,13,1,
1068 ESHAPE,0,
1069 MAT,7,
1070 TYPE,1,
1071 AMESH,14,16,1,
1072 ESHAPE,2,
1073 MAT,7,
1074 TYPE,1,
1075 AMESH,17,
1076 ESHAPE,0,
1077 MAT,7,
1078 TYPE,1,
1079 AMESH,18,
1080 /COM,          *****
1081 /COM,          Define mesh and radiation surface elements for
1082 /COM,          tube/guides gap
1083 /COM,          (L's 686,687)
1084 /COM,          (A's 302)
1085 L,47,111,
1086 L,366,82,
1087 /COM,          Select lines around tubes
1088 LSEL,S,LINE,,686,
1089 LSEL,A,LINE,,165,
1090 LSEL,A,LINE,,159,
1091 LSEL,A,LINE,,580,
1092 LSEL,A,LINE,,581,
1093 LSEL,A,LINE,,575,
1094 LSEL,A,LINE,,577,
1095 LSEL,A,LINE,,583,
1096 LSEL,A,LINE,,585,
1097 LSEL,A,LINE,,588,
1098 LSEL,A,LINE,,591,
1099 LSEL,A,LINE,,593,
1100 LSEL,A,LINE,,596,

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1101 LSEL,A,LINE,,600,
1102 LSEL,A,LINE,,601,
1103 LSEL,A,LINE,,512,
1104 LSEL,A,LINE,,517,
1105 LSEL,A,LINE,,506,
1106 LSEL,A,LINE,,624,
1107 LSEL,A,LINE,,177,
1108 LSEL,A,LINE,,188,
1109 LSEL,A,LINE,,174,
1110 LSEL,A,LINE,,629,
1111 LSEL,A,LINE,,531,
1112 LSEL,A,LINE,,536,
1113 LSEL,A,LINE,,525,
1114 LSEL,A,LINE,,652,
1115 LSEL,A,LINE,,550,
1116 LSEL,A,LINE,,555,
1117 LSEL,A,LINE,,544,
1118 LSEL,A,LINE,,653,
1119 LSEL,A,LINE,,654,
1120 LSEL,A,LINE,,656,
1121 LSEL,A,LINE,,658,
1122 LSEL,A,LINE,,661,
1123 LSEL,A,LINE,,685,
1124 LSEL,A,LINE,,684,
1125 LSEL,A,LINE,,682,
1126 LSEL,A,LINE,,673,
1127 LSEL,A,LINE,,675,
1128 LSEL,A,LINE,,679,
1129 LSEL,A,LINE,,680,
1130 LSEL,A,LINE,,570,
1131 LSEL,A,LINE,,567,
1132 LSEL,A,LINE,,687,
1133 /COM,          Select lines around tube guides
1134 LSEL,A,LINE,,112,
1135 LSEL,A,LINE,,111,
1136 LSEL,A,LINE,, 43,
1137 LSEL,A,LINE,,108,
1138 LSEL,A,LINE,,102,
1139 LSEL,A,LINE,, 99,
1140 LSEL,A,LINE,, 90,
1141 LSEL,A,LINE,, 89,
1142 LSEL,A,LINE,, 37,
1143 LSEL,A,LINE,, 88,
1144 LSEL,A,LINE,, 74,
1145 LSEL,A,LINE,, 73,
1146 LSEL,A,LINE,, 29,
1147 LSEL,A,LINE,, 72,
1148 LSEL,A,LINE,, 71,
1149 LSEL,A,LINE,, 68,
1150 LSEL,A,LINE,, 55,
1151 LSEL,A,LINE,, 51,
1152 LSEL,A,LINE,, 23,
1153 LSEL,A,LINE,, 49,
1154 LSEL,A,LINE,, 50,
1155 /COM,          Define area
1156 AL,ALL,
1157 /COM,          Create radiation surface elements
1158 NSLL,S,1,
1159 MAT,1,
1160 TYPE,7,
1161 ESURF,
1162 LSEL,ALL,
1163 NSEL,ALL,
1164 /COM,          Mesh gap
1165 ESHAPE,0,
1166 LESIZE,686,,,1,
1167 LESIZE,687,,,1,
1168 MAT,7,
1169 TYPE,1,
1170 AMESH,302,

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1171 ESHAPE,2,
1172 /COM, *****
1173 /COM, Create other radiation surface elements
1174 /COM, Basket spaces
1175 MAT,1,
1176 TYPE,17,
1177 LMESH,22,
1178 LMESH,25,27,2,
1179 LMESH,28,38,2,
1180 LMESH,39,41,2,
1181 LMESH,44,
1182 LMESH,46,48,2,
1183 LMESH,53,54,1,
1184 LMESH,56,57,1,
1185 LMESH,59,
1186 LMESH,61,64,1,
1187 LMESH,67,70,3,
1188 LMESH,75,
1189 LMESH,77,79,1,
1190 LMESH,81,83,1,
1191 LMESH,85,87,1,
1192 LMESH,92,97,1,
1193 LMESH,104,
1194 LMESH,106,107,1,
1195 LMESH,109,110,1,
1196 LMESH,114,115,1,
1197 /COM, MPC shell/inner barrier gap
1198 MAT,1,
1199 TYPE,27,
1200 LMESH,17,18,1,
1201 MAT,2,
1202 TYPE,27,
1203 LMESH,13,14,1,
1204 FINISH
1205 /COM, *****
1206 /COM, Create element mesh plots to illustrate model
1207 /COM, View mesh for entire model
1208 /RESET
1209 /TRIAD,OFF,
1210 /NUM,1,
1211 /PNUM,MAT,1,
1212 /TYPE,HIDP,
1213 /GLINE,,0,
1214 /FOCUS,1,(WPRAD/10.0),0.0,0.0,0,
1215 /TITLE,40 BWR MPC/Waste Package - 1/2 FEM Model
1216 /SHOW,meshfull,grph,1,8,
1217 EPLOT
1218 ESEL,U,MAT,,7,
1219 /SHOW,meshgap,grph,1,8,
1220 EPLOT
1221 /COM, View mesh for radiation substructure
1222 /PNUM,MAT,0,
1223 /PNUM,TYPE,1,
1224 ESEL,S,TYPE,,7,
1225 ESEL,A,TYPE,,17,
1226 ESEL,A,TYPE,,27,
1227 /TITLE,40 BWR MPC/Waste Package - Radiation Matrix
1228 /SHOW,meshrad,grph,1,8,
1229 EPLOT
1230 ESEL,ALL,
1231 /TITLE,40 BWR MPC/Waste Package with 10 yr old, MOX SNF
1232 /COM, *****
1233 /COM, Generate super-elements
1234 /AUX12,
1235 ESEL,S,TYPE,,7,
1236 NSLE,S,
1237 STEF,5.67E-8,
1238 GEOM,1,0,
1239 VTYPE,0,800,
1240 WRITE,tubegap,

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1241 ESEL,S,TYPE,,17,
1242 NSLE,S,
1243 STEF,5.67E-8,
1244 GEOM,1,0,
1245 VTYPE,0,800,
1246 WRITE,spaces,
1247 ESEL,S,TYPE,,27,
1248 NSLE,S,
1249 STEF,5.67E-8,
1250 GEOM,1,0,
1251 VTYPE,0,800,
1252 WRITE,shellgap,
1253 ESEL,ALL,
1254 NSEL,ALL,
1255 FINISH
1256 /PREP7,
1257 TYPE,18,
1258 SE,tubegap,
1259 SE,spaces,
1260 SE,shellgap,
1261 /COM, Delete radiation edge elements
1262 ESEL,S,TYPE,,7,
1263 EDELE,ALL,
1264 ESEL,ALL,
1265 LSEL,S,TYPE,,17,
1266 LSEL,A,TYPE,,27,
1267 LCLEAR,ALL,
1268 LSEL,ALL,
1269 FINISH
1270 /COM, *****
1271 /COM, Set solution parameters and apply B.C.'s
1272 /COM,
1273 /COM, Solve steady-state for initial conditions
1274 /COM, with WP surface equal to drift ambient
1275 /COM, temperature from repository model.
1276 /SOLU
1277 ANTYPE,TRAN,NEW,
1278 NROPT,AUTO,
1279 TRNOPT,FULL,
1280 TOFFST,273.15,
1281 LSEL,S,LINE,,7,
1282 LSEL,A,LINE,,8,
1283 NSLL,S,1,
1284 D,ALL,TEMP,DFAMBT,
1285 LSEL,ALL,
1286 NSEL,ALL,
1287 ASEL,S,MAT,,14,
1288 ESLA,S,
1289 BFE,ALL,HGEN,,(FUEL(TM_START)),
1290 ASEL,ALL,
1291 ESEL,ALL,
1292 TIMINT,OFF,
1293 TIME,1e-6,
1294 AUTOTS,ON,
1295 KBC,0,
1296 SOLVE
1297 /COM, Solve steady-state for initial conditions
1298 /COM, with WP surface temperatures from repository
1299 /COM, steady-state solution.
1300 LSEL,S,LINE,,7,
1301 LSEL,A,LINE,,8,
1302 NSLL,S,1,
1303 DDELE,ALL,TEMP,
1304 LSEL,ALL,
1305 NSEL,ALL,
1306 DK,11,TEMP,(WPTOP(TM_START)),,1,
1307 DK,10,TEMP,(WPSID(TM_START)),,1,
1308 DK,9,TEMP,(WPBOT(TM_START)),,1,
1309 ASEL,S,MAT,,14,
1310 ESLA,S,

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1311 BFE,ALL,HGEN,,(FUEL(TM_START)),
1312 ASEL,ALL,
1313 ESEL,ALL,
1314 TIMINT,OFF,
1315 TIME,2e-6,
1316 AUTOTS,ON,
1317 KBC,0,
1318 SOLVE
1319 /COM, *****
1320 /COM,      Set time integration parameters
1321 TIMINT,ON,
1322 AUTOTS,ON,
1323 /COM,      Time substep ranges from 10 sec to 1/4 loadstep
1324 NSUBST,10,40,4,ON
1325 /COM,      Begin Transient
1326 /COM,      Apply loads and solve for 0 to .9 years
1327 *DO,TM,TM_START,TME0,TMI0
1328     TIME,TM,
1329     ASEL,S,MAT,,14,
1330     ESLA,S,
1331     BFE,ALL,HGEN,,(FUEL(TM)),
1332     ASEL,ALL
1333     ESEL,ALL
1334     DK,11,TEMP,(WPTOP(TM)),,1,
1335     DK,10,TEMP,(WPSID(TM)),,1,
1336     DK, 9,TEMP,(WPBOT(TM)),,1,
1337     SOLVE
1338 *ENDDO
1339 /COM,      Apply loads and solve for 1 to 9 years
1340 *DO,TM,TME1,TME9,TMI1
1341     TIME,TM,
1342     ASEL,S,MAT,,14,
1343     ESLA,S,
1344     BFE,ALL,HGEN,,(FUEL(TM)),
1345     ASEL,ALL
1346     ESEL,ALL
1347     DK,11,TEMP,(WPTOP(TM)),,1,
1348     DK,10,TEMP,(WPSID(TM)),,1,
1349     DK, 9,TEMP,(WPBOT(TM)),,1,
1350     SOLVE
1351 *ENDDO
1352 /COM,      Apply loads and solve for 10 to 90 years
1353 *DO,TM,TME10,TME90,TMI10
1354     TIME,TM,
1355     ASEL,S,MAT,,14,
1356     ESLA,S,
1357     BFE,ALL,HGEN,,(FUEL(TM)),
1358     ASEL,ALL
1359     ESEL,ALL
1360     DK,11,TEMP,(WPTOP(TM)),,1,
1361     DK,10,TEMP,(WPSID(TM)),,1,
1362     DK, 9,TEMP,(WPBOT(TM)),,1,
1363     SOLVE
1364 *ENDDO
1365 /COM,      Apply loads and solve for 100 to 1000 years
1366 *DO,TM,TME100,TME1000,TMI100
1367     TIME,TM,
1368     ASEL,S,MAT,,14,
1369     ESLA,S,
1370     BFE,ALL,HGEN,,(FUEL(TM)),
1371     ASEL,ALL
1372     ESEL,ALL
1373     DK,11,TEMP,(WPTOP(TM)),,1,
1374     DK,10,TEMP,(WPSID(TM)),,1,
1375     DK, 9,TEMP,(WPBOT(TM)),,1,
1376     SOLVE
1377 *ENDDO
1378 FINISH
1379 SAVE,
1380 /COM, *****

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1381 /COM, Create element contour plots of solution results
1382 /COM,
1383 /COM, Sort through solution results for time of max temp.
1384 /POST26,
1385 NSOL,2,(NODE(0.0,(-0.5*PITCH),0.0)),TEMP,,peakclad,
1386 STORE,NEW,
1387 *GET,TMTMAX,VARI,2,EXTREM,TMAX,
1388 FINISH
1389 /POST1,
1390 /COM, Create temperature contour plots of WP at peak
1391 /RESET
1392 /TRIAD,OFF,
1393 /NUM, 1,
1394 /PNUM,MAT, 1,
1395 /TYPE,HIDP,
1396 /GLINE,,-1,
1397 /FOCUS,1,(WPRAD/10.0),0.0,0.0,0,
1398 ESEL,U,MAT,,7,
1399 SET,NEAR,,,,TMTMAX,
1400 /TITLE, 40 BWR MOX MPC/WP Time of Peak Temp. (%TMTMAX/3.15576E7% years)
1401 /SHOW,solupk,grph,0,8,
1402 /CONTOUR,1,128,AUTO,
1403 PLNSOL,TEMP,
1404 /COM, Create temperature contour plots at 10, 50, and 100 yrs
1405 SET,NEAR,,,,TME10,
1406 /TITLE, 40 BWR MOX MPC/WP at 10 years
1407 /SHOW,solu10,grph,0,8,
1408 /CONTOUR,1,128,USER,
1409 PLNSOL,TEMP,
1410 SET,NEAR,,,,TME50,
1411 /TITLE, 40 BWR MOX MPC/WP at 50 years
1412 /SHOW,solu50,grph,0,8,
1413 /CONTOUR,1,128,USER,
1414 PLNSOL,TEMP,
1415 SET,NEAR,,,,TME100,
1416 /TITLE, 40 BWR MOX MPC/WP at 100 years
1417 /SHOW,solu100,grph,0,8,
1418 /CONTOUR,1,128,USER,
1419 PLNSOL,TEMP,
1420 ESEL,ALL,
1421 FINISH
1422 /COM, *****
1423 /COM, Print time/temperature output at specific locations
1424 /COM, Save profile from center to edge
1425 /COM,
1426 /COM, Variable Legend: A01i000
1427 /COM, c = center of assembly
1428 /COM, h = halfway between center and tube
1429 /COM, s = inside structural stainless tube layer
1430 /COM, a = aluminum-born tube layer
1431 /COM, t = stainless tube cladding
1432 /COM, g = tube guide
1433 /COM, m = mpc shell
1434 /COM, i = inner barrier of DC
1435 /COM, o = outer barrier of DC
1436 /COM, ## = ID number of assembly (01 is center)
1437 /COM, i = side of assembly toward center of WP
1438 /COM, o = side of assembly toward edge of WP
1439 /COM, 000 = profile center down
1440 /COM, 045 = profile 45 deg down
1441 /COM, 090 = profile center side
1442 /COM, 135 = profile 45 deg up
1443 /COM, 180 = profile center up
1444 /POST26,
1445 NUMVAR,41,
1446 /COM,
1447 /COM, *****
1448 /COM, * Temperature Profile from center to bottom of WP (0 deg.) *
1449 /COM, *****
1450 NSOL, 2,(NODE(0.0, 0.0,0.0)),TEMP,,t02i000,

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1451 NSOL, 3, (NODE(0.0, (0.0-ATWCL), 0.0)), TEMP, , a02i000,
1452 NSOL, 4, (NODE(0.0, (0.0-STWCL), 0.0)), TEMP, , s02i000,
1453 NSOL, 5, (NODE(0.0, (0.0-STWCL-QCELL), 0.0)), TEMP, , h02i000,
1454 NSOL, 6, (NODE(0.0, (-0.5*PITCH), 0.0)), TEMP, , c02i000,
1455 NSOL, 7, (NODE(0.0, (-0.5*PITCH-QCELL), 0.0)), TEMP, , h02o000,
1456 NSOL, 8, (NODE(0.0, (-0.5*PITCH-HCELL), 0.0)), TEMP, , s02o000,
1457 NSOL, 9, (NODE(0.0, (-0.5*PITCH-SCCELL), 0.0)), TEMP, , a02o000,
1458 NSOL, 10, (NODE(0.0, (-1.0*PITCH), 0.0)), TEMP, , t08i000,
1459 NSOL, 11, (NODE(0.0, (-1.0*PITCH-ATWCL), 0.0)), TEMP, , a08i000,
1460 NSOL, 12, (NODE(0.0, (-1.0*PITCH-STWCL), 0.0)), TEMP, , s08i000,
1461 NSOL, 13, (NODE(0.0, (-1.0*PITCH-TQPC), 0.0)), TEMP, , h08i000,
1462 NSOL, 14, (NODE(0.0, (-1.5*PITCH), 0.0)), TEMP, , c08i000,
1463 NSOL, 15, (NODE(0.0, (-1.5*PITCH-QCELL), 0.0)), TEMP, , h08o000,
1464 NSOL, 16, (NODE(0.0, (-1.5*PITCH-HCELL), 0.0)), TEMP, , s08o000,
1465 NSOL, 17, (NODE(0.0, (-1.5*PITCH-SCCELL), 0.0)), TEMP, , a08o000,
1466 NSOL, 18, (NODE(0.0, (-2.0*PITCH), 0.0)), TEMP, , t18i000,
1467 NSOL, 19, (NODE(0.0, (-2.0*PITCH-ATWCL), 0.0)), TEMP, , a18i000,
1468 NSOL, 20, (NODE(0.0, (-2.0*PITCH-STWCL), 0.0)), TEMP, , s18i000,
1469 NSOL, 21, (NODE(0.0, (-2.0*PITCH-TQPC), 0.0)), TEMP, , h18i000,
1470 NSOL, 22, (NODE(0.0, (-2.5*PITCH), 0.0)), TEMP, , c18i000,
1471 NSOL, 23, (NODE(0.0, (-2.5*PITCH-QCELL), 0.0)), TEMP, , h18o000,
1472 NSOL, 24, (NODE(0.0, (-2.5*PITCH-HCELL), 0.0)), TEMP, , s18o000,
1473 NSOL, 25, (NODE(0.0, (-2.5*PITCH-SCCELL), 0.0)), TEMP, , a18o000,
1474 NSOL, 26, (NODE(0.0, (-3.0*PITCH), 0.0)), TEMP, , t24i000,
1475 NSOL, 27, (NODE(0.0, (-3.0*PITCH-ATWCL), 0.0)), TEMP, , a24i000,
1476 NSOL, 28, (NODE(0.0, (-3.0*PITCH-STWCL), 0.0)), TEMP, , s24i000,
1477 NSOL, 29, (NODE(0.0, (-3.0*PITCH-TQPC), 0.0)), TEMP, , h24i000,
1478 NSOL, 30, (NODE(0.0, (-3.5*PITCH), 0.0)), TEMP, , c24i000,
1479 NSOL, 31, (NODE(0.0, (-3.5*PITCH-QCELL), 0.0)), TEMP, , h24o000,
1480 NSOL, 32, (NODE(0.0, (-3.5*PITCH-HCELL), 0.0)), TEMP, , s24o000,
1481 NSOL, 33, (NODE(0.0, (-3.5*PITCH-SCCELL), 0.0)), TEMP, , t24o000,
1482 NSOL, 34, (NODE(0.0, (0.0-GY11+TPGPT), 0.0)), TEMP, , g24i000,
1483 NSOL, 35, (NODE(0.0, (0.0-GY11), 0.0)), TEMP, , g24o000,
1484 NSOL, 36, (NODE(0.0, (0.0-MIRAD), 0.0)), TEMP, , m24i000,
1485 NSOL, 37, (NODE(0.0, (0.0-MIRAD-MWALL), 0.0)), TEMP, , m24o000,
1486 NSOL, 38, (NODE(0.0, (OWALL+IWALL-DCRAD), 0.0)), TEMP, , i24i000,
1487 NSOL, 39, (NODE(0.0, (OWALL-DCRAD), 0.0)), TEMP, , i24o000,
1488 NSOL, 40, (NODE(0.0, (0.0-DCRAD), 0.0)), TEMP, , o24o000,
1489 PRVAR, 2, 3, 4, 5, 6, 7,
1490 PRVAR, 8, 9, 10, 11, 12, 13,
1491 PRVAR, 14, 15, 16, 17, 18, 19,
1492 PRVAR, 20, 21, 22, 23, 24, 25,
1493 PRVAR, 26, 27, 28, 29, 30, 31,
1494 PRVAR, 32, 33, 34, 35, 36, 37,
1495 PRVAR, 38, 39, 40,
1496 /COM,
1497 /COM, *****
1498 /COM, * Temperature Profile from center to lower right (45 deg.) *
1499 /COM, *****
1500 NSOL, 2, (NODE( 0.0, -OFFS, 0.0)), TEMP, , c02i045,
1501 NSOL, 3, (NODE( QCELL, (-OFFS-QCELL), 0.0)), TEMP, , h02o045,
1502 NSOL, 4, (NODE( HCELL, (-OFFS-HCELL), 0.0)), TEMP, , s02o045,
1503 NSOL, 5, (NODE( SCCELL, (-OFFS-SCCELL), 0.0)), TEMP, , a02o045,
1504 NSOL, 6, (NODE( ACELL, (-OFFS-ACCELL), 0.0)), TEMP, , t02o045,
1505 NSOL, 7, (NODE( (PITCH-ACCELL), (ACCELL-1.5*PITCH), 0.0)), TEMP, , t07i045,
1506 NSOL, 8, (NODE( (PITCH-SCCELL), (SCCELL-1.5*PITCH), 0.0)), TEMP, , a07i045,
1507 NSOL, 9, (NODE( (PITCH-HCELL), (HCELL-1.5*PITCH), 0.0)), TEMP, , s07i045,
1508 NSOL, 10, (NODE( (PITCH-QCELL), (QCELL-1.5*PITCH), 0.0)), TEMP, , h07i045,
1509 NSOL, 11, (NODE( PITCH, (-1.5*PITCH), 0.0)), TEMP, , c07i045,
1510 NSOL, 12, (NODE( (PITCH+QCELL), (-1.5*PITCH-QCELL), 0.0)), TEMP, , h07o045,
1511 NSOL, 13, (NODE( (PITCH+HCELL), (-1.5*PITCH-HCELL), 0.0)), TEMP, , s07o045,
1512 NSOL, 14, (NODE( (PITCH+SCCELL), (-1.5*PITCH-SCCELL), 0.0)), TEMP, , a07o045,
1513 NSOL, 15, (NODE( (PITCH+ACCELL), (-1.5*PITCH-ACCELL), 0.0)), TEMP, , t07o045,
1514 NSOL, 16, (NODE( (2.0*PITCH-ACCELL), (ACCELL-2.5*PITCH), 0.0)), TEMP, , t16i045,
1515 NSOL, 17, (NODE( (2.0*PITCH-SCCELL), (SCCELL-2.5*PITCH), 0.0)), TEMP, , a16i045,
1516 NSOL, 18, (NODE( (2.0*PITCH-HCELL), (HCELL-2.5*PITCH), 0.0)), TEMP, , s16i045,
1517 NSOL, 19, (NODE( (2.0*PITCH-QCELL), (QCELL-2.5*PITCH), 0.0)), TEMP, , h16i045,
1518 NSOL, 20, (NODE( (2.0*PITCH), (-2.5*PITCH), 0.0)), TEMP, , c16i045,
1519 NSOL, 21, (NODE( (2.0*PITCH+QCELL), (-2.5*PITCH-QCELL), 0.0)), TEMP, , h16o045,
1520 NSOL, 22, (NODE( (2.0*PITCH+HCELL), (-2.5*PITCH-HCELL), 0.0)), TEMP, , s16o045,

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1521 NSOL,23,(NODE((2.0*PITCH+SCELL), (-2.5*PITCH-SCELL),0.0)),TEMP,,a16o045,
1522 NSOL,24,(NODE((2.0*PITCH+ACELL), (-2.5*PITCH-ACELL),0.0)),TEMP,,t16o045,
1523 NSOL,25,(NODE(      (GX32-GWALL),      (0.0-GY24+SGCD1),0.0)),TEMP,,g16i045,
1524 NSOL,26,(NODE(      MI45,      (-1.0*MI45),0.0)),TEMP,,m16i045,
1525 NSOL,27,(NODE(      MO45,      (-1.0*MO45),0.0)),TEMP,,m16o045,
1526 NSOL,28,(NODE(      DI45,      (-1.0*DI45),0.0)),TEMP,,i16i045,
1527 NSOL,29,(NODE(      DM45,      (-1.0*DM45),0.0)),TEMP,,i16o045,
1528 NSOL,30,(NODE(      DO45,      (-1.0*DO45),0.0)),TEMP,,o16o045,
1529 /COM,      Add centers of assemblies 6, 14, 15, 17, 22, 23
1530 NSOL,31,(NODE(      (1.0*PITCH),      (-0.5*PITCH),0.0)),TEMP,,c06i045,
1531 NSOL,32,(NODE(      (2.0*PITCH),      (-0.5*PITCH),0.0)),TEMP,,c14i045,
1532 NSOL,33,(NODE(      (2.0*PITCH),      (-1.5*PITCH),0.0)),TEMP,,c15i045,
1533 NSOL,34,(NODE(      (1.0*PITCH),      (-2.5*PITCH),0.0)),TEMP,,c17i045,
1534 NSOL,35,(NODE(      (3.0*PITCH),      (-0.5*PITCH),0.0)),TEMP,,c22i045,
1535 NSOL,36,(NODE(      (3.0*PITCH),      (-1.5*PITCH),0.0)),TEMP,,c23i045,
1536 PRVAR, 2, 3, 4, 5, 6, 7,
1537 PRVAR, 8, 9,10,11,12,13,
1538 PRVAR,14,15,16,17,18,19,
1539 PRVAR,20,21,22,23,24,25,
1540 PRVAR,26,27,28,29,30,31,
1541 PRVAR,32,33,34,35,36,
1542 /COM,
1543 /COM,      *****
1544 /COM,      *      Temperature Profile from center to side of WP (90 deg.)      *
1545 /COM,      *****
1546 NSOL, 2,(NODE(      0.0,0.0,0.0)),TEMP,,c01i090,
1547 NSOL, 3,(NODE(      QCELL,0.0,0.0)),TEMP,,h01o090,
1548 NSOL, 4,(NODE(      HCELL,0.0,0.0)),TEMP,,s01o090,
1549 NSOL, 5,(NODE(      SCELL,0.0,0.0)),TEMP,,a01o090,
1550 NSOL, 6,(NODE(      ACELL,0.0,0.0)),TEMP,,t01o090,
1551 NSOL, 7,(NODE(      (PITCH-ACELL),0.0,0.0)),TEMP,,t05i090,
1552 NSOL, 8,(NODE(      (PITCH-SCELL),0.0,0.0)),TEMP,,a05i090,
1553 NSOL, 9,(NODE(      (PITCH-HCELL),0.0,0.0)),TEMP,,s05i090,
1554 NSOL,10,(NODE(      (PITCH-QCELL),0.0,0.0)),TEMP,,h05i090,
1555 NSOL,11,(NODE(      PITCH,0.0,0.0)),TEMP,,c05i090,
1556 NSOL,12,(NODE(      (PITCH+QCELL),0.0,0.0)),TEMP,,h05o090,
1557 NSOL,13,(NODE(      (PITCH+HCELL),0.0,0.0)),TEMP,,s05o090,
1558 NSOL,14,(NODE(      (PITCH+SCELL),0.0,0.0)),TEMP,,a05o090,
1559 NSOL,15,(NODE(      (PITCH+ACELL),0.0,0.0)),TEMP,,t05i090,
1560 NSOL,16,(NODE(      (2.0*PITCH-ACELL),0.0,0.0)),TEMP,,t13i090,
1561 NSOL,17,(NODE(      (2.0*PITCH-SCELL),0.0,0.0)),TEMP,,a13i090,
1562 NSOL,18,(NODE(      (2.0*PITCH-HCELL),0.0,0.0)),TEMP,,s13i090,
1563 NSOL,19,(NODE(      (2.0*PITCH-QCELL),0.0,0.0)),TEMP,,h13i090,
1564 NSOL,20,(NODE(      (2.0*PITCH),0.0,0.0)),TEMP,,c13i090,
1565 NSOL,21,(NODE(      (2.0*PITCH+QCELL),0.0,0.0)),TEMP,,h13o090,
1566 NSOL,22,(NODE(      (2.0*PITCH+HCELL),0.0,0.0)),TEMP,,s13o090,
1567 NSOL,23,(NODE(      (2.0*PITCH+SCELL),0.0,0.0)),TEMP,,a13o090,
1568 NSOL,26,(NODE(      (2.0*PITCH-ACELL),0.0,0.0)),TEMP,,t13i090,
1569 NSOL,27,(NODE(      (3.0*PITCH-ACELL),0.0,0.0)),TEMP,,t21i090,
1570 NSOL,28,(NODE(      (3.0*PITCH-SCELL),0.0,0.0)),TEMP,,a21i090,
1571 NSOL,29,(NODE(      (3.0*PITCH-HCELL),0.0,0.0)),TEMP,,s21i090,
1572 NSOL,30,(NODE(      (3.0*PITCH-QCELL),0.0,0.0)),TEMP,,h21i090,
1573 NSOL,31,(NODE(      (3.0*PITCH),0.0,0.0)),TEMP,,c21i090,
1574 NSOL,32,(NODE(      (3.0*PITCH+QCELL),0.0,0.0)),TEMP,,h21o090,
1575 NSOL,33,(NODE(      (3.0*PITCH+HCELL),0.0,0.0)),TEMP,,s21o090,
1576 NSOL,34,(NODE(      (3.0*PITCH+SCELL),0.0,0.0)),TEMP,,t21o090,
1577 NSOL,35,(NODE(      (GX44-GWALL),0.0,0.0)),TEMP,,g04i090,
1578 NSOL,36,(NODE(      GX44,0.0,0.0)),TEMP,,g04o090,
1579 NSOL,37,(NODE(      MIRAD,0.0,0.0)),TEMP,,m04i090,
1580 NSOL,38,(NODE(      (MIRAD+MWALL),0.0,0.0)),TEMP,,m04o090,
1581 NSOL,39,(NODE(      (DCRAD-OWALL-IWALL),0.0,0.0)),TEMP,,i04i090,
1582 NSOL,40,(NODE(      (DCRAD-OWALL),0.0,0.0)),TEMP,,i04o090,
1583 NSOL,41,(NODE(      DCRAD,0.0,0.0)),TEMP,,o04o090,
1584 PRVAR, 2, 3, 4, 5, 6, 7,
1585 PRVAR, 8, 9,10,11,12,13,
1586 PRVAR,14,15,16,17,18,19,
1587 PRVAR,20,21,22,23,24,25,
1588 PRVAR,26,27,28,29,30,31,
1589 PRVAR,32,33,34,35,36,37,
1590 PRVAR,38,39,40,41,

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1591 /COM,
1592 /COM, *****
1593 /COM, * Temperature Profile from center to upper right (135 deg.) *
1594 /COM, *****
1595 NSOL, 2, (NODE( 0.0, OFFS, 0.0)), TEMP, ,c01i135,
1596 NSOL, 3, (NODE( QCELL, (OFFS+QCELL), 0.0)), TEMP, ,h01o135,
1597 NSOL, 4, (NODE( HCELL, (OFFS+HCELL), 0.0)), TEMP, ,s01o135,
1598 NSOL, 5, (NODE( SCELL, (OFFS+SCELL), 0.0)), TEMP, ,a01o135,
1599 NSOL, 6, (NODE( ACELL, (OFFS+ACELL), 0.0)), TEMP, ,t01o135,
1600 NSOL, 7, (NODE( (PITCH-ACELL), (1.5*PITCH-ACELL), 0.0)), TEMP, ,t04i135,
1601 NSOL, 8, (NODE( (PITCH-SCELL), (1.5*PITCH-SCELL), 0.0)), TEMP, ,a04i135,
1602 NSOL, 9, (NODE( (PITCH-HCELL), (1.5*PITCH-HCELL), 0.0)), TEMP, ,s04i135,
1603 NSOL, 10, (NODE( (PITCH-QCELL), (1.5*PITCH-QCELL), 0.0)), TEMP, ,h04i135,
1604 NSOL, 11, (NODE( PITCH, (1.5*PITCH), 0.0)), TEMP, ,c04i135,
1605 NSOL, 12, (NODE( (PITCH+QCELL), (1.5*PITCH+QCELL), 0.0)), TEMP, ,h04o135,
1606 NSOL, 13, (NODE( (PITCH+HCELL), (1.5*PITCH+HCELL), 0.0)), TEMP, ,s04o135,
1607 NSOL, 14, (NODE( (PITCH+SCELL), (1.5*PITCH+SCELL), 0.0)), TEMP, ,a04o135,
1608 NSOL, 15, (NODE( (PITCH+ACELL), (1.5*PITCH+ACELL), 0.0)), TEMP, ,t04o135,
1609 NSOL, 16, (NODE( (2.0*PITCH-ACELL), (2.5*PITCH-ACELL), 0.0)), TEMP, ,t11i135,
1610 NSOL, 17, (NODE( (2.0*PITCH-SCELL), (2.5*PITCH-SCELL), 0.0)), TEMP, ,a11i135,
1611 NSOL, 18, (NODE( (2.0*PITCH-HCELL), (2.5*PITCH-HCELL), 0.0)), TEMP, ,s11i135,
1612 NSOL, 19, (NODE( (2.0*PITCH-QCELL), (2.5*PITCH-QCELL), 0.0)), TEMP, ,h11i135,
1613 NSOL, 20, (NODE( (2.0*PITCH), (2.5*PITCH), 0.0)), TEMP, ,c11i135,
1614 NSOL, 21, (NODE( (2.0*PITCH+QCELL), (2.5*PITCH+QCELL), 0.0)), TEMP, ,h11o135,
1615 NSOL, 22, (NODE( (2.0*PITCH+HCELL), (2.5*PITCH+HCELL), 0.0)), TEMP, ,s11o135,
1616 NSOL, 23, (NODE( (2.0*PITCH+SCELL), (2.5*PITCH+SCELL), 0.0)), TEMP, ,a11o135,
1617 NSOL, 24, (NODE( (2.0*PITCH+ACELL), (2.5*PITCH+ACELL), 0.0)), TEMP, ,t11o135,
1618 NSOL, 25, (NODE( (GX32-GWALL), (GY24-SGCD1), 0.0)), TEMP, ,g11i135,
1619 NSOL, 26, (NODE( MI45, (1.0*MI45), 0.0)), TEMP, ,m11i135,
1620 NSOL, 27, (NODE( MO45, (1.0*MO45), 0.0)), TEMP, ,m11o135,
1621 NSOL, 28, (NODE( DI45, (1.0*DI45), 0.0)), TEMP, ,i11i135,
1622 NSOL, 29, (NODE( DM45, (1.0*DM45), 0.0)), TEMP, ,i11o135,
1623 NSOL, 30, (NODE( DO45, (1.0*DO45), 0.0)), TEMP, ,o11o135,
1624 /COM, Add centers of assemblies 5, 10, 12, 13, 20, 21
1625 NSOL, 31, (NODE( (1.0*PITCH), (0.5*PITCH), 0.0)), TEMP, ,c06i135,
1626 NSOL, 32, (NODE( (1.0*PITCH), (0.5*PITCH), 0.0)), TEMP, ,c14i135,
1627 NSOL, 33, (NODE( (2.0*PITCH), (0.5*PITCH), 0.0)), TEMP, ,c15i135,
1628 NSOL, 34, (NODE( (2.0*PITCH), (1.5*PITCH), 0.0)), TEMP, ,c17i135,
1629 NSOL, 35, (NODE( (3.0*PITCH), (0.5*PITCH), 0.0)), TEMP, ,c22i135,
1630 NSOL, 36, (NODE( (3.0*PITCH), (1.5*PITCH), 0.0)), TEMP, ,c23i135,
1631 PRVAR, 2, 3, 4, 5, 6, 7,
1632 PRVAR, 8, 9, 10, 11, 12, 13,
1633 PRVAR, 14, 15, 16, 17, 18, 19,
1634 PRVAR, 20, 21, 22, 23, 24, 25,
1635 PRVAR, 26, 27, 28, 29, 30, 31,
1636 PRVAR, 32, 33, 34, 35, 36,
1637 /COM,
1638 /COM, *****
1639 /COM, * Temperature Profile from center to top of WP (180 deg.) *
1640 /COM, *****
1641 NSOL, 2, (NODE(0.0, 0.0, 0.0)), TEMP, ,t02i000,
1642 NSOL, 3, (NODE(0.0, (ATWCL), 0.0)), TEMP, ,a02i000,
1643 NSOL, 4, (NODE(0.0, (STWCL), 0.0)), TEMP, ,s02i000,
1644 NSOL, 5, (NODE(0.0, (STWCL+QCELL), 0.0)), TEMP, ,h02i000,
1645 NSOL, 6, (NODE(0.0, (0.5*PITCH), 0.0)), TEMP, ,c02i000,
1646 NSOL, 7, (NODE(0.0, (0.5*PITCH+QCELL), 0.0)), TEMP, ,h02o000,
1647 NSOL, 8, (NODE(0.0, (0.5*PITCH+HCELL), 0.0)), TEMP, ,s02o000,
1648 NSOL, 9, (NODE(0.0, (0.5*PITCH+SCELL), 0.0)), TEMP, ,a02o000,
1649 NSOL, 10, (NODE(0.0, (1.0*PITCH), 0.0)), TEMP, ,t08i000,
1650 NSOL, 11, (NODE(0.0, (1.0*PITCH+ATWCL), 0.0)), TEMP, ,a08i000,
1651 NSOL, 12, (NODE(0.0, (1.0*PITCH+STWCL), 0.0)), TEMP, ,s08i000,
1652 NSOL, 13, (NODE(0.0, (1.0*PITCH+TQPCL), 0.0)), TEMP, ,h08i000,
1653 NSOL, 14, (NODE(0.0, (1.5*PITCH), 0.0)), TEMP, ,c08i000,
1654 NSOL, 15, (NODE(0.0, (1.5*PITCH+QCELL), 0.0)), TEMP, ,h08o000,
1655 NSOL, 16, (NODE(0.0, (1.5*PITCH+HCELL), 0.0)), TEMP, ,s08o000,
1656 NSOL, 17, (NODE(0.0, (1.5*PITCH+SCELL), 0.0)), TEMP, ,a08o000,
1657 NSOL, 18, (NODE(0.0, (2.0*PITCH), 0.0)), TEMP, ,t18i000,
1658 NSOL, 19, (NODE(0.0, (2.0*PITCH+ATWCL), 0.0)), TEMP, ,a18i000,
1659 NSOL, 20, (NODE(0.0, (2.0*PITCH+STWCL), 0.0)), TEMP, ,s18i000,
1660 NSOL, 21, (NODE(0.0, (2.0*PITCH+TQPCL), 0.0)), TEMP, ,h18i000,

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1661 NSOL,22,(NODE(0.0, (2.5*PITCH),0.0)),TEMP,,c18i000,
1662 NSOL,23,(NODE(0.0, (2.5*PITCH+QCELL),0.0)),TEMP,,h18o000,
1663 NSOL,24,(NODE(0.0, (2.5*PITCH+HCELL),0.0)),TEMP,,s18o000,
1664 NSOL,25,(NODE(0.0, (2.5*PITCH+SCELL),0.0)),TEMP,,a18o000,
1665 NSOL,26,(NODE(0.0, (3.0*PITCH),0.0)),TEMP,,t24i000,
1666 NSOL,27,(NODE(0.0, (3.0*PITCH+ATWCL),0.0)),TEMP,,a24i000,
1667 NSOL,28,(NODE(0.0, (3.0*PITCH+STWCL),0.0)),TEMP,,s24i000,
1668 NSOL,29,(NODE(0.0, (3.0*PITCH+TPCL),0.0)),TEMP,,h24i000,
1669 NSOL,30,(NODE(0.0, (3.5*PITCH),0.0)),TEMP,,c24i000,
1670 NSOL,31,(NODE(0.0, (3.5*PITCH+QCELL),0.0)),TEMP,,h24o000,
1671 NSOL,32,(NODE(0.0, (3.5*PITCH+HCELL),0.0)),TEMP,,s24o000,
1672 NSOL,33,(NODE(0.0, (3.5*PITCH+SCELL),0.0)),TEMP,,t24o000,
1673 NSOL,34,(NODE(0.0, (GY11-TPGPT),0.0)),TEMP,,g24i000,
1674 NSOL,35,(NODE(0.0, (GY11),0.0)),TEMP,,g24o000,
1675 NSOL,36,(NODE(0.0, (MIRAD),0.0)),TEMP,,m24i000,
1676 NSOL,37,(NODE(0.0, (MIRAD+MWALL),0.0)),TEMP,,m24o000,
1677 NSOL,38,(NODE(0.0, (DCRAD-OWALL-IWALL),0.0)),TEMP,,i24i000,
1678 NSOL,39,(NODE(0.0, (DCRAD-OWALL),0.0)),TEMP,,i24o000,
1679 NSOL,40,(NODE(0.0, (DCRAD),0.0)),TEMP,,o24o000,
1680 PRVAR, 2, 3, 4, 5, 6, 7,
1681 PRVAR, 8, 9,10,11,12,13,
1682 PRVAR,14,15,16,17,18,19,
1683 PRVAR,20,21,22,23,24,25,
1684 PRVAR,26,27,28,29,30,31,
1685 PRVAR,32,33,34,35,36,37,
1686 PRVAR,38,39,40,
1687 FINISH
1688 /COM, *****
1689 /COM, End of batch input file
1690 /COM, *****
1691 /EXIT,
1692 /EOF

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

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

ABBREVIATION= REPLOT /REPLOT

PARAMETER PI = 3.141593

ANSYS STARTUP FILE start.ans

ABBREVIATION= VEC /show,,1,

ABBREVIATION= RAS /show,,0,

ABBREVIATION= INP /input,,inp,

ABBREVIATION= ESC /exit,nosav,

ABBREVIATION= K1 /pnum,kp ,1,

ABBREVIATION= K0 /pnum,kp ,0,

ABBREVIATION= L1 /pnum,line,1,

ABBREVIATION= L0 /pnum,line,0,

ABBREVIATION= A1 /pnum,area,1,

ABBREVIATION= A0 /pnum,area,0,

ABBREVIATION= V1 /pnum,volu,1,

ABBREVIATION= V0 /pnum,volu,0,

ABBREVIATION= N1 /pnum,node,1,

ABBREVIATION= NO /pnum,node,0,
 ABBREVIATION= E1 /pnum,elem,1,
 ABBREVIATION= E0 /pnum,elem,0,
 ABBREVIATION= M1 /pnum,mat ,1,
 ABBREVIATION= M0 /pnum,mat ,0,
 ABBREVIATION= R1 /pnum,real,1,
 ABBREVIATION= R0 /pnum,real,0,
 ABBREVIATION= T1 /pnum,type,1,
 ABBREVIATION= T0 /pnum,type,0,
 ABBREVIATION= C1 /number,1,
 ABBREVIATION= C0 /number,0,
 ABBREVIATION= PR1 /psf,pres,norm,1,
 ABBREVIATION= PRO /psf,pres,norm,0,
 ABBREVIATION= U1 /pbc,u,1,
 ABBREVIATION= U0 /pbc,u,0,
 ABBREVIATION= X3D /show,3d,
 ABBREVIATION= X11 /show,x11,
 ABBREVIATION= X11C /show,x11c,
 ABBREVIATION= ON /menu,on,
 XYZ TRIAD DISPLAY SET TO OFF

VIEW CONE ANGLE FOR WINDOW 1 25.00

 END start.ans

To start ANSYS menu:

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

type: on

 ANSYS REVISION 5.1 06/24/1996
 2-D Model 40 BWR MOX MPC Thermal Analysis H.Wang

 * *
 * File name: 40moxmpc.inp *
 * 40 BWR MPC with High T.L. Disposal Container *
 * Helium Fill Gas *
 * *
 * Material Property file: props01.dat *
 * *
 * BWR SNF Conductivity file: bwr8ke.dat *
 * GE-5 8x8 SNF Assembly *
 * *
 * SNF Heat Loads file: bwrmox1.dat *
 * SNF Type: 10 years old, 36.7 Gwd/MTU *
 * *

```
* 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

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

Work space must also be increased (-m 64)

TITLE=

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

SI UNITS SPECIFIED FOR INTERNAL

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

INPUT UNITS ARE ALSO SET TO SI

Define Transient time parameters

```
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
```

PARAMETER TM_START = 31.55760

PARAMETER TMI0 = 3155760.

PARAMETER TMI1 = 0.3155760E+08

PARAMETER TMI10 = 0.3155760E+09

PARAMETER TMI100 = 0.3155760E+10

PARAMETER TMI1000 = 0.3155760E+11

PARAMETER TME0 = 0.2840187E+08

PARAMETER TME1 = 0.3155763E+08

PARAMETER TME9 = 0.2840184E+09

PARAMETER TME10 = 0.3155760E+09

PARAMETER TME50 = 0.1577880E+10

PARAMETER TME90 = 0.2840184E+10

PARAMETER TME100 = 0.3155760E+10

PARAMETER TME1000 = 0.3155760E+11

Read in average effective conductivities from SNF model
 PARRES,CHANGE,b8hel8c,parm,
 Read in surface temps. from repository model

*** NOTE *** CP= 0.460 TIME= 09:22:26
 Restore ANSYS parameters from file= c21x5a.parm.

/INPUT FILE= c21x5a.parm LINE= 0

PRINTOUT RESUMED BY /GOP

Define MPC/waste package parameters
 (MPC dimensions converted from inches to meters)
 Required Constants:

PARAMETER PI = 3.141593

Required container wall parameters:

MIRAD = inner radius of MPC shell (m)
 MWALL = MPC shell thickness (m)
 DCRAD = disposal container outer radius (m)
 OWALL = outer barrier thickness (m)
 IWALL = inner barrier thickness (m)

PARAMETER MIRAD = 0.7404100

PARAMETER MWALL = 0.2540000E-01

PARAMETER DCRAD = 0.9008000

PARAMETER OWALL = 0.1000000

PARAMETER IWALL = 0.2000000E-01

Required outer guide hardware parameters:

Set 1: TPGPL = top/bottom guide plate length (m)
 TPGPT = top/bottom guide plate thickness (m)

PARAMETER TPGPL = 0.1606296

PARAMETER TPGPT = 0.6350000E-02

Set 2: SGCCW = Width; corner guide to far corner side guide (m)
 SGCMW = Width; Side guide corner to Middle side guide (m)
 SGCD1 = Vert. Dist. Down to Corner of Guide (m)

PARAMETER SGCCW = 0.5367528

PARAMETER SGCMW = 0.1722374

PARAMETER SGCD1 = 0.1772666

SET 3: GCORV = corner guide Vertical width (m)
 GCORH = corner guide Horizontal width (m)
 GX32 = X coord. of upper contact from drawing. (m)
 GY32 = Y coord. of upper contact from drawing. (m)

PARAMETER GCORV = 0.1971040

PARAMETER GCORH = 0.1705864

PARAMETER GX32 = 0.4739989

PARAMETER GY32 = 0.5687987

SET 4: GLEN1 = side guide Low width (m)
 GLEN2 = side guide High width (m)
 GLENT = side guide total width (m)
 GWALL = guide thickness (m)

PARAMETER GLEN1 = 0.1709166
 PARAMETER GLEN2 = 0.3539998
 PARAMETER GLENT = 0.7331964
 PARAMETER GWALL = 0.9525000E-02

Required Tube/Fuel parameters:

HCELL = 1/2 of basket cell opening (m)
 SWALL = stainless tube thickness (m)
 AWALL = Al/boron tube thickness (m)
 TWALL = stainless tube cladding thickness (m)
 ACTVL = active fuel length
 PEAKF = assembly heat axial peaking factor

PARAMETER HCELL = 0.7620000E-01
 PARAMETER SWALL = 0.6350000E-02
 PARAMETER AWALL = 0.6350000E-02
 PARAMETER TWALL = 0.2387600E-02
 PARAMETER ACTVL = 3.810000
 PARAMETER PEAKF = 1.400000

Define calculated parameters

ASSY = assembly heat production (W) f(yrs)
 FUEL = volumetric heat production (W/m3) f(yrs)
 FVOLL = assy_volume=cell_width^2*active_length
 PITCH = basket cell outer width (m)
 QCELL = 1/4 of basket cell opening (m)
 SCELL = 1/2 of basket cell opening+SS wall(m)
 ACELL = 1/2 of basket cell opening+SS+AL (m)
 ATWCL = Dist. to edge of B-AL plate (m)
 STWCL = Dist. to edge of Steel Bask. Plate (m)
 TQPCL = Top quarter of cell dist. (m)

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

PARAMETER FVOLL = 0.8849015E-01
 PARAMETER PITCH = 0.1825752
 PARAMETER QCELL = 0.3810000E-01
 PARAMETER SCELL = 0.8255000E-01
 PARAMETER ACELL = 0.8890000E-01
 PARAMETER ATWCL = 0.8737600E-02
 PARAMETER STWCL = 0.1508760E-01
 PARAMETER TQPCL = 0.5318760E-01

Determine the required contact points for the outer guide hardware

GX## = x coord. of guide/shell contact

GY## = y coord. of guide/shell contact

Set 1:

PARAMETER GX11 = 0.8031480E-01

PARAMETER GY11 = 0.7360411

Set 3:

PARAMETER GX31 = 0.6350603

PARAMETER GY31 = 0.3812197

Set 2:

PARAMETER GX24 = 0.9830753E-01

PARAMETER GY24 = 0.7338546

PARAMETER GX23 = 0.1078325

PARAMETER GY23 = 0.7325156

PARAMETER GX22 = 0.2705449

PARAMETER GY22 = 0.6892114

PARAMETER GX21 = 0.2800699

PARAMETER GY21 = 0.6853961

Set 4:

PARAMETER GY41 = 0.4762500E-02

PARAMETER GX41 = 0.7403947

PARAMETER GY44 = 0.3587623

PARAMETER GX44 = 0.6476856

PARAMETER GY43 = 0.1878457

PARAMETER GX43 = 0.7161850

PARAMETER GY42 = 0.1783207

PARAMETER GX42 = 0.7186158

Define 45 degree point of reference:

MI45 = x coord. MIRAD at 45 deg.

MO45 = x coord. MIRAD+MWALL at 45 deg.

DI45 = x coord. DCRAD-OWALL-IWALL at 45 deg.

DM45 = x coord. DCRAD-OWALL at 45 deg.

DO45 = x coord. DCRAD at 45 deg.

OFFS = 45 degree Y off set to go through centers

PARAMETER MI45 = 0.5235489

PARAMETER MO45 = 0.5415094

PARAMETER DI45 = 0.5521090

PARAMETER DM45 = 0.5662511

PARAMETER DO45 = 0.6369618

PARAMETER OFFS = 0.9128760E-01

Define different element types

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 09:22:27 JUN 26, 1996 CP= 1.050
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

***** 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 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 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 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

File props01.dat describes material properties
 and thier reference numbers

READ IN MATERIAL PROPERTY LIBRARY FROM FILE= props01.dat

/INPUT FILE= props01.dat LINE= 0

```

**      ANSYS 5.0 MPC MATERIAL PROPERTY TABLES      **
*****
**      Filename: props01.dat                        **
**      Compiled by R. Bahney III on 1-30-95          **
*****

```

NUMBER	MATERIAL	DESCRIPTION
1	Stainless Steel 316	Basket Structural Support
2	Incaloy 825	Inner Container (resistant)
3	A516 Mild Steel	Outer Container (allowance)
4	UO2 Pellet	SNF Uranium Oxide Pellet
5	Zircaloy 4	SNF Cladding
6	Oxidation Layer	Stably Oxidized Zircaloy Surface
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

TEMPERATURE TABLE ERASED.

```

*** PROPERTY TEMPERATURE TABLE    NUM. TEMPS= 1 ***
SLOC= 1    0.0000000E+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    10970.00

```

```

PROPERTY TABLE DENS  MAT= 5  NUM. POINTS= 1
SLOC= 1    6500.000

```

```

PROPERTY TABLE DENS  MAT= 6  NUM. POINTS= 1
SLOC= 1    6500.000

```

```

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    0.6000000

```

```

PROPERTY TABLE EMIS  MAT= 2  NUM. POINTS= 1
SLOC= 1    0.8000000

```

PROPERTY TABLE EMIS MAT= 3 NUM. POINTS= 1
SLOC= 1 0.8000000

PROPERTY TABLE EMIS MAT= 4 NUM. POINTS= 1
SLOC= 1 0.7900000

PROPERTY TABLE EMIS MAT= 5 NUM. POINTS= 1
SLOC= 1 0.8060000

PROPERTY TABLE EMIS MAT= 6 NUM. POINTS= 1
SLOC= 1 0.8060000

PROPERTY TABLE EMIS MAT= 11 NUM. POINTS= 1
SLOC= 1 0.7000000E-01

PROPERTY TABLE EMIS MAT= 12 NUM. POINTS= 1
SLOC= 1 0.5000000

PROPERTY TABLE EMIS MAT= 13 NUM. POINTS= 1
SLOC= 1 0.7000000E-01

Define specific heat for matl. 4, 5, 6, 7, 11, 14, 15

PROPERTY TABLE C MAT= 4 NUM. POINTS= 1
SLOC= 1 247.0000

PROPERTY TABLE C MAT= 5 NUM. POINTS= 1
SLOC= 1 330.0000

PROPERTY TABLE C MAT= 6 NUM. POINTS= 1
SLOC= 1 330.0000

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 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
	14.02000	14.54000	13.67000

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

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

PROPERTY TABLE KXX MAT= 2 NUM. POINTS= 24			
SLOC= 19	19.73000	20.08000	20.42000
	21.46000	21.98000	20.94000

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
	498.1200	520.4500	504.6500

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

PROPERTY TABLE C MAT= 2 NUM. POINTS= 17			

SLOC= 13 619.5800 636.7600 654.2000 678.2500
696.2900

Define K for materials 4, 5, 6

TEMPERATURE TABLE ERASED.

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

SLOC= 1 0.0000000E+00 10.00000 20.00000
30.00000 40.00000 50.00000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***

SLOC= 7 60.00000 70.00000 80.00000
90.00000 100.0000 110.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 18 ***

SLOC= 13 120.0000 130.0000 140.0000
150.0000 160.0000 170.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 24 ***

SLOC= 19 180.0000 190.0000 200.0000
210.0000 220.0000 230.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 30 ***

SLOC= 25 240.0000 250.0000 260.0000
270.0000 280.0000 290.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 36 ***

SLOC= 31 300.0000 310.0000 320.0000
330.0000 340.0000 350.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 42 ***

SLOC= 37 360.0000 370.0000 380.0000
390.0000 400.0000 410.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 48 ***

SLOC= 43 420.0000 430.0000 440.0000
450.0000 460.0000 470.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 50 ***

SLOC= 48 480.0000 490.0000 500.0000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 6
SLOC= 1 8.720000 8.540000 8.360000 8.190000
8.030000 7.870000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 12
SLOC= 7 7.720000 7.580000 7.440000 7.310000
7.180000 7.050000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 18
SLOC= 13 6.930000 6.820000 6.700000 6.600000
6.490000 6.390000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 24
SLOC= 19 6.290000 6.190000 6.100000 6.010000
5.920000 5.840000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 30
SLOC= 25 5.760000 5.680000 5.600000 5.520000
5.450000 5.380000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 36
SLOC= 31 5.310000 5.240000 5.180000 5.110000
5.050000 4.990000

PROPERTY TABLE KXX MAT= 4 NUM. POINTS= 42
SLOC= 37 4.930000 4.870000 4.810000 4.760000
4.700000 4.650000

PROPERTY TABLE KXX	MAT=	4	NUM. POINTS=	48	
SLOC= 43	4.600000	4.550000	4.500000		4.450000
	4.400000	4.350000			
PROPERTY TABLE KXX	MAT=	4	NUM. POINTS=	50	
SLOC= 48	4.310000	4.270000	4.220000		
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	6	
SLOC= 1	12.29000	12.44000	12.58000		12.72000
	12.87000	13.01000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	12	
SLOC= 7	13.15000	13.28000	13.42000		13.55000
	13.69000	13.82000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	18	
SLOC= 13	13.95000	14.08000	14.21000		14.34000
	14.46000	14.59000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	24	
SLOC= 19	14.72000	14.84000	14.96000		15.09000
	15.21000	15.33000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	30	
SLOC= 25	15.45000	15.57000	15.69000		15.81000
	15.93000	16.05000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	36	
SLOC= 31	16.17000	16.29000	16.40000		16.52000
	16.64000	16.76000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	42	
SLOC= 37	16.88000	16.99000	17.11000		17.23000
	17.35000	17.46000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	48	
SLOC= 43	17.58000	17.70000	17.82000		17.94000
	18.06000	18.18000			
PROPERTY TABLE KXX	MAT=	5	NUM. POINTS=	50	
SLOC= 48	18.30000	18.42000	18.54000		
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	6	
SLOC= 1	1.940000	1.940000	1.940000		1.940000
	1.940000	1.940000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	12	
SLOC= 7	1.940000	1.950000	1.950000		1.950000
	1.950000	1.950000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	18	
SLOC= 13	1.950000	1.950000	1.960000		1.960000
	1.960000	1.960000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	24	
SLOC= 19	1.960000	1.970000	1.970000		1.970000
	1.970000	1.980000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	30	
SLOC= 25	1.980000	1.980000	1.980000		1.990000
	1.990000	1.990000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	36	
SLOC= 31	2.000000	2.000000	2.000000		2.010000
	2.010000	2.010000			
PROPERTY TABLE KXX	MAT=	6	NUM. POINTS=	42	
SLOC= 37	2.020000	2.020000	2.020000		2.030000
	2.030000	2.030000			

PROPERTY TABLE KXX MAT= 6 NUM. POINTS= 48
 SLOC= 43 2.040000 2.040000 2.040000 2.050000
 2.050000 2.060000

PROPERTY TABLE KXX MAT= 6 NUM. POINTS= 50
 SLOC= 48 2.060000 2.060000 2.070000

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 0.1875000 0.1750000 0.1625000 0.1422000
 0.1219000 0.1097000

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 12
 SLOC= 7 0.9750000E-01 0.9060000E-01 0.8360000E-01 0.7670000E-01
 0.6970000E-01 0.6620000E-01

PROPERTY TABLE DENS MAT= 7 NUM. POINTS= 15
 SLOC= 13 0.6270000E-01 0.5580000E-01 0.4880000E-01

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 6
 SLOC= 1 0.1370000 0.1450000 0.1520000 0.1700000
 0.1870000 0.2040000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 12
 SLOC= 7 0.2200000 0.2360000 0.2520000 0.2640000
 0.2780000 0.2910000

PROPERTY TABLE KXX MAT= 7 NUM. POINTS= 15
 SLOC= 13 0.3040000 0.3300000 0.3540000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 6
 SLOC= 1 1.348000 1.254700 1.161400 0.9950000
 0.8711000 0.7740000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 12
 SLOC= 7 0.6964000 0.6329000 0.5804000 0.5356000
 0.4975000 0.4643000

PROPERTY TABLE DENS MAT= 8 NUM. POINTS= 15
 SLOC= 13 0.4354000 0.3868000 0.3482000

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 6
 SLOC= 1 0.2300000E-01 0.2500000E-01 0.2600000E-01 0.3000000E-01
 0.3400000E-01 0.3700000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 12
 SLOC= 7 0.4100000E-01 0.4400000E-01 0.4700000E-01 0.5000000E-01
 0.5200000E-01 0.5500000E-01

PROPERTY TABLE KXX MAT= 8 NUM. POINTS= 15
 SLOC= 13 0.5700000E-01 0.6200000E-01 0.6700000E-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	0.9625000
	0.8425000	0.7485000		
PROPERTY TABLE DENS	MAT=	9	NUM. POINTS=	12
SLOC= 7	0.6739000	0.6124000	0.5615000	0.5214000
	0.4812000	0.4512000		
PROPERTY TABLE DENS	MAT=	9	NUM. POINTS=	15
SLOC= 13	0.4211000	0.3743000	0.3368000	
PROPERTY TABLE KXX	MAT=	9	NUM. POINTS=	6
SLOC= 1	0.2300000E-01	0.2400000E-01	0.2600000E-01	0.2900000E-01
	0.3300000E-01	0.3600000E-01		
PROPERTY TABLE KXX	MAT=	9	NUM. POINTS=	12
SLOC= 7	0.3900000E-01	0.4200000E-01	0.4500000E-01	0.4700000E-01
	0.5000000E-01	0.5200000E-01		
PROPERTY TABLE KXX	MAT=	9	NUM. POINTS=	15
SLOC= 13	0.5500000E-01	0.6000000E-01	0.6500000E-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	0.1700000E-01	0.1700000E-01	0.1800000E-01	0.2100000E-01
	0.2300000E-01	0.2500000E-01		
PROPERTY TABLE KXX	MAT=	10	NUM. POINTS=	12
SLOC= 7	0.2700000E-01	0.2800000E-01	0.3000000E-01	0.3200000E-01
	0.3400000E-01	0.3600000E-01		
PROPERTY TABLE KXX	MAT=	10	NUM. POINTS=	15
SLOC= 13	0.3700000E-01	0.4100000E-01	0.4400000E-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 **

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

/INPUT FILE= bwrmo1.dat LINE= 0

 ** History of PWR MOX SNF Assembly Heat Generation Rates **
 ** Output Calculated by T. L. Lotz 4/1/95 for ORNL Report Data **
 **
 ** Executable File Name: MATHCAD.EXE **
 ** Output File Name: bwrmo1.dat **
 ** Execution Date: 04/01/95 **
 ** Start Age (years): 10.0 **
 ** Decay Period (years): 10000 **
 ** Enrichment (kg Pu): 5.334 kg Pu/Assembly **
 ** Burnup (MWd/MTM): 37609 **
 ** Assembly Type: BWR **
 ** Pu Fract. (kg Pu/KG HM): 0.0300 **
 **
 ** ASSY(#,1) is the SNF assembly heat in Watts. **
 ** ASSY(#,0) is the time post emplacement in years. **

PARAMETER ASSY(1,1) =	255.6000	255.5000	255.5000	255.4000
	255.4000	255.3000		
PARAMETER ASSY(7,1) =	255.3000	255.2000	255.2000	255.1000
	255.1000	254.8000		
PARAMETER ASSY(13,1) =	254.6000	254.3000	254.1000	253.8000
	253.6000	253.4000		
PARAMETER ASSY(19,1) =	253.1000	252.9000	252.6000	252.4000
	252.1000	251.9000		
PARAMETER ASSY(25,1) =	251.7000	251.4000	251.2000	250.9000
	250.7000	248.3000		
PARAMETER ASSY(31,1) =	246.0000	243.7000	241.4000	239.2000
	237.0000	234.8000		
PARAMETER ASSY(37,1) =	232.7000	230.6000	228.6000	226.6000
	224.6000	222.6000		
PARAMETER ASSY(43,1) =	220.7000	218.8000	216.9000	215.1000
	213.3000	196.7000		
PARAMETER ASSY(49,1) =	182.6000	170.4000	160.0000	150.9000
	143.1000	136.2000		
PARAMETER ASSY(55,1) =	130.3000	125.0000	120.3000	116.2000
	112.5000	108.1000		

PARAMETER ASSY(61,1) =	106.1000 96.34000	103.3000 80.52000	100.8000	98.49000
PARAMETER ASSY(67,1) =	69.87000 46.03000	61.76000 42.63000	55.34000	50.20000
PARAMETER ASSY(73,1) =	39.82000 32.36000	37.46000 30.95000	35.46000	33.75000
PARAMETER ASSY(79,1) =	29.78000 26.04000	28.72000 19.85000	27.76000	26.87000
PARAMETER ASSY(85,1) =	15.68000 7.961000	12.70000 7.178000	10.58000	9.053000
PARAMETER ASSY(91,1) =	6.617000 5.574000	6.216000 5.468000	5.928000	5.721000
PARAMETER ASSY(97,1) =	5.392000 5.251000	5.337000	5.298000	5.271000
PARAMETER ASSY(1,0) =	0.1000000E-05 0.4000000E-01	0.1000000E-01 0.5000000E-01	0.2000000E-01	0.3000000E-01
PARAMETER ASSY(7,0) =	0.6000000E-01 0.1000000	0.7000000E-01 0.1500000	0.8000000E-01	0.9000000E-01
PARAMETER ASSY(13,0) =	0.2000000 0.4000000	0.2500000 0.4500000	0.3000000	0.3500000
PARAMETER ASSY(19,0) =	0.5000000 0.7000000	0.5500000 0.7500000	0.6000000	0.6500000
PARAMETER ASSY(25,0) =	0.8000000 1.000000	0.8500000 1.500000	0.9000000	0.9500000
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 8500.000 9000.000 9500.000
10000.00

PARAMETER ASSY(0,1) = 1.000000

FACTOR ON VECTOR OPERATION RESULT= 0.31558E+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= 15.821

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= 15.821 INPUT= 1.0000

VECTOR LENGTH= 101

PARAMETER FUEL(0,1) = 1.000000

Define new material 14 for SNF effective conductivity

BWR 8x8 pin array with a channel in a Helium Environment

Density: DENS (kg/m³)

Conductivity: KXX (W/m/K)

Specific Heat: C (J/kg/K)

TEMPERATURE TABLE ERASED.

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

SLOC= 1 0.0000000E+00

PROPERTY TABLE DENS MAT= 14 NUM. POINTS= 1

SLOC= 1 3882.420

PROPERTY TABLE C MAT= 14 NUM. POINTS= 1

SLOC= 1 273.1290

Store average effective conductivities

TEMPERATURE TABLE ERASED.

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

SLOC= 1 25.00000 50.00000 75.00000
100.0000 125.0000 150.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 12 ***

SLOC= 7 175.0000 200.0000 225.0000
250.0000 275.0000 300.0000

*** PROPERTY TEMPERATURE TABLE NUM. TEMPS= 16 ***

SLOC= 13 325.0000 350.0000 375.0000
400.0000

PROPERTY TABLE KXX MAT= 14 NUM. POINTS= 6

SLOC= 1 0.2970000 0.3250000 0.3550000 0.3890000
0.4260000 0.4660000

PROPERTY TABLE KXX MAT= 14 NUM. POINTS= 10

SLOC= 7 0.5090000 0.5550000 0.6040000 0.6560000

Construct geometry for Disposal Container

Define center and axis keypoints for waste package
 Also, create placeholder keypoints and lines
 (K's 1,2,3,4,5,6,7,8)
 (L's 1,2,3,4)

KEYPOINT	1	X,Y,Z=	0.000000E+00	0.000000E+00	0.000000E+00	IN CSYS=	0
KEYPOINT	2	X,Y,Z=	0.000000E+00	0.000000E+00	1.00000	IN CSYS=	0
KEYPOINT	3	X,Y,Z=	0.000000E+00	0.000000E+00	1.30000	IN CSYS=	0
KEYPOINT	4	X,Y,Z=	0.000000E+00	0.000000E+00	1.40000	IN CSYS=	0
KEYPOINT	5	X,Y,Z=	0.000000E+00	0.000000E+00	1.50000	IN CSYS=	0
KEYPOINT	6	X,Y,Z=	0.000000E+00	0.000000E+00	1.60000	IN CSYS=	0
KEYPOINT	7	X,Y,Z=	0.000000E+00	0.000000E+00	1.70000	IN CSYS=	0
KEYPOINT	8	X,Y,Z=	0.000000E+00	0.000000E+00	1.80000	IN CSYS=	0

LINE CONNECTS KEYPOINTS	3	4			
LINE NO.= 1	KP1=	3	TAN1=	0.0000	0.0000 -1.0000
	KP2=	4	TAN2=	0.0000	0.0000 1.0000

LINE CONNECTS KEYPOINTS	4	5			
LINE NO.= 2	KP1=	4	TAN1=	0.0000	0.0000 -1.0000
	KP2=	5	TAN2=	0.0000	0.0000 1.0000

LINE CONNECTS KEYPOINTS	5	6			
LINE NO.= 3	KP1=	5	TAN1=	0.0000	0.0000 -1.0000
	KP2=	6	TAN2=	0.0000	0.0000 1.0000

LINE CONNECTS KEYPOINTS	6	7			
LINE NO.= 4	KP1=	6	TAN1=	0.0000	0.0000 -1.0000
	KP2=	7	TAN2=	0.0000	0.0000 1.0000

Define disposal container and MPC outer radius
 (K's 9,10,11,12,13,14,15,16,17,18,19,20)
 (L's 5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20)
 (A's 1,2,3,4,5)

KEYPOINT	9	X,Y,Z=	0.000000E+00	-0.900800	0.000000E+00	IN CSYS=	0
KEYPOINT	10	X,Y,Z=	0.900800	0.000000E+00	0.000000E+00	IN CSYS=	0
KEYPOINT	11	X,Y,Z=	0.000000E+00	0.900800	0.000000E+00	IN CSYS=	0
KEYPOINT	12	X,Y,Z=	0.000000E+00	-0.800800	0.000000E+00	IN CSYS=	0
KEYPOINT	13	X,Y,Z=	0.800800	0.000000E+00	0.000000E+00	IN CSYS=	0
KEYPOINT	14	X,Y,Z=	0.000000E+00	0.800800	0.000000E+00	IN CSYS=	0
KEYPOINT	15	X,Y,Z=	0.000000E+00	-0.780800	0.000000E+00	IN CSYS=	0
KEYPOINT	16	X,Y,Z=	0.780800	0.000000E+00	0.000000E+00	IN CSYS=	0
KEYPOINT	17	X,Y,Z=	0.000000E+00	0.780800	0.000000E+00	IN CSYS=	0
KEYPOINT	18	X,Y,Z=	0.000000E+00	-0.765810	0.000000E+00	IN CSYS=	0
KEYPOINT	19	X,Y,Z=	0.765810	0.000000E+00	0.000000E+00	IN CSYS=	0
KEYPOINT	20	X,Y,Z=	0.000000E+00	0.765810	0.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS	10	13			
LINE NO.= 5	KP1=	10	TAN1=	1.0000	0.0000 0.0000
	KP2=	13	TAN2=	-1.0000	0.0000 0.0000

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LINE CONNECTS KEYPOINTS      13      16
LINE NO.=      6 KP1=      13 TAN1=      1.0000      0.0000      0.0000
                        KP2=      16 TAN2=     -1.0000      0.0000      0.0000

ARC BETWEEN KEYPOINTS      10 AND      9 ORIENTATION KEYPOINT=      1
RADIUS=      0.90080
LINE NO.=      7 KP1=      10 TAN1=      0.0000      1.0000      0.0000
                        KP2=      9 TAN2=     -1.0000      0.0000      0.0000

ARC BETWEEN KEYPOINTS      11 AND      10 ORIENTATION KEYPOINT=      1
RADIUS=      0.90080
LINE NO.=      8 KP1=      11 TAN1=     -1.0000      0.0000      0.0000
                        KP2=      10 TAN2=      0.0000     -1.0000      0.0000

ARC BETWEEN KEYPOINTS      13 AND      12 ORIENTATION KEYPOINT=      1
RADIUS=      0.80080
LINE NO.=      9 KP1=      13 TAN1=      0.0000      1.0000      0.0000
                        KP2=      12 TAN2=     -1.0000      0.0000      0.0000

ARC BETWEEN KEYPOINTS      14 AND      13 ORIENTATION KEYPOINT=      1
RADIUS=      0.80080
LINE NO.=     10 KP1=      14 TAN1=     -1.0000      0.0000      0.0000
                        KP2=      13 TAN2=      0.0000     -1.0000      0.0000

LINE CONNECTS KEYPOINTS      11      14
LINE NO.=     11 KP1=      11 TAN1=      0.0000      1.0000      0.0000
                        KP2=      14 TAN2=      0.0000     -1.0000      0.0000

LINE CONNECTS KEYPOINTS      9      12
LINE NO.=     12 KP1=      9 TAN1=      0.0000     -1.0000      0.0000
                        KP2=      12 TAN2=      0.0000      1.0000      0.0000

ARC BETWEEN KEYPOINTS      15 AND      16 ORIENTATION KEYPOINT=      1
RADIUS=      0.78080
LINE NO.=     13 KP1=      15 TAN1=     -1.0000      0.0000      0.0000
                        KP2=      16 TAN2=      0.0000      1.0000      0.0000

ARC BETWEEN KEYPOINTS      16 AND      17 ORIENTATION KEYPOINT=      1
RADIUS=      0.78080
LINE NO.=     14 KP1=      16 TAN1=      0.0000     -1.0000      0.0000
                        KP2=      17 TAN2=     -1.0000      0.0000      0.0000

LINE CONNECTS KEYPOINTS      14      17
LINE NO.=     15 KP1=      14 TAN1=      0.0000      1.0000      0.0000
                        KP2=      17 TAN2=      0.0000     -1.0000      0.0000

LINE CONNECTS KEYPOINTS      12      15
LINE NO.=     16 KP1=      12 TAN1=      0.0000     -1.0000      0.0000
                        KP2=      15 TAN2=      0.0000      1.0000      0.0000

ARC BETWEEN KEYPOINTS      19 AND      18 ORIENTATION KEYPOINT=      1
RADIUS=      0.76581
LINE NO.=     17 KP1=      19 TAN1=      0.0000      1.0000      0.0000
                        KP2=      18 TAN2=     -1.0000      0.0000      0.0000

ARC BETWEEN KEYPOINTS      20 AND      19 ORIENTATION KEYPOINT=      1
RADIUS=      0.76581
LINE NO.=     18 KP1=      20 TAN1=     -1.0000      0.0000      0.0000
                        KP2=      19 TAN2=      0.0000     -1.0000      0.0000

LINE CONNECTS KEYPOINTS      17      20
LINE NO.=     19 KP1=      17 TAN1=      0.0000      1.0000      0.0000
                        KP2=      20 TAN2=      0.0000     -1.0000      0.0000

LINE CONNECTS KEYPOINTS      15      18
LINE NO.=     20 KP1=      15 TAN1=      0.0000     -1.0000      0.0000
                        KP2=      18 TAN2=      0.0000      1.0000      0.0000

DEFINE AREA BY LIST OF LINES
LINE LIST =      5      7      12      9

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      (TRAVERSED IN SAME DIRECTION AS LINE      5)

AREA NUMBER =      1

DEFINE AREA BY LIST OF LINES
  LINE LIST =      11      8      5      10
  (TRAVERSED IN SAME DIRECTION AS LINE      11)

AREA NUMBER =      2

DEFINE AREA BY LIST OF LINES
  LINE LIST =      6      9      16      13
  (TRAVERSED IN SAME DIRECTION AS LINE      6)

AREA NUMBER =      3

DEFINE AREA BY LIST OF LINES
  LINE LIST =      15      10      6      14
  (TRAVERSED IN SAME DIRECTION AS LINE      15)

AREA NUMBER =      4

DEFINE AREA BY LIST OF LINES
  LINE LIST =      19      14      13      20      17      18
  (TRAVERSED IN SAME DIRECTION AS LINE      19)

AREA NUMBER =      5
*****
  Define MPC shell inner edge and area
  (K's 21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37)
  (  38, 39, 40, 41, 42, 43, 44)
  (L's 21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37)
  (  38,39, 40, 41, 42, 43, 44, 45)
  (A's 6)

KEYPOINT    21    X,Y,Z=  0.000000E+00  0.740410      0.000000E+00  IN CSYS=  0
KEYPOINT    22    X,Y,Z=  0.803148E-01  0.736041      0.000000E+00  IN CSYS=  0
KEYPOINT    23    X,Y,Z=  0.983075E-01  0.733855      0.000000E+00  IN CSYS=  0
KEYPOINT    24    X,Y,Z=  0.107833      0.732516      0.000000E+00  IN CSYS=  0
KEYPOINT    25    X,Y,Z=  0.270545      0.689211      0.000000E+00  IN CSYS=  0
KEYPOINT    26    X,Y,Z=  0.280070      0.685396      0.000000E+00  IN CSYS=  0
KEYPOINT    27    X,Y,Z=  0.473999      0.568799      0.000000E+00  IN CSYS=  0
KEYPOINT    28    X,Y,Z=  0.635060      0.381220      0.000000E+00  IN CSYS=  0
KEYPOINT    29    X,Y,Z=  0.647686      0.358762      0.000000E+00  IN CSYS=  0
KEYPOINT    30    X,Y,Z=  0.716185      0.187846      0.000000E+00  IN CSYS=  0
KEYPOINT    31    X,Y,Z=  0.718616      0.178321      0.000000E+00  IN CSYS=  0
KEYPOINT    32    X,Y,Z=  0.740395      0.476250E-02  0.000000E+00  IN CSYS=  0
KEYPOINT    33    X,Y,Z=  0.740395     -0.476250E-02  0.000000E+00  IN CSYS=  0
KEYPOINT    34    X,Y,Z=  0.718616     -0.178321      0.000000E+00  IN CSYS=  0
KEYPOINT    35    X,Y,Z=  0.716185     -0.187846      0.000000E+00  IN CSYS=  0
KEYPOINT    36    X,Y,Z=  0.647686     -0.358762      0.000000E+00  IN CSYS=  0
KEYPOINT    37    X,Y,Z=  0.635060     -0.381220      0.000000E+00  IN CSYS=  0
KEYPOINT    38    X,Y,Z=  0.473999     -0.568799      0.000000E+00  IN CSYS=  0

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KEYPOINT	39	X,Y,Z=	0.280070	-0.685396	0.000000E+00	IN CSYS=	0
KEYPOINT	40	X,Y,Z=	0.270545	-0.689211	0.000000E+00	IN CSYS=	0
KEYPOINT	41	X,Y,Z=	0.107833	-0.732516	0.000000E+00	IN CSYS=	0
KEYPOINT	42	X,Y,Z=	0.983075E-01	-0.733855	0.000000E+00	IN CSYS=	0
KEYPOINT	43	X,Y,Z=	0.803148E-01	-0.736041	0.000000E+00	IN CSYS=	0
KEYPOINT	44	X,Y,Z=	0.000000E+00	-0.740410	0.000000E+00	IN CSYS=	0

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

ARC BETWEEN KEYPOINTS	22 AND	21	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	22	KP1=	22	TAN1= 0.9941 -0.1085 0.0000
		KP2=	21	TAN2= -1.0000 0.0000 0.0000

ARC BETWEEN KEYPOINTS	23 AND	22	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	23	KP1=	23	TAN1= 0.9911 -0.1328 0.0000
		KP2=	22	TAN2= -0.9941 0.1085 0.0000

ARC BETWEEN KEYPOINTS	24 AND	23	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	24	KP1=	24	TAN1= 0.9893 -0.1456 0.0000
		KP2=	23	TAN2= -0.9911 0.1328 0.0000

ARC BETWEEN KEYPOINTS	25 AND	24	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	25	KP1=	25	TAN1= 0.9309 -0.3654 0.0000
		KP2=	24	TAN2= -0.9893 0.1456 0.0000

ARC BETWEEN KEYPOINTS	26 AND	25	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	26	KP1=	26	TAN1= 0.9257 -0.3783 0.0000
		KP2=	25	TAN2= -0.9309 0.3654 0.0000

ARC BETWEEN KEYPOINTS	27 AND	26	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	27	KP1=	27	TAN1= 0.7682 -0.6402 0.0000
		KP2=	26	TAN2= -0.9257 0.3783 0.0000

ARC BETWEEN KEYPOINTS	28 AND	27	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	28	KP1=	28	TAN1= 0.5156 -0.8568 0.0000
		KP2=	27	TAN2= -0.7690 0.6393 0.0000

ARC BETWEEN KEYPOINTS	29 AND	28	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	29	KP1=	29	TAN1= 0.4748 -0.8801 0.0000
		KP2=	28	TAN2= -0.5051 0.8630 0.0000

ARC BETWEEN KEYPOINTS	30 AND	29	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	30	KP1=	30	TAN1= 0.2537 -0.9673 0.0000
		KP2=	29	TAN2= -0.4845 0.8748 0.0000

ARC BETWEEN KEYPOINTS	31 AND	30	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	31	KP1=	31	TAN1= 0.2408 -0.9706 0.0000
		KP2=	30	TAN2= -0.2537 0.9673 0.0000

ARC BETWEEN KEYPOINTS	32 AND	31	ORIENTATION KEYPOINT=	1
RADIUS= 0.74041				
LINE NO.=	32	KP1=	32	TAN1= 0.0064 -1.0000 0.0000


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      KP2=      31 TAN2=  -0.2408  0.9706  0.0000
ARC BETWEEN KEYPOINTS      33 AND      32 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      33 KP1=      33 TAN1=  -0.0064 -1.0000  0.0000
                  KP2=      32 TAN2=  -0.0064  1.0000  0.0000

ARC BETWEEN KEYPOINTS      34 AND      33 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      34 KP1=      34 TAN1=  -0.2408 -0.9706  0.0000
                  KP2=      33 TAN2=   0.0064  1.0000  0.0000

ARC BETWEEN KEYPOINTS      35 AND      34 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      35 KP1=      35 TAN1=  -0.2537 -0.9673  0.0000
                  KP2=      34 TAN2=   0.2408  0.9706  0.0000

ARC BETWEEN KEYPOINTS      36 AND      35 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      36 KP1=      36 TAN1=  -0.4845 -0.8748  0.0000
                  KP2=      35 TAN2=   0.2537  0.9673  0.0000

ARC BETWEEN KEYPOINTS      37 AND      36 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      37 KP1=      37 TAN1=  -0.5051 -0.8630  0.0000
                  KP2=      36 TAN2=   0.4748  0.8801  0.0000

ARC BETWEEN KEYPOINTS      38 AND      37 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      38 KP1=      38 TAN1=  -0.7690 -0.6393  0.0000
                  KP2=      37 TAN2=   0.5156  0.8568  0.0000

ARC BETWEEN KEYPOINTS      39 AND      38 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      39 KP1=      39 TAN1=  -0.9257 -0.3783  0.0000
                  KP2=      38 TAN2=   0.7682  0.6402  0.0000

ARC BETWEEN KEYPOINTS      40 AND      39 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      40 KP1=      40 TAN1=  -0.9309 -0.3654  0.0000
                  KP2=      39 TAN2=   0.9257  0.3783  0.0000

ARC BETWEEN KEYPOINTS      41 AND      40 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      41 KP1=      41 TAN1=  -0.9893 -0.1456  0.0000
                  KP2=      40 TAN2=   0.9309  0.3654  0.0000

ARC BETWEEN KEYPOINTS      42 AND      41 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      42 KP1=      42 TAN1=  -0.9911 -0.1328  0.0000
                  KP2=      41 TAN2=   0.9893  0.1456  0.0000

ARC BETWEEN KEYPOINTS      43 AND      42 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      43 KP1=      43 TAN1=  -0.9941 -0.1085  0.0000
                  KP2=      42 TAN2=   0.9911  0.1328  0.0000

ARC BETWEEN KEYPOINTS      44 AND      43 ORIENTATION KEYPOINT=      1
RADIUS=  0.74041
LINE NO.=      44 KP1=      44 TAN1=  -1.0000  0.0000  0.0000
                  KP2=      43 TAN2=   0.9941  0.1085  0.0000

LINE CONNECTS KEYPOINTS      18      44
LINE NO.=      45 KP1=      18 TAN1=   0.0000 -1.0000  0.0000
                  KP2=      44 TAN2=   0.0000  1.0000  0.0000

SELECT      FOR ITEM=LINE COMPONENT=
IN RANGE      21 TO      45 STEP      1

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25 LINES (OF 45 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 17 TO 18 STEP 1

27 LINES (OF 45 DEFINED) SELECTED BY LSEL COMMAND.

DEFINE AREA BY LIST OF LINES
LINE LIST = ALL SELECTED LINES
(TRAVERSED IN SAME DIRECTION AS LINE 17)

AREA NUMBER = 6

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

45 LINES (OF 45 DEFINED) SELECTED BY LSEL COMMAND.

Define tube guides

(K's 45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61)

(62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78)

(79,80,81,82)

(L's 46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62)

(63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79)

(80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96)

(97,98,99,100,101,102,103,104,105,106,107,108,109,110)

(111,112,113,114,115)

(A's 7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24)

(25,26,27,28,29,30,31,32,33,34,35,36,37,38)

Set 1: top plate

KEYPOINT 45 X,Y,Z= 0.803148E-01 0.726516 0.000000E+00 IN CSYS= 0

KEYPOINT 46 X,Y,Z= 0.000000E+00 0.736041 0.000000E+00 IN CSYS= 0

KEYPOINT 47 X,Y,Z= 0.000000E+00 0.726516 0.000000E+00 IN CSYS= 0

Set 2: top side guide

KEYPOINT 48 X,Y,Z= 0.983075E-01 0.556588 0.000000E+00 IN CSYS= 0

KEYPOINT 49 X,Y,Z= 0.107833 0.566113 0.000000E+00 IN CSYS= 0

KEYPOINT 50 X,Y,Z= 0.270545 0.566113 0.000000E+00 IN CSYS= 0

KEYPOINT 51 X,Y,Z= 0.280070 0.566113 0.000000E+00 IN CSYS= 0

KEYPOINT 52 X,Y,Z= 0.464474 0.566113 0.000000E+00 IN CSYS= 0

KEYPOINT 53 X,Y,Z= 0.464474 0.556588 0.000000E+00 IN CSYS= 0

KEYPOINT 54 X,Y,Z= 0.473999 0.566113 0.000000E+00 IN CSYS= 0

KEYPOINT 55 X,Y,Z= 0.473999 0.556588 0.000000E+00 IN CSYS= 0

Set 3: top corner

KEYPOINT 56 X,Y,Z= 0.464474 0.568799 0.000000E+00 IN CSYS= 0

KEYPOINT 57 X,Y,Z= 0.464474 0.371695 0.000000E+00 IN CSYS= 0

KEYPOINT 58 X,Y,Z= 0.473999 0.381220 0.000000E+00 IN CSYS= 0

KEYPOINT 59 X,Y,Z= 0.635060 0.371695 0.000000E+00 IN CSYS= 0

Set 4: side guide

KEYPOINT 60 X,Y,Z= 0.638161 0.358762 0.000000E+00 IN CSYS= 0

KEYPOINT 61 X,Y,Z= 0.638161 -0.358762 0.000000E+00 IN CSYS= 0

KEYPOINT	62	X,Y,Z=	0.647686	0.187846	0.000000E+00	IN CSYS=	0
KEYPOINT	63	X,Y,Z=	0.647686	0.178321	0.000000E+00	IN CSYS=	0
KEYPOINT	64	X,Y,Z=	0.647686	0.476250E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	65	X,Y,Z=	0.647686	-0.476250E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	66	X,Y,Z=	0.647686	-0.178321	0.000000E+00	IN CSYS=	0
KEYPOINT	67	X,Y,Z=	0.647686	-0.187846	0.000000E+00	IN CSYS=	0

Set 3: bottom corner

KEYPOINT	68	X,Y,Z=	0.464474	-0.568799	0.000000E+00	IN CSYS=	0
KEYPOINT	69	X,Y,Z=	0.464474	-0.371695	0.000000E+00	IN CSYS=	0
KEYPOINT	70	X,Y,Z=	0.473999	-0.381220	0.000000E+00	IN CSYS=	0
KEYPOINT	71	X,Y,Z=	0.635060	-0.371695	0.000000E+00	IN CSYS=	0

Set 2: bottom side guide

KEYPOINT	72	X,Y,Z=	0.983075E-01	-0.556588	0.000000E+00	IN CSYS=	0
KEYPOINT	73	X,Y,Z=	0.107833	-0.566113	0.000000E+00	IN CSYS=	0
KEYPOINT	74	X,Y,Z=	0.270545	-0.566113	0.000000E+00	IN CSYS=	0
KEYPOINT	75	X,Y,Z=	0.280070	-0.566113	0.000000E+00	IN CSYS=	0
KEYPOINT	76	X,Y,Z=	0.464474	-0.566113	0.000000E+00	IN CSYS=	0
KEYPOINT	77	X,Y,Z=	0.464474	-0.556588	0.000000E+00	IN CSYS=	0
KEYPOINT	78	X,Y,Z=	0.473999	-0.566113	0.000000E+00	IN CSYS=	0
KEYPOINT	79	X,Y,Z=	0.473999	-0.556588	0.000000E+00	IN CSYS=	0

Set 1: bottom plate

KEYPOINT	80	X,Y,Z=	0.803148E-01	-0.726516	0.000000E+00	IN CSYS=	0
KEYPOINT	81	X,Y,Z=	0.000000E+00	-0.736041	0.000000E+00	IN CSYS=	0
KEYPOINT	82	X,Y,Z=	0.000000E+00	-0.726516	0.000000E+00	IN CSYS=	0

Now Fill in the required lines:

Set 1: bottom plate

LINE CONNECTS KEYPOINTS		21	46			
LINE NO.=	46	KP1=	21	TAN1=	0.0000	1.0000 0.0000
		KP2=	46	TAN2=	0.0000	-1.0000 0.0000
LINE CONNECTS KEYPOINTS		46	47			
LINE NO.=	47	KP1=	46	TAN1=	0.0000	1.0000 0.0000
		KP2=	47	TAN2=	0.0000	-1.0000 0.0000
LINE CONNECTS KEYPOINTS		46	22			
LINE NO.=	48	KP1=	46	TAN1=	-1.0000	0.0000 0.0000
		KP2=	22	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		22	45			
LINE NO.=	49	KP1=	22	TAN1=	0.0000	1.0000 0.0000
		KP2=	45	TAN2=	0.0000	-1.0000 0.0000
LINE CONNECTS KEYPOINTS		45	47			
LINE NO.=	50	KP1=	45	TAN1=	1.0000	0.0000 0.0000

KP2= 47 TAN2= -1.0000 0.0000 0.0000

Set 2: top side guide

LINE CONNECTS KEYPOINTS 48 23
 LINE NO.= 51 KP1= 48 TAN1= 0.0000 -1.0000 0.0000
 KP2= 23 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 48 49
 LINE NO.= 52 KP1= 48 TAN1= -0.7071 -0.7071 0.0000
 KP2= 49 TAN2= 0.7071 0.7071 0.0000

LINE CONNECTS KEYPOINTS 24 49
 LINE NO.= 53 KP1= 24 TAN1= 0.0000 1.0000 0.0000
 KP2= 49 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 49 50
 LINE NO.= 54 KP1= 49 TAN1= -1.0000 0.0000 0.0000
 KP2= 50 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 53 48
 LINE NO.= 55 KP1= 53 TAN1= 1.0000 0.0000 0.0000
 KP2= 48 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 50 25
 LINE NO.= 56 KP1= 50 TAN1= 0.0000 -1.0000 0.0000
 KP2= 25 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 26 51
 LINE NO.= 57 KP1= 26 TAN1= 0.0000 1.0000 0.0000
 KP2= 51 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 50 51
 LINE NO.= 58 KP1= 50 TAN1= -1.0000 0.0000 0.0000
 KP2= 51 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 51 52
 LINE NO.= 59 KP1= 51 TAN1= -1.0000 0.0000 0.0000
 KP2= 52 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 52 53
 LINE NO.= 60 KP1= 52 TAN1= 0.0000 1.0000 0.0000
 KP2= 53 TAN2= 0.0000 -1.0000 0.0000

Set 3: top corner

LINE CONNECTS KEYPOINTS 56 27
 LINE NO.= 61 KP1= 56 TAN1= -1.0000 0.0000 0.0000
 KP2= 27 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 52 56
 LINE NO.= 62 KP1= 52 TAN1= 0.0000 -1.0000 0.0000
 KP2= 56 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 27 54
 LINE NO.= 63 KP1= 27 TAN1= 0.0000 1.0000 0.0000
 KP2= 54 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 54 55
 LINE NO.= 64 KP1= 54 TAN1= 0.0000 1.0000 0.0000
 KP2= 55 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 52 54
 LINE NO.= 65 KP1= 52 TAN1= -1.0000 0.0000 0.0000
 KP2= 54 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 53 55
 LINE NO.= 66 KP1= 53 TAN1= -1.0000 0.0000 0.0000
 KP2= 55 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS	KEYPOINTS	55	58			
LINE NO.=	67	KP1=	55	TAN1=	0.0000	1.0000 0.0000
		KP2=	58	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS	KEYPOINTS	57	53			
LINE NO.=	68	KP1=	57	TAN1=	0.0000	-1.0000 0.0000
		KP2=	53	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS	KEYPOINTS	57	58			
LINE NO.=	69	KP1=	57	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	58	TAN2=	0.7071	0.7071 0.0000

LINE CONNECTS	KEYPOINTS	58	28			
LINE NO.=	70	KP1=	58	TAN1=	-1.0000	0.0000 0.0000
		KP2=	28	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	59	57			
LINE NO.=	71	KP1=	59	TAN1=	1.0000	0.0000 0.0000
		KP2=	57	TAN2=	-1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	28	59			
LINE NO.=	72	KP1=	28	TAN1=	0.0000	1.0000 0.0000
		KP2=	59	TAN2=	0.0000	-1.0000 0.0000

Set 4: side guide

LINE CONNECTS	KEYPOINTS	60	29			
LINE NO.=	73	KP1=	60	TAN1=	-1.0000	0.0000 0.0000
		KP2=	29	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	61	60			
LINE NO.=	74	KP1=	61	TAN1=	0.0000	-1.0000 0.0000
		KP2=	60	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS	KEYPOINTS	29	62			
LINE NO.=	75	KP1=	29	TAN1=	0.0000	1.0000 0.0000
		KP2=	62	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS	KEYPOINTS	62	63			
LINE NO.=	76	KP1=	62	TAN1=	0.0000	1.0000 0.0000
		KP2=	63	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS	KEYPOINTS	62	30			
LINE NO.=	77	KP1=	62	TAN1=	-1.0000	0.0000 0.0000
		KP2=	30	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	31	63			
LINE NO.=	78	KP1=	31	TAN1=	1.0000	0.0000 0.0000
		KP2=	63	TAN2=	-1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	63	64			
LINE NO.=	79	KP1=	63	TAN1=	0.0000	1.0000 0.0000
		KP2=	64	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS	KEYPOINTS	64	65			
LINE NO.=	80	KP1=	64	TAN1=	0.0000	1.0000 0.0000
		KP2=	65	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS	KEYPOINTS	64	32			
LINE NO.=	81	KP1=	64	TAN1=	-1.0000	0.0000 0.0000
		KP2=	32	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	33	65			
LINE NO.=	82	KP1=	33	TAN1=	1.0000	0.0000 0.0000
		KP2=	65	TAN2=	-1.0000	0.0000 0.0000

LINE CONNECTS	KEYPOINTS	65	66			
LINE NO.=	83	KP1=	65	TAN1=	0.0000	1.0000 0.0000
		KP2=	66	TAN2=	0.0000	-1.0000 0.0000

LINE CONNECTS KEYPOINTS 66 67
 LINE NO.= 84 KP1= 66 TAN1= 0.0000 1.0000 0.0000
 KP2= 67 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 66 34
 LINE NO.= 85 KP1= 66 TAN1= -1.0000 0.0000 0.0000
 KP2= 34 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 35 67
 LINE NO.= 86 KP1= 35 TAN1= 1.0000 0.0000 0.0000
 KP2= 67 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 67 36
 LINE NO.= 87 KP1= 67 TAN1= 0.0000 1.0000 0.0000
 KP2= 36 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 36 61
 LINE NO.= 88 KP1= 36 TAN1= 1.0000 0.0000 0.0000
 KP2= 61 TAN2= -1.0000 0.0000 0.0000

Set 3: bottom corner

LINE CONNECTS KEYPOINTS 37 71
 LINE NO.= 89 KP1= 37 TAN1= 0.0000 -1.0000 0.0000
 KP2= 71 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 69 71
 LINE NO.= 90 KP1= 69 TAN1= -1.0000 0.0000 0.0000
 KP2= 71 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 69 70
 LINE NO.= 91 KP1= 69 TAN1= -0.7071 0.7071 0.0000
 KP2= 70 TAN2= 0.7071 -0.7071 0.0000

LINE CONNECTS KEYPOINTS 37 70
 LINE NO.= 92 KP1= 37 TAN1= 1.0000 0.0000 0.0000
 KP2= 70 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 70 79
 LINE NO.= 93 KP1= 70 TAN1= 0.0000 1.0000 0.0000
 KP2= 79 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 79 78
 LINE NO.= 94 KP1= 79 TAN1= 0.0000 1.0000 0.0000
 KP2= 78 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 78 38
 LINE NO.= 95 KP1= 78 TAN1= 0.0000 1.0000 0.0000
 KP2= 38 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 38 68
 LINE NO.= 96 KP1= 38 TAN1= 1.0000 0.0000 0.0000
 KP2= 68 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 68 76
 LINE NO.= 97 KP1= 68 TAN1= 0.0000 -1.0000 0.0000
 KP2= 76 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 76 77
 LINE NO.= 98 KP1= 76 TAN1= 0.0000 -1.0000 0.0000
 KP2= 77 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 77 69
 LINE NO.= 99 KP1= 77 TAN1= 0.0000 -1.0000 0.0000
 KP2= 69 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 76 78
 LINE NO.= 100 KP1= 76 TAN1= -1.0000 0.0000 0.0000
 KP2= 78 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 77 79
 LINE NO.= 101 KP1= 77 TAN1= -1.0000 0.0000 0.0000
 KP2= 79 TAN2= 1.0000 0.0000 0.0000

Set 2: bottom side guide

LINE CONNECTS KEYPOINTS 72 77
 LINE NO.= 102 KP1= 72 TAN1= -1.0000 0.0000 0.0000
 KP2= 77 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 72 73
 LINE NO.= 103 KP1= 72 TAN1= -0.7071 0.7071 0.0000
 KP2= 73 TAN2= 0.7071 -0.7071 0.0000

LINE CONNECTS KEYPOINTS 76 75
 LINE NO.= 104 KP1= 76 TAN1= 1.0000 0.0000 0.0000
 KP2= 75 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 75 74
 LINE NO.= 105 KP1= 75 TAN1= 1.0000 0.0000 0.0000
 KP2= 74 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 74 73
 LINE NO.= 106 KP1= 74 TAN1= 1.0000 0.0000 0.0000
 KP2= 73 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 73 41
 LINE NO.= 107 KP1= 73 TAN1= 0.0000 1.0000 0.0000
 KP2= 41 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 42 72
 LINE NO.= 108 KP1= 42 TAN1= 0.0000 -1.0000 0.0000
 KP2= 72 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 40 74
 LINE NO.= 109 KP1= 40 TAN1= 0.0000 -1.0000 0.0000
 KP2= 74 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 75 39
 LINE NO.= 110 KP1= 75 TAN1= 0.0000 1.0000 0.0000
 KP2= 39 TAN2= 0.0000 -1.0000 0.0000

Set 1: bottom plate

LINE CONNECTS KEYPOINTS 80 43
 LINE NO.= 111 KP1= 80 TAN1= 0.0000 1.0000 0.0000
 KP2= 43 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 82 80
 LINE NO.= 112 KP1= 82 TAN1= -1.0000 0.0000 0.0000
 KP2= 80 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 82 81
 LINE NO.= 113 KP1= 82 TAN1= 0.0000 1.0000 0.0000
 KP2= 81 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 43 81
 LINE NO.= 114 KP1= 43 TAN1= 1.0000 0.0000 0.0000
 KP2= 81 TAN2= -1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 81 44
 LINE NO.= 115 KP1= 81 TAN1= 0.0000 1.0000 0.0000
 KP2= 44 TAN2= 0.0000 -1.0000 0.0000

Radiation/Back Fill Gas Gaps:

Set 1: TOP

DEFINE AREA BY LIST OF LINES

LINE LIST = 46 48 22

(TRAVERSED IN SAME DIRECTION AS LINE 46)

AREA NUMBER = 7
Set 2: TOP

DEFINE AREA BY LIST OF LINES
LINE LIST = 25 53 54 56
(TRAVERSED IN SAME DIRECTION AS LINE 25)

AREA NUMBER = 8

DEFINE AREA BY LIST OF LINES
LINE LIST = 27 57 59 62 61
(TRAVERSED IN SAME DIRECTION AS LINE 27)

AREA NUMBER = 9
Set 3: TOP

DEFINE AREA BY LIST OF LINES
LINE LIST = 28 63 64 67 70
(TRAVERSED IN SAME DIRECTION AS LINE 28)

AREA NUMBER = 10
Set 4: SIDE

DEFINE AREA BY LIST OF LINES
LINE LIST = 30 75 77
(TRAVERSED IN SAME DIRECTION AS LINE 30)

AREA NUMBER = 11

DEFINE AREA BY LIST OF LINES
LINE LIST = 32 78 79 81
(TRAVERSED IN SAME DIRECTION AS LINE 32)

AREA NUMBER = 12

DEFINE AREA BY LIST OF LINES
LINE LIST = 34 82 83 85
(TRAVERSED IN SAME DIRECTION AS LINE 34)

AREA NUMBER = 13

DEFINE AREA BY LIST OF LINES
LINE LIST = 36 86 87
(TRAVERSED IN SAME DIRECTION AS LINE 36)

AREA NUMBER = 14
Set 3: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 38 92 93 94 95
(TRAVERSED IN SAME DIRECTION AS LINE 38)

AREA NUMBER = 15
Set 2: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 39 96 97 104 110
(TRAVERSED IN SAME DIRECTION AS LINE 39)

AREA NUMBER = 16

DEFINE AREA BY LIST OF LINES
LINE LIST = 41 109 106 107
(TRAVERSED IN SAME DIRECTION AS LINE 41)

AREA NUMBER = 17
Set 1: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 44 114 115

(TRAVERSED IN SAME DIRECTION AS LINE 44)

AREA NUMBER = 18

SOLID GUIDES:

Set 1: TOP

DEFINE AREA BY LIST OF LINES

LINE LIST = 47 48 49 50

(TRAVERSED IN SAME DIRECTION AS LINE 47)

AREA NUMBER = 19

Set 2: TOP

DEFINE AREA BY LIST OF LINES

LINE LIST = 24 51 52 53

(TRAVERSED IN SAME DIRECTION AS LINE 24)

AREA NUMBER = 20

DEFINE AREA BY LIST OF LINES

LINE LIST = 52 55 60 59 58 54

(TRAVERSED IN SAME DIRECTION AS LINE 52)

AREA NUMBER = 21

DEFINE AREA BY LIST OF LINES

LINE LIST = 26 56 58 57

(TRAVERSED IN SAME DIRECTION AS LINE 26)

AREA NUMBER = 22

Set 3: TOP

DEFINE AREA BY LIST OF LINES

LINE LIST = 61 62 65 63

(TRAVERSED IN SAME DIRECTION AS LINE 61)

AREA NUMBER = 23

DEFINE AREA BY LIST OF LINES

LINE LIST = 65 60 66 64

(TRAVERSED IN SAME DIRECTION AS LINE 65)

AREA NUMBER = 24

DEFINE AREA BY LIST OF LINES

LINE LIST = 66 68 69 67

(TRAVERSED IN SAME DIRECTION AS LINE 66)

AREA NUMBER = 25

DEFINE AREA BY LIST OF LINES

LINE LIST = 70 69 71 72

(TRAVERSED IN SAME DIRECTION AS LINE 70)

AREA NUMBER = 26

Set 4: SIDE

DEFINE AREA BY LIST OF LINES

LINE LIST = 73 74 88 87 84 83 80 79 76 75

(TRAVERSED IN SAME DIRECTION AS LINE 73)

AREA NUMBER = 27

DEFINE AREA BY LIST OF LINES

LINE LIST = 31 77 76 78

(TRAVERSED IN SAME DIRECTION AS LINE 31)

AREA NUMBER = 28

DEFINE AREA BY LIST OF LINES

```

LINE LIST = 33 81 80 82
(TRAVERSED IN SAME DIRECTION AS LINE 33)

AREA NUMBER = 29

DEFINE AREA BY LIST OF LINES
LINE LIST = 35 85 84 86
(TRAVERSED IN SAME DIRECTION AS LINE 35)

AREA NUMBER = 30
Set 3: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 89 90 91 92
(TRAVERSED IN SAME DIRECTION AS LINE 89)

AREA NUMBER = 31

DEFINE AREA BY LIST OF LINES
LINE LIST = 91 93 101 99
(TRAVERSED IN SAME DIRECTION AS LINE 91)

AREA NUMBER = 32

DEFINE AREA BY LIST OF LINES
LINE LIST = 101 94 100 98
(TRAVERSED IN SAME DIRECTION AS LINE 101)

AREA NUMBER = 33

DEFINE AREA BY LIST OF LINES
LINE LIST = 100 95 96 97
(TRAVERSED IN SAME DIRECTION AS LINE 100)

AREA NUMBER = 34
Set 2: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 102 98 104 105 106 103
(TRAVERSED IN SAME DIRECTION AS LINE 102)

AREA NUMBER = 35

DEFINE AREA BY LIST OF LINES
LINE LIST = 40 110 105 109
(TRAVERSED IN SAME DIRECTION AS LINE 40)

AREA NUMBER = 36

DEFINE AREA BY LIST OF LINES
LINE LIST = 42 107 103 108
(TRAVERSED IN SAME DIRECTION AS LINE 42)

AREA NUMBER = 37
Set 1: BOTTOM

DEFINE AREA BY LIST OF LINES
LINE LIST = 111 112 113 114
(TRAVERSED IN SAME DIRECTION AS LINE 111)

AREA NUMBER = 38
*****
Define center edge half-tube
(K's 83,84,85,86,87,88,89,90,91,92,93,94)
(L's 116,117,118,119,120,121,122,123,124,125,126,127,128)
(C 129,130,131,132,133)
(A's 39,40,41,42,43,44,45)

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KEYPOINT 83 X,Y,Z= 0.000000E+00 0.238760E-02 0.000000E+00 IN CSYS= 0

KEYPOINT	84	X,Y,Z=	0.000000E+00	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	85	X,Y,Z=	0.000000E+00	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	86	X,Y,Z=	0.000000E+00	0.167488	0.000000E+00	IN CSYS=	0
KEYPOINT	87	X,Y,Z=	0.000000E+00	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	88	X,Y,Z=	0.000000E+00	0.180188	0.000000E+00	IN CSYS=	0
KEYPOINT	89	X,Y,Z=	0.889000E-01	0.238760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	90	X,Y,Z=	0.825500E-01	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	91	X,Y,Z=	0.762000E-01	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	92	X,Y,Z=	0.889000E-01	0.180188	0.000000E+00	IN CSYS=	0
KEYPOINT	93	X,Y,Z=	0.825500E-01	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	94	X,Y,Z=	0.762000E-01	0.167488	0.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS	83	84			
LINE NO.= 116	KP1=	83	TAN1=	0.0000	-1.0000 0.0000
	KP2=	84	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS KEYPOINTS	84	85			
LINE NO.= 117	KP1=	84	TAN1=	0.0000	-1.0000 0.0000
	KP2=	85	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS KEYPOINTS	86	87			
LINE NO.= 118	KP1=	86	TAN1=	0.0000	-1.0000 0.0000
	KP2=	87	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS KEYPOINTS	87	88			
LINE NO.= 119	KP1=	87	TAN1=	0.0000	-1.0000 0.0000
	KP2=	88	TAN2=	0.0000	1.0000 0.0000

LINE CONNECTS KEYPOINTS	89	83			
LINE NO.= 120	KP1=	89	TAN1=	1.0000	0.0000 0.0000
	KP2=	83	TAN2=	-1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	84	90			
LINE NO.= 121	KP1=	84	TAN1=	-1.0000	0.0000 0.0000
	KP2=	90	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	85	91			
LINE NO.= 122	KP1=	85	TAN1=	-1.0000	0.0000 0.0000
	KP2=	91	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	86	94			
LINE NO.= 123	KP1=	86	TAN1=	-1.0000	0.0000 0.0000
	KP2=	94	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	87	93			
LINE NO.= 124	KP1=	87	TAN1=	-1.0000	0.0000 0.0000
	KP2=	93	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	88	92			
LINE NO.= 125	KP1=	88	TAN1=	-1.0000	0.0000 0.0000
	KP2=	92	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS	90	89			
LINE NO.= 126	KP1=	90	TAN1=	-0.7071	0.7071 0.0000
	KP2=	89	TAN2=	0.7071	-0.7071 0.0000

LINE CONNECTS KEYPOINTS	91	90			
LINE NO.= 127	KP1=	91	TAN1=	-0.7071	0.7071 0.0000
	KP2=	90	TAN2=	0.7071	-0.7071 0.0000

LINE CONNECTS KEYPOINTS 94 93
 LINE NO.= 128 KP1= 94 TAN1= -0.7071 -0.7071 0.0000
 KP2= 93 TAN2= 0.7071 0.7071 0.0000

LINE CONNECTS KEYPOINTS 93 92
 LINE NO.= 129 KP1= 93 TAN1= -0.7071 -0.7071 0.0000
 KP2= 92 TAN2= 0.7071 0.7071 0.0000

LINE CONNECTS KEYPOINTS 85 86
 LINE NO.= 130 KP1= 85 TAN1= 0.0000 -1.0000 0.0000
 KP2= 86 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 91 94
 LINE NO.= 131 KP1= 91 TAN1= 0.0000 -1.0000 0.0000
 KP2= 94 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 90 93
 LINE NO.= 132 KP1= 90 TAN1= 0.0000 -1.0000 0.0000
 KP2= 93 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 89 92
 LINE NO.= 133 KP1= 89 TAN1= 0.0000 -1.0000 0.0000
 KP2= 92 TAN2= 0.0000 1.0000 0.0000

DEFINE AREA BY LIST OF LINES
 LINE LIST = 130 123 131 122
 (TRAVERSED IN SAME DIRECTION AS LINE 130)

AREA NUMBER = 39

DEFINE AREA BY LIST OF LINES
 LINE LIST = 116 121 126 120
 (TRAVERSED IN SAME DIRECTION AS LINE 116)

AREA NUMBER = 40

DEFINE AREA BY LIST OF LINES
 LINE LIST = 117 122 127 121
 (TRAVERSED IN SAME DIRECTION AS LINE 117)

AREA NUMBER = 41

DEFINE AREA BY LIST OF LINES
 LINE LIST = 118 124 128 123
 (TRAVERSED IN SAME DIRECTION AS LINE 118)

AREA NUMBER = 42

DEFINE AREA BY LIST OF LINES
 LINE LIST = 119 125 129 124
 (TRAVERSED IN SAME DIRECTION AS LINE 119)

AREA NUMBER = 43

DEFINE AREA BY LIST OF LINES
 LINE LIST = 131 128 132 127
 (TRAVERSED IN SAME DIRECTION AS LINE 131)

AREA NUMBER = 44

DEFINE AREA BY LIST OF LINES
 LINE LIST = 132 129 133 126
 (TRAVERSED IN SAME DIRECTION AS LINE 132)

AREA NUMBER = 45

 Define center full-tube
 (K's 95,96,97,98,99,100,101,102,103,104,105,106)
 (L's 134,135,136,137,138,139,140,141,142,143,144,145)
 (146,147,148,149,150,151,152,153)

(A's 46,47,48,49,50,51,52,53,54)

KEYPOINT	95	X,Y,Z=	0.936752E-01	0.238760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	96	X,Y,Z=	0.271475	0.238760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	97	X,Y,Z=	0.100025	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	98	X,Y,Z=	0.265125	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	99	X,Y,Z=	0.106375	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	100	X,Y,Z=	0.258775	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	101	X,Y,Z=	0.106375	0.167488	0.000000E+00	IN CSYS=	0
KEYPOINT	102	X,Y,Z=	0.258775	0.167488	0.000000E+00	IN CSYS=	0
KEYPOINT	103	X,Y,Z=	0.100025	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	104	X,Y,Z=	0.265125	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	105	X,Y,Z=	0.936752E-01	0.180188	0.000000E+00	IN CSYS=	0
KEYPOINT	106	X,Y,Z=	0.271475	0.180188	0.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS		95	97			
LINE NO.=	134	KP1=	95	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	97	TAN2=	0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		97	99			
LINE NO.=	135	KP1=	97	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	99	TAN2=	0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		101	103			
LINE NO.=	136	KP1=	101	TAN1=	0.7071	-0.7071 0.0000
		KP2=	103	TAN2=	-0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		103	105			
LINE NO.=	137	KP1=	103	TAN1=	0.7071	-0.7071 0.0000
		KP2=	105	TAN2=	-0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		96	98			
LINE NO.=	138	KP1=	96	TAN1=	0.7071	-0.7071 0.0000
		KP2=	98	TAN2=	-0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		98	100			
LINE NO.=	139	KP1=	98	TAN1=	0.7071	-0.7071 0.0000
		KP2=	100	TAN2=	-0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		102	104			
LINE NO.=	140	KP1=	102	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	104	TAN2=	0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		104	106			
LINE NO.=	141	KP1=	104	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	106	TAN2=	0.7071	0.7071 0.0000

LINE CONNECTS KEYPOINTS		96	95			
LINE NO.=	142	KP1=	96	TAN1=	1.0000	0.0000 0.0000
		KP2=	95	TAN2=	-1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS		97	98			
LINE NO.=	143	KP1=	97	TAN1=	-1.0000	0.0000 0.0000
		KP2=	98	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS		99	100			
LINE NO.=	144	KP1=	99	TAN1=	-1.0000	0.0000 0.0000
		KP2=	100	TAN2=	1.0000	0.0000 0.0000

LINE CONNECTS KEYPOINTS 101 102
 LINE NO.= 145 KP1= 101 TAN1= -1.0000 0.0000 0.0000
 KP2= 102 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 103 104
 LINE NO.= 146 KP1= 103 TAN1= -1.0000 0.0000 0.0000
 KP2= 104 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 105 106
 LINE NO.= 147 KP1= 105 TAN1= -1.0000 0.0000 0.0000
 KP2= 106 TAN2= 1.0000 0.0000 0.0000

LINE CONNECTS KEYPOINTS 95 105
 LINE NO.= 148 KP1= 95 TAN1= 0.0000 -1.0000 0.0000
 KP2= 105 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 97 103
 LINE NO.= 149 KP1= 97 TAN1= 0.0000 -1.0000 0.0000
 KP2= 103 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 99 101
 LINE NO.= 150 KP1= 99 TAN1= 0.0000 -1.0000 0.0000
 KP2= 101 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 100 102
 LINE NO.= 151 KP1= 100 TAN1= 0.0000 -1.0000 0.0000
 KP2= 102 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 98 104
 LINE NO.= 152 KP1= 98 TAN1= 0.0000 -1.0000 0.0000
 KP2= 104 TAN2= 0.0000 1.0000 0.0000

LINE CONNECTS KEYPOINTS 106 96
 LINE NO.= 153 KP1= 106 TAN1= 0.0000 1.0000 0.0000
 KP2= 96 TAN2= 0.0000 -1.0000 0.0000

DEFINE AREA BY LIST OF LINES
 LINE LIST = 144 151 145 150
 (TRAVERSED IN SAME DIRECTION AS LINE 144)

AREA NUMBER = 46

DEFINE AREA BY LIST OF LINES
 LINE LIST = 142 138 143 134
 (TRAVERSED IN SAME DIRECTION AS LINE 142)

AREA NUMBER = 47

DEFINE AREA BY LIST OF LINES
 LINE LIST = 143 139 144 135
 (TRAVERSED IN SAME DIRECTION AS LINE 143)

AREA NUMBER = 48

DEFINE AREA BY LIST OF LINES
 LINE LIST = 145 140 146 136
 (TRAVERSED IN SAME DIRECTION AS LINE 145)

AREA NUMBER = 49

DEFINE AREA BY LIST OF LINES
 LINE LIST = 146 141 147 137
 (TRAVERSED IN SAME DIRECTION AS LINE 146)

AREA NUMBER = 50

DEFINE AREA BY LIST OF LINES
 LINE LIST = 148 134 149 137
 (TRAVERSED IN SAME DIRECTION AS LINE 148)

AREA NUMBER = 51

DEFINE AREA BY LIST OF LINES

LINE LIST = 149 135 150 136
(TRAVERSED IN SAME DIRECTION AS LINE 149)

AREA NUMBER = 52

DEFINE AREA BY LIST OF LINES

LINE LIST = 151 139 152 140
(TRAVERSED IN SAME DIRECTION AS LINE 151)

AREA NUMBER = 53

DEFINE AREA BY LIST OF LINES

LINE LIST = 152 138 153 141
(TRAVERSED IN SAME DIRECTION AS LINE 152)

AREA NUMBER = 54

Define edge half-tube

(K's 107,108,109,110,111,112,113,114,115,116,117)

(L's 154,155,156,157,158,159,160,161,162,163,164,165)

(166,167,168,169)

(A's 55,56,57,58,59,60)

KEYPOINT	107	X,Y,Z=	0.000000E+00	0.715213	0.000000E+00	IN CSYS=	0
KEYPOINT	108	X,Y,Z=	0.762000E-01	0.715213	0.000000E+00	IN CSYS=	0
KEYPOINT	109	X,Y,Z=	0.000000E+00	0.562813	0.000000E+00	IN CSYS=	0
KEYPOINT	110	X,Y,Z=	0.762000E-01	0.562813	0.000000E+00	IN CSYS=	0
KEYPOINT	111	X,Y,Z=	0.000000E+00	0.721563	0.000000E+00	IN CSYS=	0
KEYPOINT	112	X,Y,Z=	0.825500E-01	0.721563	0.000000E+00	IN CSYS=	0
KEYPOINT	113	X,Y,Z=	0.000000E+00	0.556463	0.000000E+00	IN CSYS=	0
KEYPOINT	114	X,Y,Z=	0.825500E-01	0.556463	0.000000E+00	IN CSYS=	0
KEYPOINT	115	X,Y,Z=	0.889000E-01	0.721563	0.000000E+00	IN CSYS=	0
KEYPOINT	116	X,Y,Z=	0.000000E+00	0.550113	0.000000E+00	IN CSYS=	0
KEYPOINT	117	X,Y,Z=	0.889000E-01	0.550113	0.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS 116 113

LINE NO.=	154	KP1=	116	TAN1=	0.0000	-1.0000	0.0000
		KP2=	113	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 113 109

LINE NO.=	155	KP1=	113	TAN1=	0.0000	-1.0000	0.0000
		KP2=	109	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 107 111

LINE NO.=	156	KP1=	107	TAN1=	0.0000	-1.0000	0.0000
		KP2=	111	TAN2=	0.0000	1.0000	0.0000

LINE CONNECTS KEYPOINTS 114 117

LINE NO.=	157	KP1=	114	TAN1=	-0.7071	0.7071	0.0000
		KP2=	117	TAN2=	0.7071	-0.7071	0.0000

LINE CONNECTS KEYPOINTS 110 114

LINE NO.=	158	KP1=	110	TAN1=	-0.7071	0.7071	0.0000
		KP2=	114	TAN2=	0.7071	-0.7071	0.0000

LINE CONNECTS KEYPOINTS 112 115

LINE NO.=	159	KP1=	112	TAN1=	-1.0000	0.0000	0.0000

	KP2=	115	TAN2=	1.0000	0.0000	0.0000
LINE CONNECTS KEYPOINTS 108 112						
LINE NO.=	160	KP1=	108	TAN1=	-0.7071	-0.7071 0.0000
		KP2=	112	TAN2=	0.7071	0.7071 0.0000
LINE CONNECTS KEYPOINTS 116 117						
LINE NO.=	161	KP1=	116	TAN1=	-1.0000	0.0000 0.0000
		KP2=	117	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS 113 114						
LINE NO.=	162	KP1=	113	TAN1=	-1.0000	0.0000 0.0000
		KP2=	114	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS 109 110						
LINE NO.=	163	KP1=	109	TAN1=	-1.0000	0.0000 0.0000
		KP2=	110	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS 108 107						
LINE NO.=	164	KP1=	108	TAN1=	1.0000	0.0000 0.0000
		KP2=	107	TAN2=	-1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS 111 112						
LINE NO.=	165	KP1=	111	TAN1=	-1.0000	0.0000 0.0000
		KP2=	112	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS 109 107						
LINE NO.=	166	KP1=	109	TAN1=	0.0000	-1.0000 0.0000
		KP2=	107	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS 110 108						
LINE NO.=	167	KP1=	110	TAN1=	0.0000	-1.0000 0.0000
		KP2=	108	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS 114 112						
LINE NO.=	168	KP1=	114	TAN1=	0.0000	-1.0000 0.0000
		KP2=	112	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS 115 117						
LINE NO.=	169	KP1=	115	TAN1=	0.0000	1.0000 0.0000
		KP2=	117	TAN2=	0.0000	-1.0000 0.0000

DEFINE AREA BY LIST OF LINES

LINE LIST = 166 163 167 164
(TRAVERSED IN SAME DIRECTION AS LINE 166)

AREA NUMBER = 55

DEFINE AREA BY LIST OF LINES

LINE LIST = 161 157 162 154
(TRAVERSED IN SAME DIRECTION AS LINE 161)

AREA NUMBER = 56

DEFINE AREA BY LIST OF LINES

LINE LIST = 162 158 163 155
(TRAVERSED IN SAME DIRECTION AS LINE 162)

AREA NUMBER = 57

DEFINE AREA BY LIST OF LINES

LINE LIST = 164 160 165 156
(TRAVERSED IN SAME DIRECTION AS LINE 164)

AREA NUMBER = 58

DEFINE AREA BY LIST OF LINES

LINE LIST = 167 158 168 160
(TRAVERSED IN SAME DIRECTION AS LINE 167)

AREA NUMBER = 59

DEFINE AREA BY LIST OF LINES

LINE LIST = 168 157 169 159

(TRAVERSED IN SAME DIRECTION AS LINE 168)

AREA NUMBER = 60

Define edge full-tube

(K's 118,119,120,121,122,123,124,125,126,127,128,129)

(L's 170,171,172,173,174,175,176,177,178,179,180,181)

(182,183,184,185,186,187,188)

(A's 61,62,63,64,65,66,67,68)

KEYPOINT	118	X,Y,Z=	0.471526	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	119	X,Y,Z=	0.623926	0.150876E-01	0.000000E+00	IN CSYS=	0
KEYPOINT	120	X,Y,Z=	0.471526	0.167488	0.000000E+00	IN CSYS=	0
KEYPOINT	121	X,Y,Z=	0.623926	0.167488	0.000000E+00	IN CSYS=	0
KEYPOINT	122	X,Y,Z=	0.465176	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	123	X,Y,Z=	0.630276	0.873760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	124	X,Y,Z=	0.465176	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	125	X,Y,Z=	0.630276	0.173838	0.000000E+00	IN CSYS=	0
KEYPOINT	126	X,Y,Z=	0.458826	0.238760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	127	X,Y,Z=	0.630276	0.238760E-02	0.000000E+00	IN CSYS=	0
KEYPOINT	128	X,Y,Z=	0.458826	0.180188	0.000000E+00	IN CSYS=	0
KEYPOINT	129	X,Y,Z=	0.630276	0.180188	0.000000E+00	IN CSYS=	0

LINE CONNECTS KEYPOINTS 122 126

LINE NO.=	170	KP1=	122	TAN1=	0.7071	0.7071	0.0000
		KP2=	126	TAN2=	-0.7071	-0.7071	0.0000

LINE CONNECTS KEYPOINTS 118 122

LINE NO.=	171	KP1=	118	TAN1=	0.7071	0.7071	0.0000
		KP2=	122	TAN2=	-0.7071	-0.7071	0.0000

LINE CONNECTS KEYPOINTS 120 124

LINE NO.=	172	KP1=	120	TAN1=	0.7071	-0.7071	0.0000
		KP2=	124	TAN2=	-0.7071	0.7071	0.0000

LINE CONNECTS KEYPOINTS 124 128

LINE NO.=	173	KP1=	124	TAN1=	0.7071	-0.7071	0.0000
		KP2=	128	TAN2=	-0.7071	0.7071	0.0000

LINE CONNECTS KEYPOINTS 123 127

LINE NO.=	174	KP1=	123	TAN1=	0.0000	1.0000	0.0000
		KP2=	127	TAN2=	0.0000	-1.0000	0.0000

LINE CONNECTS KEYPOINTS 119 123

LINE NO.=	175	KP1=	119	TAN1=	-0.7071	0.7071	0.0000
		KP2=	123	TAN2=	0.7071	-0.7071	0.0000

LINE CONNECTS KEYPOINTS 121 125

LINE NO.=	176	KP1=	121	TAN1=	-0.7071	-0.7071	0.0000
		KP2=	125	TAN2=	0.7071	0.7071	0.0000

LINE CONNECTS KEYPOINTS 129 125

LINE NO.=	177	KP1=	129	TAN1=	0.0000	1.0000	0.0000
		KP2=	125	TAN2=	0.0000	-1.0000	0.0000

LINE CONNECTS KEYPOINTS		127	126			
LINE NO.=	178	KP1=	127	TAN1=	1.0000	0.0000 0.0000
		KP2=	126	TAN2=	-1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		122	123			
LINE NO.=	179	KP1=	122	TAN1=	-1.0000	0.0000 0.0000
		KP2=	123	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		118	119			
LINE NO.=	180	KP1=	118	TAN1=	-1.0000	0.0000 0.0000
		KP2=	119	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		120	121			
LINE NO.=	181	KP1=	120	TAN1=	-1.0000	0.0000 0.0000
		KP2=	121	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		124	125			
LINE NO.=	182	KP1=	124	TAN1=	-1.0000	0.0000 0.0000
		KP2=	125	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		128	129			
LINE NO.=	183	KP1=	128	TAN1=	-1.0000	0.0000 0.0000
		KP2=	129	TAN2=	1.0000	0.0000 0.0000
LINE CONNECTS KEYPOINTS		126	128			
LINE NO.=	184	KP1=	126	TAN1=	0.0000	-1.0000 0.0000
		KP2=	128	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS		122	124			
LINE NO.=	185	KP1=	122	TAN1=	0.0000	-1.0000 0.0000
		KP2=	124	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS		118	120			
LINE NO.=	186	KP1=	118	TAN1=	0.0000	-1.0000 0.0000
		KP2=	120	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS		119	121			
LINE NO.=	187	KP1=	119	TAN1=	0.0000	-1.0000 0.0000
		KP2=	121	TAN2=	0.0000	1.0000 0.0000
LINE CONNECTS KEYPOINTS		125	123			
LINE NO.=	188	KP1=	125	TAN1=	0.0000	1.0000 0.0000
		KP2=	123	TAN2=	0.0000	-1.0000 0.0000

DEFINE AREA BY LIST OF LINES

LINE LIST = 180 187 181 186
(TRAVERSED IN SAME DIRECTION AS LINE 180)

AREA NUMBER = 61

DEFINE AREA BY LIST OF LINES

LINE LIST = 178 174 179 170
(TRAVERSED IN SAME DIRECTION AS LINE 178)

AREA NUMBER = 62

DEFINE AREA BY LIST OF LINES

LINE LIST = 179 175 180 171
(TRAVERSED IN SAME DIRECTION AS LINE 179)

AREA NUMBER = 63

DEFINE AREA BY LIST OF LINES

LINE LIST = 181 176 182 172
(TRAVERSED IN SAME DIRECTION AS LINE 181)

AREA NUMBER = 64

DEFINE AREA BY LIST OF LINES

LINE LIST = 182 177 183 173

```
(TRAVERSED IN SAME DIRECTION AS LINE 182)

AREA NUMBER = 65

DEFINE AREA BY LIST OF LINES
LINE LIST = 184 170 185 173
(TRAVERSED IN SAME DIRECTION AS LINE 184)

AREA NUMBER = 66

DEFINE AREA BY LIST OF LINES
LINE LIST = 185 171 186 172
(TRAVERSED IN SAME DIRECTION AS LINE 185)

AREA NUMBER = 67

DEFINE AREA BY LIST OF LINES
LINE LIST = 187 175 188 176
(TRAVERSED IN SAME DIRECTION AS LINE 187)

AREA NUMBER = 68

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF 0.10000E-03
*****
Set element shapes and sizes for tubes
8x8 mesh in fuel with 2
divisions per tube layer

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 130 TO 133 STEP 1

4 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 142 TO 153 STEP 1

16 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 166 TO 169 STEP 1

20 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 178 TO 188 STEP 1

31 LINES (OF 188 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 120 TO 125 STEP 1

6 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 161 TO 165 STEP 1

11 LINES (OF 188 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 116 TO 119 STEP 1
4 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 126 TO 129 STEP 1

8 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 134 TO 141 STEP 1

16 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 154 TO 160 STEP 1

23 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 170 TO 177 STEP 1

31 LINES (OF 188 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 188 STEP 1

188 LINES (OF 188 DEFINED) SELECTED BY LSEL COMMAND.

Mesh areas
first fuel, then stainless, then aluminum

MATERIAL NUMBER SET TO 14

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 39 TO 39 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 45
MAXIMUM ELEMENT NUMBER = 32

GENERATE NODES AND ELEMENTS
IN AREAS 46 TO 46 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 126
MAXIMUM ELEMENT NUMBER = 96

GENERATE NODES AND ELEMENTS
IN AREAS 55 TO 55 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 171
MAXIMUM ELEMENT NUMBER = 128

GENERATE NODES AND ELEMENTS
IN AREAS 61 TO 61 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 252
MAXIMUM ELEMENT NUMBER = 192

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 1

```

GENERATE NODES AND ELEMENTS
  IN AREAS      41 TO      42 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    272
MAXIMUM ELEMENT NUMBER      =    208

GENERATE NODES AND ELEMENTS
  IN AREAS      44 TO      44 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      1
MAXIMUM NODE NUMBER      =    286
MAXIMUM ELEMENT NUMBER      =    224

GENERATE NODES AND ELEMENTS
  IN AREAS      48 TO      49 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    322
MAXIMUM ELEMENT NUMBER      =    256

GENERATE NODES AND ELEMENTS
  IN AREAS      52 TO      53 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    350
MAXIMUM ELEMENT NUMBER      =    288

GENERATE NODES AND ELEMENTS
  IN AREAS      57 TO      59 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      3
MAXIMUM NODE NUMBER      =    384
MAXIMUM ELEMENT NUMBER      =    320

GENERATE NODES AND ELEMENTS
  IN AREAS      63 TO      64 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    420
MAXIMUM ELEMENT NUMBER      =    352

GENERATE NODES AND ELEMENTS
  IN AREAS      67 TO      68 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    448
MAXIMUM ELEMENT NUMBER      =    384

MATERIAL NUMBER SET TO      13

ELEMENT TYPE SET TO      1

GENERATE NODES AND ELEMENTS
  IN AREAS      40 TO      43 IN STEPS OF      3

NUMBER OF AREAS MESHED      =      2
MAXIMUM NODE NUMBER      =    468
MAXIMUM ELEMENT NUMBER      =    400

GENERATE NODES AND ELEMENTS
  IN AREAS      45 TO      45 IN STEPS OF      1

NUMBER OF AREAS MESHED      =      1
MAXIMUM NODE NUMBER      =    482
MAXIMUM ELEMENT NUMBER      =    416

GENERATE NODES AND ELEMENTS
  IN AREAS      47 TO      50 IN STEPS OF      3

```

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 518
 MAXIMUM ELEMENT NUMBER = 448

GENERATE NODES AND ELEMENTS
 IN AREAS 51 TO 54 IN STEPS OF 3

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 546
 MAXIMUM ELEMENT NUMBER = 480

GENERATE NODES AND ELEMENTS
 IN AREAS 56 TO 60 IN STEPS OF 4

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 572
 MAXIMUM ELEMENT NUMBER = 504

GENERATE NODES AND ELEMENTS
 IN AREAS 62 TO 65 IN STEPS OF 3

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 608
 MAXIMUM ELEMENT NUMBER = 536

GENERATE NODES AND ELEMENTS
 IN AREAS 66 TO 66 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
 MAXIMUM NODE NUMBER = 622
 MAXIMUM ELEMENT NUMBER = 552

Copy tube mesh

center half tube above and below
 (A's 69-75,76-82)

GENERATE 3 TOTAL SETS OF AREAS
 SET IS FROM 39 TO 45 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 848
 MAXIMUM ELEMENT NUMBER = 744
 (A's 83-89,90-96,97-103)

GENERATE 4 TOTAL SETS OF AREAS
 SET IS FROM 39 TO 45 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 -0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 1187
 MAXIMUM ELEMENT NUMBER = 1032

center fuel tube above and below
 (A's 104-112,113-121)

GENERATE 3 TOTAL SETS OF AREAS
 SET IS FROM 46 TO 54 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 1605
 MAXIMUM ELEMENT NUMBER = 1416
 (A's 122-130,131-139,140-148)

GENERATE 4 TOTAL SETS OF AREAS
 SET IS FROM 46 TO 54 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 -0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 2232
 MAXIMUM ELEMENT NUMBER = 1992

(A's 149-157)

GENERATE 2 TOTAL SETS OF AREAS
 SET IS FROM 46 TO 54 IN STEPS OF 1
 DX,DY,DZ= 0.183 0.000E+00 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 2441
 MAXIMUM ELEMENT NUMBER = 2184
 (A's 158-166,167-175)

GENERATE 3 TOTAL SETS OF AREAS
 SET IS FROM 149 TO 157 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 2859
 MAXIMUM ELEMENT NUMBER = 2568
 (A's 176-184,185-193,194-202)

GENERATE 4 TOTAL SETS OF AREAS
 SET IS FROM 149 TO 157 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 -0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 3486
 MAXIMUM ELEMENT NUMBER = 3144

side edge fuel tube above and below
 (A's 203-210)

GENERATE 2 TOTAL SETS OF AREAS
 SET IS FROM 61 TO 68 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 3681
 MAXIMUM ELEMENT NUMBER = 3320
 (A's 211-218,219-226)

GENERATE 3 TOTAL SETS OF AREAS
 SET IS FROM 61 TO 68 IN STEPS OF 1
 DX,DY,DZ= 0.000E+00 -0.183 0.000E+00 CSYS= 0

MAXIMUM NODE NUMBER = 4071
 MAXIMUM ELEMENT NUMBER = 3672

edge half tube bottom (13)
 (A's 227-232)

SYMMETRY TRANSFORMATION OF AREAS USING COMPONENT Y
 SET IS FROM 55 TO 60 IN STEPS OF 1

MAXIMUM NODE NUMBER = 4176
 MAXIMUM ELEMENT NUMBER = 3760

 Define thin stainless layers
 (K's 380,381,382,383,384,385,286,387,388,389, through 397)
 (A's 233 - 301)

KEYPOINT	380	X,Y,Z=	0.912876E-01	0.721563	0.000000E+00	IN CSYS= 0
KEYPOINT	381	X,Y,Z=	0.912876E-01	0.547726	0.000000E+00	IN CSYS= 0
KEYPOINT	382	X,Y,Z=	0.912876E-01	0.550113	0.000000E+00	IN CSYS= 0
KEYPOINT	383	X,Y,Z=	0.936752E-01	0.547726	0.000000E+00	IN CSYS= 0
KEYPOINT	384	X,Y,Z=	0.271475	0.547726	0.000000E+00	IN CSYS= 0
KEYPOINT	385	X,Y,Z=	0.276250	0.547726	0.000000E+00	IN CSYS= 0
KEYPOINT	386	X,Y,Z=	0.456438	0.547726	0.000000E+00	IN CSYS= 0

KEYPOINT	387	X,Y,Z=	0.456438	0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	388	X,Y,Z=	0.456438	0.367538	0.000000E+00	IN CSYS=	0
KEYPOINT	389	X,Y,Z=	0.458826	0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	390	X,Y,Z=	0.630276	0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	391	X,Y,Z=	0.630276	-0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	392	X,Y,Z=	0.458826	-0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	393	X,Y,Z=	0.456438	-0.367538	0.000000E+00	IN CSYS=	0
KEYPOINT	394	X,Y,Z=	0.456438	-0.365150	0.000000E+00	IN CSYS=	0
KEYPOINT	395	X,Y,Z=	0.456438	-0.547726	0.000000E+00	IN CSYS=	0
KEYPOINT	396	X,Y,Z=	0.276250	-0.547726	0.000000E+00	IN CSYS=	0
KEYPOINT	397	X,Y,Z=	0.271475	-0.547726	0.000000E+00	IN CSYS=	0
KEYPOINT	398	X,Y,Z=	0.936752E-01	-0.547726	0.000000E+00	IN CSYS=	0
KEYPOINT	399	X,Y,Z=	0.912876E-01	-0.550113	0.000000E+00	IN CSYS=	0
KEYPOINT	400	X,Y,Z=	0.912876E-01	-0.547726	0.000000E+00	IN CSYS=	0
KEYPOINT	401	X,Y,Z=	0.912876E-01	-0.721563	0.000000E+00	IN CSYS=	0

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 152 116 117 153

AREA NUMBER = 233

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 117 382 381 153

AREA NUMBER = 234

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 381 383 213 153

AREA NUMBER = 235

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 117 115 380 382

AREA NUMBER = 236

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 153 213 207 149

AREA NUMBER = 237

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 213 383 384 212

AREA NUMBER = 238

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 212 384 385 285

AREA NUMBER = 239

DEFINE AREA BY LIST OF KEYPOINTS

KEYPOINT LIST = 285 385 386 284

AREA NUMBER = 240
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 212 285 279 206
AREA NUMBER = 241
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 284 386 388 278
AREA NUMBER = 242
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 278 388 387 272
AREA NUMBER = 243
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 272 387 389 333
AREA NUMBER = 244
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 272 333 327 266
AREA NUMBER = 245
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 333 389 390 332
AREA NUMBER = 246
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 278 272 273 279
AREA NUMBER = 247
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 206 279 273 200
AREA NUMBER = 248
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 200 273 267 194
AREA NUMBER = 249
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 200 206 207 201
AREA NUMBER = 250
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 141 149 207 201
AREA NUMBER = 251
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 141 201 195 137
AREA NUMBER = 252
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 141 149 146 140
AREA NUMBER = 253
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 88 134 137 92

AREA NUMBER = 254
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 92 137 195 105
AREA NUMBER = 255
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 92 105 95 89
AREA NUMBER = 256
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 105 195 194 106
AREA NUMBER = 257
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 106 194 267 261
AREA NUMBER = 258
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 106 261 255 96
AREA NUMBER = 259
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 261 267 266 260
AREA NUMBER = 260
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 260 266 327 128
AREA NUMBER = 261
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 260 128 126 254
AREA NUMBER = 262
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 128 327 326 129
AREA NUMBER = 263
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 296 254 126 345
AREA NUMBER = 264
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 296 345 339 290
AREA NUMBER = 265
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 345 126 127 344
AREA NUMBER = 266
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 296 254 255 297
AREA NUMBER = 267
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 224 96 255 297

AREA NUMBER = 268
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 224 297 291 218
AREA NUMBER = 269
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 224 96 95 225
AREA NUMBER = 270
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 165 89 95 225
AREA NUMBER = 271
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 165 89 83 164
AREA NUMBER = 272
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 165 225 219 161
AREA NUMBER = 273
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 177 161 219 237
AREA NUMBER = 274
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 177 161 158 176
AREA NUMBER = 275
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 177 237 231 173
AREA NUMBER = 276
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 237 219 218 236
AREA NUMBER = 277
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 236 218 291 309
AREA NUMBER = 278
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 236 309 303 230
AREA NUMBER = 279
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 309 291 290 308
AREA NUMBER = 280
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 308 290 339 357
AREA NUMBER = 281
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 308 357 351 302

AREA NUMBER = 282
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 357 339 338 356
AREA NUMBER = 283
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 350 391 392 351
AREA NUMBER = 284
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 351 392 394 302
AREA NUMBER = 285
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 302 394 393 320
AREA NUMBER = 286
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 320 393 395 314
AREA NUMBER = 287
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 320 302 303 321
AREA NUMBER = 288
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 248 230 303 321
AREA NUMBER = 289
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 248 321 315 242
AREA NUMBER = 290
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 248 230 231 249
AREA NUMBER = 291
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 189 173 231 249
AREA NUMBER = 292
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 189 173 170 188
AREA NUMBER = 293
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 189 249 243 185
AREA NUMBER = 294
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 243 398 400 185
AREA NUMBER = 295
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 185 400 399 363

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AREA NUMBER = 296
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 363 185 182 362

AREA NUMBER = 297
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 363 399 401 368

AREA NUMBER = 298
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 398 243 242 397

AREA NUMBER = 299
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 242 315 396 397

AREA NUMBER = 300
DEFINE AREA BY LIST OF KEYPOINTS
KEYPOINT LIST = 315 314 395 396

AREA NUMBER = 301
MATERIAL NUMBER SET TO 1
ELEMENT TYPE SET TO 1

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

GENERATE NODES AND ELEMENTS
IN AREAS 233 TO 301 IN STEPS OF 1

NUMBER OF AREAS MESHED = 69
MAXIMUM NODE NUMBER = 4268
MAXIMUM ELEMENT NUMBER = 4123

MERGE COINCIDENT NODES WITHIN TOLERANCE OF 0.10000E-03

*** NOTE *** CP= 14.640 TIME= 09:22:41
Zero nodes were merged.

MERGE COINCIDENT KEYPOINTS WITHIN TOLERANCE OF 0.10000E-03
*****
Create mesh in tube guides
(L's 686,687,688)

DEFAULT ELEMENT DIVISIONS PER LINE = 2

SET DIVISIONS ON LINE 47 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 48 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 49 (IF SELECTED AND UNMESHED)
TO NDIV = 2, 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 = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 52 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000
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SET DIVISIONS ON LINE 53 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 54 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 55 (IF SELECTED AND UNMESHED)
TO NDIV = 18, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 56 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 57 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 58 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 59 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 60 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 61 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 62 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 63 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 64 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 65 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 66 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 67 (IF SELECTED AND UNMESHED)
TO NDIV = 9, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 68 (IF SELECTED AND UNMESHED)
TO NDIV = 9, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 69 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 70 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 71 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 72 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 73 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 74 (IF SELECTED AND UNMESHED)
TO NDIV = 38, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 75 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 76 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 77 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 78 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 79 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 80 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 81 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 82 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 83 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 84 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 85 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 86 (IF SELECTED AND UNMESHED)
TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 87 (IF SELECTED AND UNMESHED)
TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 88 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 89 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 90 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 91 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 92 (IF SELECTED AND UNMESHED)
TO NDIV = 13, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 93 (IF SELECTED AND UNMESHED)
TO NDIV = 9, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 94 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 95 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 96 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 97 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 98 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 99 (IF SELECTED AND UNMESHED)

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    TO NDIV = 9, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 100 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 101 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 102 (IF SELECTED AND UNMESHED)
    TO NDIV = 18, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 103 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 104 (IF SELECTED AND UNMESHED)
    TO NDIV = 8, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 105 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 106 (IF SELECTED AND UNMESHED)
    TO NDIV = 8, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 107 (IF SELECTED AND UNMESHED)
    TO NDIV = 13, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 108 (IF SELECTED AND UNMESHED)
    TO NDIV = 13, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 109 (IF SELECTED AND UNMESHED)
    TO NDIV = 13, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 110 (IF SELECTED AND UNMESHED)
    TO NDIV = 13, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 111 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 112 (IF SELECTED AND UNMESHED)
    TO NDIV = 4, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 113 (IF SELECTED AND UNMESHED)
    TO NDIV = 2, SPACING RATIO = 1.000
SET DIVISIONS ON LINE 114 (IF SELECTED AND UNMESHED)
    TO NDIV = 4, SPACING RATIO = 1.000
SELECT      FOR ITEM=LINE COMPONENT=
IN RANGE    58 TO      59 STEP      1
    2 LINES (OF 685 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    54 TO      54 STEP      1
    3 LINES (OF 685 DEFINED) SELECTED BY LSEL COMMAND.
CONCATENATE LINES
    LINE LIST = ALL SELECTED LINES
COMPOSITE LINE NO.= 686 KP1= 49 KP2= 52
SELECT      FOR ITEM=LINE COMPONENT=
IN RANGE    75 TO      76 STEP      1
    2 LINES (OF 686 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    79 TO      80 STEP      1

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4 LINES (OF 686 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 83 TO 84 STEP 1

6 LINES (OF 686 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 87 TO 87 STEP 1

7 LINES (OF 686 DEFINED) SELECTED BY LSEL COMMAND.

CONCATENATE LINES
LINE LIST = ALL SELECTED LINES

COMPOSITE LINE NO.= 687 KP1= 29 KP2= 36

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 104 TO 106 STEP 1

3 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

CONCATENATE LINES
LINE LIST = ALL SELECTED LINES

COMPOSITE LINE NO.= 688 KP1= 76 KP2= 73

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 688 STEP 1

688 LINES (OF 688 DEFINED) SELECTED BY LSEL COMMAND.

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 19 TO 38 IN STEPS OF 1

*** WARNING *** CP= 15.360 TIME= 09:22:42
Meshing of area 21 produced 10 poorly shaped elements.

*** NOTE *** CP= 15.360 TIME= 09:22:42
Worst shape angle is 25 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
4167 4168 4169 4170 4171 4185 4186 4187 4188 4189

*** WARNING *** CP= 15.590 TIME= 09:22:42
Meshing of area 27 produced 28 poorly shaped elements.

*** NOTE *** CP= 15.590 TIME= 09:22:42
Worst shape angle is 27 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
4274 4275 4276 4277 4278 4286 4287 4290 4291 4299
4300 4301 4302 4303 4312 4313 4314 4315 4316 4324
4325 4328 4329 4337 4338 4339 4340 4341

*** WARNING *** CP= 15.780 TIME= 09:22:42
Meshing of area 35 produced 10 poorly shaped elements.

*** NOTE *** CP= 15.780 TIME= 09:22:42
Worst shape angle is 25 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
4438 4439 4440 4441 4442 4443 4444 4445 4446 4447

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NUMBER OF AREAS MESHD = 20
 MAXIMUM NODE NUMBER = 4871
 MAXIMUM ELEMENT NUMBER = 4515

Create mesh in MPC shell
 (L's 689,690,691)

SET DIVISIONS ON LINE 22 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 23 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 25 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 27 (IF SELECTED AND UNMESHED)
 TO NDIV = 15, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 28 (IF SELECTED AND UNMESHED)
 TO NDIV = 12, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 29 (IF SELECTED AND UNMESHED)
 TO NDIV = 5, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 30 (IF SELECTED AND UNMESHED)
 TO NDIV = 11, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 32 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 34 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 36 (IF SELECTED AND UNMESHED)
 TO NDIV = 11, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 37 (IF SELECTED AND UNMESHED)
 TO NDIV = 5, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 38 (IF SELECTED AND UNMESHED)
 TO NDIV = 12, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 39 (IF SELECTED AND UNMESHED)
 TO NDIV = 15, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 41 (IF SELECTED AND UNMESHED)
 TO NDIV = 8, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 43 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 44 (IF SELECTED AND UNMESHED)
 TO NDIV = 4, SPACING RATIO = 1.000

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 22 TO 44 STEP 1

23 LINES (OF 688 DEFINED) SELECTED BY LSEL COMMAND.

CONCATENATE LINES
 LINE LIST = ALL SELECTED LINES

COMPOSITE LINE NO.= 689 KP1= 21 KP2= 44

ALL SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 1 TO 689 STEP 1

689 LINES (OF 689 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON LINE 17 (IF SELECTED AND UNMESHED)
TO NDIV = 73, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 18 (IF SELECTED AND UNMESHED)
TO NDIV = 73, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 21 (IF SELECTED AND UNMESHED)
TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 45 (IF SELECTED AND UNMESHED)
TO NDIV = 3, SPACING RATIO = 1.000

CONCATENATE LINES
LINES = 17 18

COMPOSITE LINE NO.= 690 KP1= 18 KP2= 20

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

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 6 TO 6 IN STEPS OF 1

*** WARNING *** CP= 18.040 TIME= 09:22:45
Meshing of area 6 produced 54 poorly shaped elements.

*** NOTE *** CP= 18.040 TIME= 09:22:45
Worst shape angle is 36 degrees.

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

4540	4541	4542	4543	4544	4545	4546	4547	4548	4612
4613	4614	4615	4616	4617	4651	4652	4653	4705	4706
4707	4708	4709	4710	4711	4712	4713	4756	4757	4758
4759	4760	4761	4762	4763	4764	4816	4817	4818	4852
4853	4854	4855	4856	4857	4921	4922	4923	4924	4925
4926	4927	4928	4929						

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 5430
MAXIMUM ELEMENT NUMBER = 4953
Assume vacuum between shell and inner barrier

SET DIVISIONS ON LINE 14 (IF SELECTED AND UNMESHED)
TO NDIV = 73, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 13 (IF SELECTED AND UNMESHED)
TO NDIV = 73, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 19 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 20 (IF SELECTED AND UNMESHED)
TO NDIV = 2, SPACING RATIO = 1.000

CONCATENATE LINES
LINES = 14 13

COMPOSITE LINE NO.= 691 KP1= 17 KP2= 15

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE ALL QUADRILATERAL OR BRICK ELEMENTS.
No MAT,7,

No TYPE,1,
 No AMESH,5,
 Delete concatenated lines
 (L's freed up 686,687,688,689,690,691)

DELETE SELECTED LINES FROM 686 TO 691 BY 1

DELETED 6 LINES

Create mesh in inner and outer barrier

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 7 TO 10 STEP 1

4 LINES (OF 685 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON ALL SELECTED UNMESHED LINES
 TO NDIV = 73, SPACING RATIO = 1.000

ALL SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 1 TO 691 STEP 1

685 LINES (OF 685 DEFINED) SELECTED BY LSEL COMMAND.

SET DIVISIONS ON LINE 6 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 15 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 16 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 5 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 11 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 12 (IF SELECTED AND UNMESHED)
 TO NDIV = 3, SPACING RATIO = 1.000

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 3 TO 4 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 6018
 MAXIMUM ELEMENT NUMBER = 5391

MATERIAL NUMBER SET TO 3

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
 IN AREAS 1 TO 2 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
 MAXIMUM NODE NUMBER = 6459
 MAXIMUM ELEMENT NUMBER = 5829

Create mesh in empty basket spaces

DEFAULT ELEMENT DIVISIONS PER LINE BASED ON ELEMENT SIZE = 0.100

SET DIVISIONS ON LINE 46 (IF SELECTED AND UNMESHED)
 TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 115 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE MIXED ELEMENT SHAPES. (MAY PRODUCE ALL QUADRILATERAL
OR ALL BRICK ELEMENTS UNDER CERTAIN CONDITIONS.)

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 7 TO 7 IN STEPS OF 1
** AREA 7 MESHED WITH 3 QUADRILATERALS, 1 TRIANGLES **

*** WARNING *** CP= 22.730 TIME= 09:22:49
Meshing of area 7 produced 1 poorly shaped elements.

*** NOTE *** CP= 22.730 TIME= 09:22:49
Worst aspect ratio is 21.0143598 : 1.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
5830

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 6459
MAXIMUM ELEMENT NUMBER = 5833

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE MIXED ELEMENT SHAPES. (MAY PRODUCE ALL QUADRILATERAL
OR ALL BRICK ELEMENTS UNDER CERTAIN CONDITIONS.)

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 8 TO 11 IN STEPS OF 1
** AREA 9 MESHED WITH 82 QUADRILATERALS, 21 TRIANGLES **
** AREA 10 MESHED WITH 78 QUADRILATERALS, 19 TRIANGLES **
** AREA 11 MESHED WITH 24 QUADRILATERALS, 7 TRIANGLES **

NUMBER OF AREAS MESHED = 4
MAXIMUM NODE NUMBER = 6704
MAXIMUM ELEMENT NUMBER = 6168

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

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 12 TO 13 IN STEPS OF 1

NUMBER OF AREAS MESHED = 2
MAXIMUM NODE NUMBER = 6746
MAXIMUM ELEMENT NUMBER = 6232

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE MIXED ELEMENT SHAPES. (MAY PRODUCE ALL QUADRILATERAL
OR ALL BRICK ELEMENTS UNDER CERTAIN CONDITIONS.)

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS

IN AREAS 14 TO 16 IN STEPS OF 1
 ** AREA 14 MESHED WITH 25 QUADRILATERALS, 11 TRIANGLES **
 ** AREA 15 MESHED WITH 74 QUADRILATERALS, 23 TRIANGLES **
 ** AREA 16 MESHED WITH 75 QUADRILATERALS, 21 TRIANGLES **

NUMBER OF AREAS MESHED = 3
 MAXIMUM NODE NUMBER = 6901
 MAXIMUM ELEMENT NUMBER = 6461

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

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS

IN AREAS 17 TO 17 IN STEPS OF 1

NUMBER OF AREAS MESHED = 1
 MAXIMUM NODE NUMBER = 6985
 MAXIMUM ELEMENT NUMBER = 6565

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
 PRODUCE MIXED ELEMENT SHAPES. (MAY PRODUCE ALL QUADRILATERAL
 OR ALL BRICK ELEMENTS UNDER CERTAIN CONDITIONS.)

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS

IN AREAS 18 TO 18 IN STEPS OF 1
 ** AREA 18 MESHED WITH 3 QUADRILATERALS, 1 TRIANGLES **

*** WARNING *** CP= 24.590 TIME= 09:22:51
 Meshing of area 18 produced 1 poorly shaped elements.

*** NOTE *** CP= 24.590 TIME= 09:22:51
 Worst aspect ratio is 21.0143598 : 1.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
 6566

NUMBER OF AREAS MESHED = 1
 MAXIMUM NODE NUMBER = 6985
 MAXIMUM ELEMENT NUMBER = 6569

Define mesh and radiation surface elements for
 tube/guides gap
 (L's 686,687)
 (A's 302)

LINE CONNECTS KEYPOINTS 47 111
 LINE NO.= 686 KP1= 47 TAN1= 0.0000 1.0000 0.0000
 KP2= 111 TAN2= 0.0000 -1.0000 0.0000

LINE CONNECTS KEYPOINTS 366 82
 LINE NO.= 687 KP1= 366 TAN1= 0.0000 1.0000 0.0000
 KP2= 82 TAN2= 0.0000 -1.0000 0.0000
 Select lines around tubes

SELECT FOR ITEM=LINE COMPONENT=
 IN RANGE 686 TO 686 STEP 1

1 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 165 TO 165 STEP 1

2 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 159 TO 159 STEP 1

3 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 580 TO 580 STEP 1

4 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 581 TO 581 STEP 1

5 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 575 TO 575 STEP 1

6 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 577 TO 577 STEP 1

7 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 583 TO 583 STEP 1

8 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 585 TO 585 STEP 1

9 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 588 TO 588 STEP 1

10 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 591 TO 591 STEP 1

11 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 593 TO 593 STEP 1

12 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 596 TO 596 STEP 1

13 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 600 TO 600 STEP 1

14 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 601 TO 601 STEP 1

15 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 512 TO 512 STEP 1
16 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 517 TO 517 STEP 1
17 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 506 TO 506 STEP 1
18 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 624 TO 624 STEP 1
19 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 177 TO 177 STEP 1
20 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 188 TO 188 STEP 1
21 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 174 TO 174 STEP 1
22 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 629 TO 629 STEP 1
23 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 531 TO 531 STEP 1
24 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 536 TO 536 STEP 1
25 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 525 TO 525 STEP 1
26 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 652 TO 652 STEP 1
27 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 550 TO 550 STEP 1
28 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 555 TO 555 STEP 1
29 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 544 TO 544 STEP 1

30 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 653 TO 653 STEP 1

31 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 654 TO 654 STEP 1

32 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 656 TO 656 STEP 1

33 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 658 TO 658 STEP 1

34 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 661 TO 661 STEP 1

35 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 685 TO 685 STEP 1

36 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 684 TO 684 STEP 1

37 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 682 TO 682 STEP 1

38 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 673 TO 673 STEP 1

39 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 675 TO 675 STEP 1

40 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 679 TO 679 STEP 1

41 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 680 TO 680 STEP 1

42 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 570 TO 570 STEP 1

43 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=

IN RANGE 567 TO 567 STEP 1

44 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 687 TO 687 STEP 1

45 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
Select lines around tube guides

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 112 TO 112 STEP 1

46 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 111 TO 111 STEP 1

47 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

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

48 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 108 TO 108 STEP 1

49 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 102 TO 102 STEP 1

50 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 99 TO 99 STEP 1

51 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 90 TO 90 STEP 1

52 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 89 TO 89 STEP 1

53 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

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

54 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 88 TO 88 STEP 1

55 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 74 TO 74 STEP 1

56 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 73 TO 73 STEP 1

57 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

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

    58 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    72 TO    72 STEP    1

    59 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    71 TO    71 STEP    1

    60 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    68 TO    68 STEP    1

    61 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    55 TO    55 STEP    1

    62 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    51 TO    51 STEP    1

    63 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    23 TO    23 STEP    1

    64 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    49 TO    49 STEP    1

    65 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.

ALSO SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    50 TO    50 STEP    1

    66 LINES (OF    687 DEFINED) SELECTED BY LSEL COMMAND.
    Define area

DEFINE AREA BY LIST OF LINES
    LINE LIST = ALL SELECTED LINES
    (TRAVERSED IN SAME DIRECTION AS LINE    23)

    AREA NUMBER =    302
        Create radiation surface elements

SELECT    ALL NODES (INTERIOR TO LINE, AND AT KEYPOINTS)
    RELATED TO SELECTED LINE SET.

    339 NODES (OF    6985 DEFINED) SELECTED FROM
    66 SELECTED LINES BY NSLL COMMAND.

MATERIAL NUMBER SET TO    1

ELEMENT TYPE SET TO    7

GENERATE ELEMENTS ON SURFACE DEFINED BY SELECTED NODES
    TYPE=    7 REAL=    1 MATERIAL=    1 ESYS=    0

NUMBER OF ELEMENTS GENERATED=    337

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE    1 TO    691 STEP    1
```

687 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 6985 STEP 1

6985 NODES (OF 6985 DEFINED) SELECTED BY NSEL COMMAND.
Mesh gap

FOR ELEMENT TYPE(S) ALLOWING MULTIPLE SHAPES:
PRODUCE MIXED ELEMENT SHAPES. (MAY PRODUCE ALL QUADRILATERAL
OR ALL BRICK ELEMENTS UNDER CERTAIN CONDITIONS.)

SET DIVISIONS ON LINE 686 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

SET DIVISIONS ON LINE 687 (IF SELECTED AND UNMESHED)
TO NDIV = 1, SPACING RATIO = 1.000

MATERIAL NUMBER SET TO 7

ELEMENT TYPE SET TO 1

GENERATE NODES AND ELEMENTS
IN AREAS 302 TO 302 IN STEPS OF 1
** AREA 302 MESHED WITH 103 QUADRILATERALS, 193 TRIANGLES **

*** WARNING *** CP= 33.730 TIME= 09:23:00
Meshing of area 302 produced 7 poorly shaped elements.

*** NOTE *** CP= 33.730 TIME= 09:23:00
Worst aspect ratio is 92.192168 : 1.

*** NOTE *** CP= 33.730 TIME= 09:23:00
Worst shape angle is 2 degrees.

*** LIST OF ELEMENTS WITH POOR SHAPE ***
6914 6922 7110 7133 7159 7197 7198

NUMBER OF AREAS MESHED = 1
MAXIMUM NODE NUMBER = 7016
MAXIMUM ELEMENT NUMBER = 7202

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

Create other radiation surface elements
Basket spaces

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 17

GENERATE NODES AND ELEMENTS
ON LINES 22 TO 22 IN STEPS OF 1

NUMBER OF LINES MESHED = 1
MAXIMUM NODE NUMBER = 7016
MAXIMUM ELEMENT NUMBER = 7206

GENERATE NODES AND ELEMENTS
ON LINES 25 TO 27 IN STEPS OF 2

NUMBER OF LINES MESHED = 2
MAXIMUM NODE NUMBER = 7016
MAXIMUM ELEMENT NUMBER = 7229

GENERATE NODES AND ELEMENTS
ON LINES 28 TO 38 IN STEPS OF 2

NUMBER OF LINES MESHED = 6
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7291

GENERATE NODES AND ELEMENTS
 ON LINES 39 TO 41 IN STEPS OF 2

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7314

GENERATE NODES AND ELEMENTS
 ON LINES 44 TO 44 IN STEPS OF 1

NUMBER OF LINES MESHED = 1
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7318

GENERATE NODES AND ELEMENTS
 ON LINES 46 TO 48 IN STEPS OF 2

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7323

GENERATE NODES AND ELEMENTS
 ON LINES 53 TO 54 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7344

GENERATE NODES AND ELEMENTS
 ON LINES 56 TO 57 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7370

GENERATE NODES AND ELEMENTS
 ON LINES 59 TO 59 IN STEPS OF 1

NUMBER OF LINES MESHED = 1
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7378

GENERATE NODES AND ELEMENTS
 ON LINES 61 TO 64 IN STEPS OF 1

NUMBER OF LINES MESHED = 4
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7384

GENERATE NODES AND ELEMENTS
 ON LINES 67 TO 70 IN STEPS OF 3

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7406

GENERATE NODES AND ELEMENTS
 ON LINES 75 TO 75 IN STEPS OF 1

NUMBER OF LINES MESHED = 1
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7414

GENERATE NODES AND ELEMENTS
 ON LINES 77 TO 79 IN STEPS OF 1

NUMBER OF LINES MESHED = 3
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7430

GENERATE NODES AND ELEMENTS
 ON LINES 81 TO 83 IN STEPS OF 1

NUMBER OF LINES MESHED = 3
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7446

GENERATE NODES AND ELEMENTS
 ON LINES 85 TO 87 IN STEPS OF 1

NUMBER OF LINES MESHED = 3
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7462

GENERATE NODES AND ELEMENTS
 ON LINES 92 TO 97 IN STEPS OF 1

NUMBER OF LINES MESHED = 6
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7490

GENERATE NODES AND ELEMENTS
 ON LINES 104 TO 104 IN STEPS OF 1

NUMBER OF LINES MESHED = 1
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7498

GENERATE NODES AND ELEMENTS
 ON LINES 106 TO 107 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7519

GENERATE NODES AND ELEMENTS
 ON LINES 109 TO 110 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7545

GENERATE NODES AND ELEMENTS
 ON LINES 114 TO 115 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7550

MPC shell/inner barrier gap

MATERIAL NUMBER SET TO 1

ELEMENT TYPE SET TO 27

GENERATE NODES AND ELEMENTS
 ON LINES 17 TO 18 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
 MAXIMUM NODE NUMBER = 7016
 MAXIMUM ELEMENT NUMBER = 7696

MATERIAL NUMBER SET TO 2

ELEMENT TYPE SET TO 27

GENERATE NODES AND ELEMENTS
ON LINES 13 TO 14 IN STEPS OF 1

NUMBER OF LINES MESHED = 2
MAXIMUM NODE NUMBER = 7016
MAXIMUM ELEMENT NUMBER = 7842

***** ROUTINE COMPLETED ***** CP = 33.990

Create element mesh plots to illustrate model
View mesh for entire model

GRAPHIC DISPLAY RESET
XYZ TRIAD DISPLAY SET TO OFF

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER

MAT NUMBERING KEY = 1

HIDDEN DISPLAY (CENTROIDAL SORT) IN WINDOW 1

ELEMENT OUTLINE STYLE FOR WINDOW 1 IS 0 0=DEFAULT, 1=ALTERNATE, -1=NONE

FOCUS POINT FOR WINDOW 1 .90080E-01 .00000E+00 .00000E+00

TITLE=
40 BWR MPC/Waste Package - 1/2 FEM Model

/SHOW SWITCH PLOTS TO FILE meshfull.grph - VECTOR MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshfull.grph - VECTOR MODE.
DISPLAY TITLE=
40 BWR MPC/Waste Package - 1/2 FEM Model

UNSELECT FOR ITEM=MAT COMPONENT=
IN RANGE 7 TO 7 STEP 1

6806 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

/SHOW SWITCH PLOTS TO FILE meshgap.grph - VECTOR MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshgap.grph - VECTOR MODE.
DISPLAY TITLE=
40 BWR MPC/Waste Package - 1/2 FEM Model
View mesh for radiation substructure

MAT NUMBERING KEY = 0

TYPE NUMBERING KEY = 1

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 7 TO 7 STEP 1

337 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 17 TO 17 STEP 1

685 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 27 TO 27 STEP 1

977 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

TITLE=
40 BWR MPC/Waste Package - Radiation Matrix

/SHOW SWITCH PLOTS TO FILE meshrad.grph - VECTOR MODE.
- GRAPHIC PLANES = 8.

PRODUCE ELEMENT PLOT IN DSYS = 0

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE meshrad.grph - VECTOR MODE.
DISPLAY TITLE=
40 BWR MPC/Waste Package - Radiation Matrix

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7842 STEP 1

7842 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

TITLE=
40 BWR MPC/Waste Package with 10 yr old, MOX SNF

Generate super-elements

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:23:06 JUN 26, 1996 CP= 39.350
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

***** ANSYS RADIATION MATRIX UTILITY (AUX12) *****

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 7 TO 7 STEP 1

337 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

339 NODES (OF 7016 DEFINED) SELECTED FROM
337 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= 0.56700E-07

TWO DIMENSIONAL PLANE GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 800

WRITE RADIATION MATRIX TO FILE= tubegap.sub

*** NOTE *** CP= 39.560 TIME= 09:23:06
No space node defined. An enclosed system should not have a space
node. For an open system a space node is required to account for
radiation losses to space.

NUMBER OF ELEMENTS= 337 NUMBER OF NODES= 339

800 ZONES CREATE 1600 RAYS

SELECT FOR ITEM=TYPE COMPONENT=

IN RANGE 17 TO 17 STEP 1

348 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

346 NODES (OF 7016 DEFINED) SELECTED FROM
348 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= 0.56700E-07

TWO DIMENSIONAL PLANE GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 800

WRITE RADIATION MATRIX TO FILE= spaces.sub

*** NOTE *** CP= 48.970 TIME= 09:23:16
No space node defined. An enclosed system should not have a space
node. For an open system a space node is required to account for
radiation losses to space.

NUMBER OF ELEMENTS= 348 NUMBER OF NODES= 346

800 ZONES CREATE 1600 RAYS

SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 27 TO 27 STEP 1

292 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

SELECT ALL NODES HAVING ANY ELEMENT IN ELEMENT SET.

294 NODES (OF 7016 DEFINED) SELECTED FROM
292 SELECTED ELEMENTS BY NSLE COMMAND.

STEFAN-BOLTZMANN CONSTANT= 0.56700E-07

TWO DIMENSIONAL PLANE GEOMETRY

HIDDEN SURFACE (SLOW) METHOD
NUMBER OF ZONES= 800

WRITE RADIATION MATRIX TO FILE= shellgap.sub

*** NOTE *** CP= 60.710 TIME= 09:23:29
No space node defined. An enclosed system should not have a space
node. For an open system a space node is required to account for
radiation losses to space.

NUMBER OF ELEMENTS= 292 NUMBER OF NODES= 294

800 ZONES CREATE 1600 RAYS

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7842 STEP 1

7842 ELEMENTS (OF 7842 DEFINED) SELECTED BY ESEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 7016 STEP 1

7016 NODES (OF 7016 DEFINED) SELECTED BY NSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 68.230

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:23:37 JUN 26, 1996 CP= 68.230
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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

ELEMENT TYPE SET TO 18
SUPERELEMENT 7843 tubegap NODE TOLERANCE = 0.10000E-03
STORE DOFS OF SUPERELEMENT 7843
CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL
STORE NODES OF SUPERELEMENT 7843
SUPERELEMENT 7844 spaces NODE TOLERANCE = 0.10000E-03
STORE DOFS OF SUPERELEMENT 7844
CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL
STORE NODES OF SUPERELEMENT 7844
SUPERELEMENT 7845 shellgap NODE TOLERANCE = 0.10000E-03
STORE DOFS OF SUPERELEMENT 7845
CURRENT NODAL DOF SET IS TEMP
THREE-DIMENSIONAL MODEL
STORE NODES OF SUPERELEMENT 7845
Delete radiation edge elements
SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 7 TO 7 STEP 1
337 ELEMENTS (OF 7845 DEFINED) SELECTED BY ESEL COMMAND.
DELETE ALL SELECTED ELEMENTS.
ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7845 STEP 1
7508 ELEMENTS (OF 7508 DEFINED) SELECTED BY ESEL COMMAND.
SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 17 TO 17 STEP 1
48 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
ALSO SELECT FOR ITEM=TYPE COMPONENT=
IN RANGE 27 TO 27 STEP 1
52 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.
CLEAR NODES AND ELEMENTS FROM ALL SELECTED LINES
*** NOTE *** CP= 68.640 TIME= 09:23:37
Nodes cannot be cleared from line 13 because area 3 is meshed. Only
elements are deleted.
*** NOTE *** CP= 68.650 TIME= 09:23:37
Nodes cannot be cleared from line 14 because area 4 is meshed. Only

elements are deleted.

*** NOTE *** CP= 68.670 TIME= 09:23:37
Nodes cannot be cleared from line 17 because area 6 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.680 TIME= 09:23:37
Nodes cannot be cleared from line 18 because area 6 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 22 because area 7 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 25 because area 8 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 27 because area 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 28 because area 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 30 because area 11 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.700 TIME= 09:23:37
Nodes cannot be cleared from line 32 because area 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.710 TIME= 09:23:37
Nodes cannot be cleared from line 34 because area 13 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.710 TIME= 09:23:37
Nodes cannot be cleared from line 36 because area 14 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.710 TIME= 09:23:37
Nodes cannot be cleared from line 38 because area 15 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.720 TIME= 09:23:37
Nodes cannot be cleared from line 39 because area 16 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.720 TIME= 09:23:37
Nodes cannot be cleared from line 41 because area 17 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.730 TIME= 09:23:37
Nodes cannot be cleared from line 44 because area 18 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.730 TIME= 09:23:37
Nodes cannot be cleared from line 46 because area 7 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.730 TIME= 09:23:37
Nodes cannot be cleared from line 48 because area 7 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.730 TIME= 09:23:37
Nodes cannot be cleared from line 53 because area 8 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.740 TIME= 09:23:37
Nodes cannot be cleared from line 54 because area 8 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.740 TIME= 09:23:37
Nodes cannot be cleared from line 56 because area 8 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.740 TIME= 09:23:37
Nodes cannot be cleared from line 57 because area 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.750 TIME= 09:23:37
Nodes cannot be cleared from line 59 because area 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.750 TIME= 09:23:37
Nodes cannot be cleared from line 61 because area 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.750 TIME= 09:23:37
Nodes cannot be cleared from line 62 because area 9 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.750 TIME= 09:23:37
Nodes cannot be cleared from line 63 because area 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.750 TIME= 09:23:37
Nodes cannot be cleared from line 64 because area 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.760 TIME= 09:23:37
Nodes cannot be cleared from line 67 because area 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.760 TIME= 09:23:37
Nodes cannot be cleared from line 70 because area 10 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.760 TIME= 09:23:37
Nodes cannot be cleared from line 75 because area 11 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.770 TIME= 09:23:37
Nodes cannot be cleared from line 77 because area 11 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.770 TIME= 09:23:37
Nodes cannot be cleared from line 78 because area 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.770 TIME= 09:23:37
Nodes cannot be cleared from line 79 because area 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.770 TIME= 09:23:37
Nodes cannot be cleared from line 81 because area 12 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.780 TIME= 09:23:37
Nodes cannot be cleared from line 82 because area 13 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.780 TIME= 09:23:37
Nodes cannot be cleared from line 83 because area 13 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.780 TIME= 09:23:37
Nodes cannot be cleared from line 85 because area 13 is meshed. Only

elements are deleted.

*** NOTE *** CP= 68.780 TIME= 09:23:37
Nodes cannot be cleared from line 86 because area 14 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.790 TIME= 09:23:37
Nodes cannot be cleared from line 87 because area 14 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.790 TIME= 09:23:37
Nodes cannot be cleared from line 92 because area 15 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.790 TIME= 09:23:37
Nodes cannot be cleared from line 93 because area 15 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.800 TIME= 09:23:37
Nodes cannot be cleared from line 94 because area 15 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.800 TIME= 09:23:37
Nodes cannot be cleared from line 95 because area 15 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.800 TIME= 09:23:37
Nodes cannot be cleared from line 96 because area 16 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.800 TIME= 09:23:37
Nodes cannot be cleared from line 97 because area 16 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.800 TIME= 09:23:37
Nodes cannot be cleared from line 104 because area 16 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.810 TIME= 09:23:37
Nodes cannot be cleared from line 106 because area 17 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.810 TIME= 09:23:37
Nodes cannot be cleared from line 107 because area 17 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.810 TIME= 09:23:37
Nodes cannot be cleared from line 109 because area 17 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.820 TIME= 09:23:37
Nodes cannot be cleared from line 110 because area 16 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.820 TIME= 09:23:37
Nodes cannot be cleared from line 114 because area 18 is meshed. Only
elements are deleted.

*** NOTE *** CP= 68.820 TIME= 09:23:37
Nodes cannot be cleared from line 115 because area 18 is meshed. Only
elements are deleted.

CLEARED 52 LINES, 0 KEYPOINTS

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 691 STEP 1

687 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

***** ROUTINE COMPLETED ***** CP = 68.830

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= 68.830 TIME= 09:23:37
Damping (if present) may be ignored only in reduced transient analyses.

PERFORM A FULL TRANSIENT ANALYSIS

TEMPERATURE OFFSET FROM ABSOLUTE ZERO= 273.150

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 7 TO 7 STEP 1

1 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

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

2 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

SELECT ALL NODES (INTERIOR TO LINE, AND AT KEYPOINTS)
RELATED TO SELECTED LINE SET.

147 NODES (OF 7016 DEFINED) SELECTED FROM
2 SELECTED LINES BY NSLL COMMAND.

SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES 1 TO 7016 BY 1
REAL= 26.1379438 IMAG= 0.000000000E+00

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 691 STEP 1

687 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 7016 STEP 1

7016 NODES (OF 7016 DEFINED) SELECTED BY NSEL COMMAND.

SELECT FOR ITEM=MAT COMPONENT=
IN RANGE 14 TO 14 STEP 1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM
24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
4043.84011 0.000000000E+00 0.000000000E+00 0.000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=

IN RANGE 1 TO 302 STEP 1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=

IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= 0.10000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE COMMAND *****

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4167 has an angle between adjacent edges of 156.60 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4167 has a poor shape angle of 34.0051342 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4168 has an angle between adjacent edges of 153.68 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4168 has a poor shape angle of 24.7792385 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4169 has an angle between adjacent edges of 150.01 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4169 has a poor shape angle of 28.0417505 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4170 has an angle between adjacent edges of 145.30 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4170 has a poor shape angle of 32.1899611 degrees.

*** WARNING *** CP= 70.780 TIME= 09:23:39
Element 4171 has an angle between adjacent edges of 139.12 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39
Element 4171 has a poor shape angle of 37.5737968 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39
Element 4172 has an angle between adjacent edges of 40.88 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39
Element 4185 has an angle between adjacent edges of 155.92 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39
Element 4185 has a poor shape angle of 34.9507761 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39
Element 4186 has an angle between adjacent edges of 152.95 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.790 TIME= 09:23:39

Element 4186 has a poor shape angle of 25.4825808 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4187 has an angle between adjacent edges of 149.22 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4187 has a poor shape angle of 28.8075315 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4188 has an angle between adjacent edges of 144.44 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4188 has a poor shape angle of 33.0203374 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4189 has an angle between adjacent edges of 138.22 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4189 has a poor shape angle of 38.4614274 degrees.

*** WARNING *** CP= 70.800 TIME= 09:23:39
Element 4190 has an angle between adjacent edges of 41.78 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4273 has an angle between adjacent edges of 43.81 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4274 has an angle between adjacent edges of 37.50 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4274 has a poor shape angle of 40.4537991 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4275 has an angle between adjacent edges of 32.60 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4275 has a poor shape angle of 34.9016729 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4276 has an angle between adjacent edges of 28.73 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.820 TIME= 09:23:39
Element 4276 has a poor shape angle of 30.554281 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4277 has an angle between adjacent edges of 25.62 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4277 has a poor shape angle of 27.0948416 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4278 has an angle between adjacent edges of 154.38 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4278 has a poor shape angle of 36.6567354 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4286 has an angle between adjacent edges of 40.11 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4286 has a poor shape angle of 43.8914294 degrees.

*** WARNING *** CP= 70.830 TIME= 09:23:39
Element 4287 has an angle between adjacent edges of 34.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4287 has a poor shape angle of 36.840787 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4288 has an angle between adjacent edges of 146.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4289 has an angle between adjacent edges of 146.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4290 has an angle between adjacent edges of 139.89 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4290 has a poor shape angle of 36.840787 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4291 has an angle between adjacent edges of 40.11 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.840 TIME= 09:23:39
Element 4291 has a poor shape angle of 43.8914294 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4299 has an angle between adjacent edges of 154.38 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4299 has a poor shape angle of 36.6567354 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4300 has an angle between adjacent edges of 151.27 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4300 has a poor shape angle of 27.0948416 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4301 has an angle between adjacent edges of 147.40 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4301 has a poor shape angle of 30.554281 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4302 has an angle between adjacent edges of 142.50 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.850 TIME= 09:23:39
Element 4302 has a poor shape angle of 34.9016729 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4303 has an angle between adjacent edges of 136.19 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4303 has a poor shape angle of 40.4537991 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4304 has an angle between adjacent edges of 43.81 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4311 has an angle between adjacent edges of 43.81 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4312 has an angle between adjacent edges of 37.50 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4312 has a poor shape angle of 40.4537991 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4313 has an angle between adjacent edges of 32.60 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.860 TIME= 09:23:39
Element 4313 has a poor shape angle of 34.9016729 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4314 has an angle between adjacent edges of 28.73 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4314 has a poor shape angle of 30.554281 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4315 has an angle between adjacent edges of 25.62 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4315 has a poor shape angle of 27.0948416 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4316 has an angle between adjacent edges of 154.38 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4316 has a poor shape angle of 36.6567354 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4324 has an angle between adjacent edges of 40.11 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.870 TIME= 09:23:39
Element 4324 has a poor shape angle of 43.8914294 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4325 has an angle between adjacent edges of 34.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4325 has a poor shape angle of 36.840787 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4326 has an angle between adjacent edges of 146.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4327 has an angle between adjacent edges of 146.00 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4328 has an angle between adjacent edges of 139.89 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4328 has a poor shape angle of 36.840787 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39

Element 4329 has an angle between adjacent edges of 40.11 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.880 TIME= 09:23:39
Element 4329 has a poor shape angle of 43.8914294 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4337 has an angle between adjacent edges of 154.38 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4337 has a poor shape angle of 36.6567354 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4338 has an angle between adjacent edges of 151.27 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4338 has a poor shape angle of 27.0948416 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4339 has an angle between adjacent edges of 147.40 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4339 has a poor shape angle of 30.554281 degrees.

*** WARNING *** CP= 70.890 TIME= 09:23:39
Element 4340 has an angle between adjacent edges of 142.50 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.900 TIME= 09:23:39
Element 4340 has a poor shape angle of 34.9016729 degrees.

*** WARNING *** CP= 70.900 TIME= 09:23:39
Element 4341 has an angle between adjacent edges of 136.19 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.900 TIME= 09:23:39
Element 4341 has a poor shape angle of 40.4537991 degrees.

*** WARNING *** CP= 70.900 TIME= 09:23:39
Element 4342 has an angle between adjacent edges of 43.81 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.910 TIME= 09:23:39
Element 4438 has an angle between adjacent edges of 156.60 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4438 has a poor shape angle of 34.0051342 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4439 has an angle between adjacent edges of 155.92 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4439 has a poor shape angle of 34.9507761 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4440 has an angle between adjacent edges of 153.68 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4440 has a poor shape angle of 24.7792385 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4441 has an angle between adjacent edges of 152.95 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4441 has a poor shape angle of 25.4825808 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4442 has an angle between adjacent edges of 150.01 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.920 TIME= 09:23:39
Element 4442 has a poor shape angle of 28.0417505 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4443 has an angle between adjacent edges of 149.22 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4443 has a poor shape angle of 28.8075315 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4444 has an angle between adjacent edges of 145.30 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4444 has a poor shape angle of 32.1899611 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4445 has an angle between adjacent edges of 144.44 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4445 has a poor shape angle of 33.0203374 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4446 has an angle between adjacent edges of 139.12 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.930 TIME= 09:23:39
Element 4446 has a poor shape angle of 37.5737968 degrees.

*** WARNING *** CP= 70.940 TIME= 09:23:39
Element 4447 has an angle between adjacent edges of 138.22 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.940 TIME= 09:23:39
Element 4447 has a poor shape angle of 38.4614274 degrees.

*** WARNING *** CP= 70.940 TIME= 09:23:39
Element 4448 has an angle between adjacent edges of 139.12 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.940 TIME= 09:23:39
Element 4449 has an angle between adjacent edges of 138.22 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.950 TIME= 09:23:39
Element 4540 has an angle between adjacent edges of 145.85 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.950 TIME= 09:23:39
Element 4540 has a poor shape angle of 39.9243452 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4541 has an angle between adjacent edges of 145.05 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4541 has a poor shape angle of 40.2201054 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4542 has an angle between adjacent edges of 145.16 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4542 has a poor shape angle of 40.554148 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4543 has an angle between adjacent edges of 141.51 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4543 has a poor shape angle of 37.271783 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4544 has an angle between adjacent edges of 141.28 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.960 TIME= 09:23:39
Element 4544 has a poor shape angle of 37.5734654 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4545 has an angle between adjacent edges of 141.32 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4545 has a poor shape angle of 37.5868446 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4546 has an angle between adjacent edges of 139.44 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4546 has a poor shape angle of 42.1701355 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4547 has an angle between adjacent edges of 139.02 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4547 has a poor shape angle of 42.3975482 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4548 has an angle between adjacent edges of 139.02 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.970 TIME= 09:23:39
Element 4548 has a poor shape angle of 42.4603886 degrees.

*** WARNING *** CP= 70.980 TIME= 09:23:39
Element 4609 has an angle between adjacent edges of 136.98 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4610 has an angle between adjacent edges of 136.79 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4611 has an angle between adjacent edges of 136.54 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4612 has an angle between adjacent edges of 137.84 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4612 has a poor shape angle of 43.5287486 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4613 has an angle between adjacent edges of 137.67 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39

Element 4613 has a poor shape angle of 43.704982 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4614 has an angle between adjacent edges of 137.42 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 70.990 TIME= 09:23:39
Element 4614 has a poor shape angle of 43.941945 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4615 has an angle between adjacent edges of 138.74 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4615 has a poor shape angle of 42.6574259 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4616 has an angle between adjacent edges of 138.38 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4616 has a poor shape angle of 42.9018905 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4617 has an angle between adjacent edges of 138.32 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4617 has a poor shape angle of 43.0910163 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4618 has an angle between adjacent edges of 136.79 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.000 TIME= 09:23:39
Element 4619 has an angle between adjacent edges of 136.45 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.010 TIME= 09:23:39
Element 4620 has an angle between adjacent edges of 136.36 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.010 TIME= 09:23:39
Element 4651 has an angle between adjacent edges of 39.74 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.010 TIME= 09:23:39
Element 4651 has a poor shape angle of 41.8134621 degrees.

*** WARNING *** CP= 71.010 TIME= 09:23:39
Element 4652 has an angle between adjacent edges of 40.03 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.010 TIME= 09:23:39
Element 4652 has a poor shape angle of 42.0486322 degrees.

*** WARNING *** CP= 71.020 TIME= 09:23:39
Element 4653 has an angle between adjacent edges of 40.14 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.020 TIME= 09:23:39
Element 4653 has a poor shape angle of 42.1139384 degrees.

*** WARNING *** CP= 71.020 TIME= 09:23:39
Element 4654 has an angle between adjacent edges of 39.15 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.020 TIME= 09:23:39
Element 4655 has an angle between adjacent edges of 39.50 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.020 TIME= 09:23:39
Element 4656 has an angle between adjacent edges of 40.01 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.030 TIME= 09:23:39
Element 4702 has an angle between adjacent edges of 136.60 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.030 TIME= 09:23:39
Element 4703 has an angle between adjacent edges of 136.41 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.030 TIME= 09:23:39
Element 4704 has an angle between adjacent edges of 136.12 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.030 TIME= 09:23:39
Element 4705 has an angle between adjacent edges of 147.02 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.030 TIME= 09:23:39
Element 4705 has a poor shape angle of 38.4601615 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4706 has an angle between adjacent edges of 146.24 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4706 has a poor shape angle of 38.7577285 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4707 has an angle between adjacent edges of 146.35 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4707 has a poor shape angle of 39.0508311 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4708 has an angle between adjacent edges of 142.18 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4708 has a poor shape angle of 36.3476955 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4709 has an angle between adjacent edges of 141.96 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4709 has a poor shape angle of 36.6610085 degrees.

*** WARNING *** CP= 71.040 TIME= 09:23:39
Element 4710 has an angle between adjacent edges of 142.04 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4710 has a poor shape angle of 36.6458189 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4711 has an angle between adjacent edges of 140.08 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4711 has a poor shape angle of 41.8760729 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4712 has an angle between adjacent edges of 139.65 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4712 has a poor shape angle of 42.0982805 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4713 has an angle between adjacent edges of 139.67 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.050 TIME= 09:23:39
Element 4713 has a poor shape angle of 42.1430371 degrees.

*** WARNING *** CP= 71.060 TIME= 09:23:39
Element 4756 has an angle between adjacent edges of 39.25 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.060 TIME= 09:23:39
Element 4756 has a poor shape angle of 41.8760748 degrees.

*** WARNING *** CP= 71.060 TIME= 09:23:39
Element 4757 has an angle between adjacent edges of 39.55 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.060 TIME= 09:23:39
Element 4757 has a poor shape angle of 42.0982823 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4758 has an angle between adjacent edges of 39.66 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4758 has a poor shape angle of 42.143039 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4759 has an angle between adjacent edges of 34.26 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4759 has a poor shape angle of 36.3476991 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4760 has an angle between adjacent edges of 34.64 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4760 has a poor shape angle of 36.6610121 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4761 has an angle between adjacent edges of 34.69 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4761 has a poor shape angle of 36.6458224 degrees.

*** WARNING *** CP= 71.070 TIME= 09:23:39
Element 4762 has an angle between adjacent edges of 33.89 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4762 has a poor shape angle of 38.4601667 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4763 has an angle between adjacent edges of 34.23 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4763 has a poor shape angle of 38.7577338 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4764 has an angle between adjacent edges of 34.68 which is
outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4764 has a poor shape angle of 39.0508365 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4765 has an angle between adjacent edges of 43.78 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4766 has an angle between adjacent edges of 136.41 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.080 TIME= 09:23:39
Element 4767 has an angle between adjacent edges of 136.12 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.090 TIME= 09:23:39
Element 4813 has an angle between adjacent edges of 141.55 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.100 TIME= 09:23:39
Element 4814 has an angle between adjacent edges of 140.76 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.100 TIME= 09:23:39
Element 4815 has an angle between adjacent edges of 141.55 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.100 TIME= 09:23:39
Element 4816 has an angle between adjacent edges of 136.55 which is outside the recommended range of 45 to 135 degrees.

*** WARNING *** CP= 71.100 TIME= 09:23:39
Element 4816 has a poor shape angle of 41.8134597 degrees.

Error messages discontinued after 200 messages were displayed.
More may exist. See (mpc40mxx.err) for suppressed messages.

*** NOTE *** CP= 71.450 TIME= 09:23:40
The model data was checked and warning messages were found.
Please review output or errors file (mpc40mxx.err) for these warning messages.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:23:40 JUN 26, 1996 CP= 71.460
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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= 72.150 TIME= 09:23:41
This load step will be a static (steady-state) step.

*** NOTE *** CP= 72.510 TIME= 09:23:41
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. . . . . 0.10000E-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 = 6221.4

CENTROID	MOM. OF INERTIA ABOUT ORIGIN	MOM. OF INERTIA ABOUT CENTROID
XC = 0.40695	IXX = 1411.	IXX = 1411.
YC = 0.69247E-11	IYY = 1427.	IYY = 396.3
ZC = 0.00000E+00	IZZ = 2838.	IZZ = 1808.
	IXY = -0.1045E-06	IXY = -0.8692E-07
	IYZ = 0.0000E+00	IYZ = 0.0000E+00
	IZX = 0.0000E+00	IZX = 0.0000E+00

*** MASS SUMMARY BY ELEMENT TYPE ***

TYPE	MASS
1	6221.35

Range of element maximum matrix coefficients in global coordinates
 Maximum= 517.858581 at element 972.
 Minimum= 9.524656837E-10 at element 7845.

*** ELEMENT MATRIX FORMULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6865	PLANE55	7.480	0.001
18	3	MATRIX50	0.370	0.123

Time at end of element matrix formulation CP= 86.19.

HT FLOW CONVERGENCE VALUE= 7349. CRITERION= 7.349

Estimated number of active DOF= 6869.

Maximum wavefront= 691.

Time at end of matrix triangularization CP= 163.09.

Equation solver maximum pivot= 1604.85465 at node 3170 TEMP.

Equation solver minimum pivot= 0.234552121 at node 6681 TEMP.

EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 328.6

HT FLOW CONVERGENCE VALUE= 610.2 CRITERION= 0.1634

EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -112.1

HT FLOW CONVERGENCE VALUE= 91.35 CRITERION= 0.2908

EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -26.72

HT FLOW CONVERGENCE VALUE= 24.70 CRITERION= 0.1843

EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.865

HT FLOW CONVERGENCE VALUE= 1.900 CRITERION= 0.1636

EQUIL ITER 5 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5161

HT FLOW CONVERGENCE VALUE= 0.3414 CRITERION= 0.1626

EQUIL ITER 6 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3929E-01

HT FLOW CONVERGENCE VALUE= 0.2516E-01 CRITERION= 0.1628 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 6

*** ELEMENT RESULT CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6865	PLANE55	7.690	0.001
18	3	MATRIX50	0.630	0.210

*** NODAL LOAD CALCULATION TIMES

TYPE	NUMBER	ENAME	TOTAL CP	AVE CP
1	6865	PLANE55	1.400	0.000
18	3	MATRIX50	0.000	0.000

*** LOAD STEP 1 SUBSTEP 1 COMPLETED. CUM ITER = 6
*** TIME = 0.100000E-05 TIME INC = 0.100000E-05

*** PROBLEM STATISTICS

ACTUAL NO. OF ACTIVE DEGREES OF FREEDOM = 6869
R.M.S. WAVEFRONT SIZE = 269.9

*** ANSYS BINARY FILE STATISTICS

BUFFER SIZE USED= 4096
4.938 MB WRITTEN ON ELEMENT MATRIX FILE: mpc40mxx.emat
3.078 MB WRITTEN ON ELEMENT SAVED DATA FILE: mpc40mxx.esav
12.609 MB WRITTEN ON TRIANGULARIZED MATRIX FILE: mpc40mxx.tri
0.016 MB WRITTEN ON SUBSTRUCTURE DOF SOLUTION FILE: mpc40mxx.dsub
3.734 MB WRITTEN ON RESULTS FILE: mpc40mxx.rth
Solve steady-state for initial conditions
with WP surface temperatures from repository
steady-state solution.

SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 7 TO 7 STEP 1

1 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

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

2 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

SELECT ALL NODES (INTERIOR TO LINE, AND AT KEYPOINTS)
RELATED TO SELECTED LINE SET.

147 NODES (OF 7016 DEFINED) SELECTED FROM
2 SELECTED LINES BY NSLL COMMAND.

DELETE SPECIFIED CONSTRAINT TEMP FOR SELECTED NODES
RANGE 1 TO 7016 BY 1

NUMBER OF SPECIFIED CONSTRAINTS DELETED= 147

ALL SELECT FOR ITEM=LINE COMPONENT=
IN RANGE 1 TO 691 STEP 1

687 LINES (OF 687 DEFINED) SELECTED BY LSEL COMMAND.

ALL SELECT FOR ITEM=NODE COMPONENT=
IN RANGE 1 TO 7016 STEP 1

7016 NODES (OF 7016 DEFINED) SELECTED BY NSEL COMMAND.

CONSTRAINT AT KEYPOINT 11
LOAD LABELS = TEMP
VALUES = 69.138 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 10

```

LOAD LABELS = TEMP
VALUES =      69.192      0.00000E+00      EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 9
LOAD LABELS = TEMP
VALUES =      69.254      0.00000E+00      EXPANSION KEY = 1

SELECT      FOR ITEM=MAT COMPONENT=
IN RANGE    14 TO      14 STEP      1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT      ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM
24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
4043.84011 0.000000000E+00 0.000000000E+00 0.000000000E+00

ALL SELECT  FOR ITEM=AREA COMPONENT=
IN RANGE    1 TO      302 STEP      1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT  FOR ITEM=ELEM COMPONENT=
IN RANGE    1 TO      7845 STEP      1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

DO NOT INCLUDE TRANSIENT EFFECTS FOR ALL DOFS THIS LOAD STEP

TIME= 0.20000E-05

USE AUTOMATIC TIME STEPPING THIS LOAD STEP

STEP BOUNDARY CONDITION KEY= 0

***** ANSYS SOLVE      COMMAND *****

TRANSFER SOLID MODEL BOUNDARY CONDITIONS TO FINITE ELEMENT MODEL
CONSTRAINTS      TRANSFERRED FROM KEYPOINTS      = 147

*** WARNING ***                      CP= 617.150  TIME= 09:33:07
This load step will be a static (steady-state) step.

*** NOTE ***                          CP= 617.510  TIME= 09:33:07
The step data was checked and warning messages were found.
Please review output or errors file ( mpc40mxx.err ) for these warning
messages.

*** NOTE ***                          CP= 617.510  TIME= 09:33:07
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.
1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303      VERSION=HP 9000/7XX 09:33:07 JUN 26, 1996 CP= 617.510
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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LOAD STEP OPTIONS

```

LOAD STEP NUMBER. . . . . 2
TIME AT END OF THE LOAD STEP. . . . . 0.20000E-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= 0.1216E+05 CRITERION= 12.16
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 43.28
 HT FLOW CONVERGENCE VALUE= 34.89 CRITERION= 0.1739
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -12.37
 HT FLOW CONVERGENCE VALUE= 8.289 CRITERION= 0.1691
 EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7669
 HT FLOW CONVERGENCE VALUE= 0.4484 CRITERION= 0.1629
 EQUIL ITER 4 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1317
 HT FLOW CONVERGENCE VALUE= 0.9075E-01 CRITERION= 0.1627 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 4
 *** LOAD STEP 2 SUBSTEP 1 COMPLETED. CUM ITER = 10
 *** TIME = 0.200000E-05 TIME INC = 0.100000E-05

Set time integration parameters

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

USE 10 SUBSTEPS INITIALLY THIS LOAD STEP FOR ALL DOFS
 FOR AUTOMATIC TIME STEPPING:

USE 40 SUBSTEPS AS A MAXIMUM
 USE 4 SUBSTEPS AS A MINIMUM
 USE THE FINAL TIME STEP SIZE OF THE PREVIOUS LOAD STEP
 AS THE STARTING TIME STEP SIZE.
 Begin Transient
 Apply loads and solve for 0 to .9 years

*DO LOOP ON PARAMETER= TM FROM 31.558 TO 0.28402E+08 BY 0.31558E+07

TIME= 31.558

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 14 TO 14 STEP 1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM
 24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
 4043.84011 0.000000000E+00 0.000000000E+00 0.000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 1 TO 302 STEP 1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
 IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

CONSTRAINT AT KEYPOINT 11

LOAD LABELS = TEMP
 VALUES = 69.138 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 10
LOAD LABELS = TEMP
VALUES = 69.192 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 9
LOAD LABELS = TEMP
VALUES = 69.254 0.00000E+00 EXPANSION KEY = 1

***** ANSYS SOLVE COMMAND *****

TRANSFER SOLID MODEL BOUNDARY CONDITIONS TO FINITE ELEMENT MODEL
CONSTRAINTS TRANSFERRED FROM KEYPOINTS = 147

*** NOTE *** CP= 738.280 TIME= 09:35:18
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:35:18 JUN 26, 1996 CP= 738.280
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

LOAD STEP OPTIONS

LOAD STEP NUMBER. 3
TIME AT END OF THE LOAD STEP. 31.558
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 10
MAXIMUM NUMBER OF SUBSTEPS 40
MINIMUM NUMBER OF SUBSTEPS 4
START WITH TIME STEP FROM PREVIOUS SUBSTEP YES
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS
THERMAL DOFS ON
TRANSIENT INTEGRATION PARAMETERS
THETA. 0.50000
OSCILLATION LIMIT CRITERION. 0.50000
TOLERANCE. 0.20000
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= 0.9075E-01 CRITERION= 0.1627
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1088E-03
HT FLOW CONVERGENCE VALUE= 0.5925E-05 CRITERION= 0.1628 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 3 SUBSTEP 1 COMPLETED. CUM ITER = 11
*** TIME = 0.788942 TIME INC = 0.788940
*** RESPONSE EIGENVALUE = 0.3728 OSCILLATION LIMIT = 0.2941
*** AUTO STEP TIME: NEXT TIME INC = 0.78894 UNCHANGED

HT FLOW CONVERGENCE VALUE= 0.1551 CRITERION= 0.1627
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1022E-03
HT FLOW CONVERGENCE VALUE= 0.1025E-04 CRITERION= 0.1628 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 3 SUBSTEP 2 COMPLETED. CUM ITER = 12
*** TIME = 1.57788 TIME INC = 0.788940
*** RESPONSE EIGENVALUE = 0.2249 OSCILLATION LIMIT = 0.1775
*** AUTO TIME STEP: NEXT TIME INC = 2.2227 INCREASED (FACTOR = 2.8174)

HT FLOW CONVERGENCE VALUE= 0.1340 CRITERION= 0.1627
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1341E-03

HT FLOW CONVERGENCE VALUE= 0.2242E-04 CRITERION= 0.1628 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 3 SUBSTEP 3 COMPLETED. CUM ITER = 13
 *** TIME = 3.80061 TIME INC = 2.22273
 *** RESPONSE EIGENVALUE = 0.1233 OSCILLATION LIMIT = 0.2741
 *** AUTO TIME STEP: NEXT TIME INC = 4.0545 INCREASED (FACTOR = 1.8241)

HT FLOW CONVERGENCE VALUE= 0.1092 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7481E-04
 HT FLOW CONVERGENCE VALUE= 0.2825E-04 CRITERION= 0.1628 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 3 SUBSTEP 4 COMPLETED. CUM ITER = 14
 *** TIME = 7.85508 TIME INC = 4.05447
 *** RESPONSE EIGENVALUE = 0.5268E-01 OSCILLATION LIMIT = 0.2136
 *** AUTO TIME STEP: NEXT TIME INC = 7.8894 INCREASED (FACTOR = 1.9459)

HT FLOW CONVERGENCE VALUE= 0.9595E-01 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6596E-04
 HT FLOW CONVERGENCE VALUE= 0.3585E-04 CRITERION= 0.1628 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 3 SUBSTEP 5 COMPLETED. CUM ITER = 15
 *** TIME = 15.7445 TIME INC = 7.88940
 *** RESPONSE EIGENVALUE = 0.1749E-01 OSCILLATION LIMIT = 0.1380
 *** AUTO STEP TIME: NEXT TIME INC = 7.8894 UNCHANGED

HT FLOW CONVERGENCE VALUE= 0.8997E-01 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5088E-04
 HT FLOW CONVERGENCE VALUE= 0.2556E-04 CRITERION= 0.1628 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 3 SUBSTEP 6 COMPLETED. CUM ITER = 16
 *** TIME = 23.6339 TIME INC = 7.88940
 *** RESPONSE EIGENVALUE = 0.8457E-02 OSCILLATION LIMIT = 0.6672E-01
 *** AUTO TIME STEP: NEXT TIME INC = 7.9237 INCREASED (FACTOR = 1.0044)

HT FLOW CONVERGENCE VALUE= 0.8654E-01 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4361E-04
 HT FLOW CONVERGENCE VALUE= 0.2188E-04 CRITERION= 0.1628 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 3 SUBSTEP 7 COMPLETED. CUM ITER = 17
 *** TIME = 31.5576 TIME INC = 7.92372
 *** RESPONSE EIGENVALUE = 0.5850E-02 OSCILLATION LIMIT = 0.4635E-01

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 09:41:24 JUN 26, 1996 CP= 1073.840
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 212.7 CRITERION= 0.2678
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7923
 HT FLOW CONVERGENCE VALUE= 0.4603 CRITERION= 0.1610
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9189E-01
 HT FLOW CONVERGENCE VALUE= 0.7112E-01 CRITERION= 0.1610 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 4 SUBSTEP 1 COMPLETED. CUM ITER = 19
 *** TIME = 78925.6 TIME INC = 78894.0
 *** RESPONSE EIGENVALUE = 0.1416E-05 OSCILLATION LIMIT = 0.1117
 *** AUTO STEP TIME: NEXT TIME INC = 78894. UNCHANGED

HT FLOW CONVERGENCE VALUE= 213.8 CRITERION= 0.2672
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7959
 HT FLOW CONVERGENCE VALUE= 0.5311 CRITERION= 0.1621
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9086E-01
 HT FLOW CONVERGENCE VALUE= 0.6880E-01 CRITERION= 0.1622 <<< CONVERGED

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HT FLOW CONVERGENCE VALUE= 1393. CRITERION= 1.402
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 5.150
HT FLOW CONVERGENCE VALUE= 3.558 CRITERION= 0.1619
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.018
HT FLOW CONVERGENCE VALUE= 0.6355 CRITERION= 0.1622
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6998E-01
HT FLOW CONVERGENCE VALUE= 0.2495E-01 CRITERION= 0.1618 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 4 SUBSTEP 8 COMPLETED. CUM ITER = 39
*** TIME = 0.315579E+07 TIME INC = 512811.
*** RESPONSE EIGENVALUE = 0.1789E-06 OSCILLATION LIMIT = 0.9176E-01

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***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 09:56:04 JUN 26, 1996 CP= 1807.670
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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HT FLOW CONVERGENCE VALUE= 320.2 CRITERION= 0.3587
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.289
HT FLOW CONVERGENCE VALUE= 1.030 CRITERION= 0.1623
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2615
HT FLOW CONVERGENCE VALUE= 0.1457 CRITERION= 0.1625 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 5 SUBSTEP 1 COMPLETED. CUM ITER = 41
*** TIME = 0.366860E+07 TIME INC = 512811.
*** RESPONSE EIGENVALUE = 0.1956E-06 OSCILLATION LIMIT = 0.1003
*** AUTO STEP TIME: NEXT TIME INC = 0.51281E+06 UNCHANGED

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HT FLOW CONVERGENCE VALUE= 320.4 CRITERION= 0.3591
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.103
HT FLOW CONVERGENCE VALUE= 0.7068 CRITERION= 0.1621
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2117
HT FLOW CONVERGENCE VALUE= 0.1446 CRITERION= 0.1621 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 5 SUBSTEP 2 COMPLETED. CUM ITER = 43
*** TIME = 0.418141E+07 TIME INC = 512811.
*** RESPONSE EIGENVALUE = 0.6959E-06 OSCILLATION LIMIT = 0.3569
*** AUTO STEP TIME: NEXT TIME INC = 0.51281E+06 UNCHANGED

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HT FLOW CONVERGENCE VALUE= 320.2 CRITERION= 0.3589
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.106
HT FLOW CONVERGENCE VALUE= 0.8881 CRITERION= 0.1621
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2404
HT FLOW CONVERGENCE VALUE= 0.1432 CRITERION= 0.1622 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 5 SUBSTEP 3 COMPLETED. CUM ITER = 45
*** TIME = 0.469422E+07 TIME INC = 512811.
*** RESPONSE EIGENVALUE = 0.1095E-06 OSCILLATION LIMIT = 0.5616E-01
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.5385)

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HT FLOW CONVERGENCE VALUE= 492.8 CRITERION= 0.5187
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.697
HT FLOW CONVERGENCE VALUE= 1.206 CRITERION= 0.1621
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3659
HT FLOW CONVERGENCE VALUE= 0.2307 CRITERION= 0.1621
EQUIL ITER 3 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2661E-01
HT FLOW CONVERGENCE VALUE= 0.9049E-02 CRITERION= 0.1619 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 3
*** LOAD STEP 5 SUBSTEP 4 COMPLETED. CUM ITER = 48
*** TIME = 0.548316E+07 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.2140E-06 OSCILLATION LIMIT = 0.1688
*** AUTO TIME STEP: NEXT TIME INC = 0.41419E+06 DECREASED (FACTOR = 0.5250)

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HT FLOW CONVERGENCE VALUE= 258.6 CRITERION= 0.3051

EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8931
 HT FLOW CONVERGENCE VALUE= 0.6858 CRITERION= 0.1619
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1814
 HT FLOW CONVERGENCE VALUE= 0.1103 CRITERION= 0.1620 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 5 SUBSTEP 5 COMPLETED. CUM ITER = 50
 *** TIME = 0.589736E+07 TIME INC = 414194.
 *** RESPONSE EIGENVALUE = 0.2113E-06 OSCILLATION LIMIT = 0.8754E-01
 *** AUTO STEP TIME: NEXT TIME INC = 0.41419E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 258.8 CRITERION= 0.3052
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8909
 HT FLOW CONVERGENCE VALUE= 0.6297 CRITERION= 0.1620
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1709
 HT FLOW CONVERGENCE VALUE= 0.1079 CRITERION= 0.1620 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 5 SUBSTEP 6 COMPLETED. CUM ITER = 52
 *** TIME = 0.631155E+07 TIME INC = 414194.
 *** RESPONSE EIGENVALUE = 0.1922E-06 OSCILLATION LIMIT = 0.7960E-01

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 10:04:44 JUN 26, 1996 CP= 2270.150
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 167.2 CRITERION= 0.2328
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5785
 HT FLOW CONVERGENCE VALUE= 0.4505 CRITERION= 0.1620
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1177
 HT FLOW CONVERGENCE VALUE= 0.7037E-01 CRITERION= 0.1621 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 6 SUBSTEP 1 COMPLETED. CUM ITER = 54
 *** TIME = 0.672575E+07 TIME INC = 414194.
 *** RESPONSE EIGENVALUE = 0.1530E-06 OSCILLATION LIMIT = 0.6339E-01
 *** AUTO STEP TIME: NEXT TIME INC = 0.41419E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 167.4 CRITERION= 0.2329
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5772
 HT FLOW CONVERGENCE VALUE= 0.3983 CRITERION= 0.1619
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1085
 HT FLOW CONVERGENCE VALUE= 0.6893E-01 CRITERION= 0.1619 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 6 SUBSTEP 2 COMPLETED. CUM ITER = 56
 *** TIME = 0.713994E+07 TIME INC = 414194.
 *** RESPONSE EIGENVALUE = 0.2142E-06 OSCILLATION LIMIT = 0.8872E-01
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.9048)

HT FLOW CONVERGENCE VALUE= 318.5 CRITERION= 0.3573
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.100
 HT FLOW CONVERGENCE VALUE= 0.8159 CRITERION= 0.1619
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2409
 HT FLOW CONVERGENCE VALUE= 0.1467 CRITERION= 0.1620 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 6 SUBSTEP 3 COMPLETED. CUM ITER = 58
 *** TIME = 0.792888E+07 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.2658E-06 OSCILLATION LIMIT = 0.2097
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 318.6 CRITERION= 0.3574
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.099
 HT FLOW CONVERGENCE VALUE= 0.7889 CRITERION= 0.1618
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2336
 HT FLOW CONVERGENCE VALUE= 0.1431 CRITERION= 0.1618 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 6 SUBSTEP 4 COMPLETED. CUM ITER = 60

*** TIME = 0.871782E+07 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1835E-06 OSCILLATION LIMIT = 0.1447
 *** AUTO TIME STEP: NEXT TIME INC = 0.74949E+06 DECREASED (FACTOR = 0.9500)

HT FLOW CONVERGENCE VALUE= 302.6 CRITERION= 0.3432
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 1.044
 HT FLOW CONVERGENCE VALUE= 0.7689 CRITERION= 0.1618
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2243
 HT FLOW CONVERGENCE VALUE= 0.1359 CRITERION= 0.1618 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 6 SUBSTEP 5 COMPLETED. CUM ITER = 62
 *** TIME = 0.946731E+07 TIME INC = 749493.
 *** RESPONSE EIGENVALUE = 0.2394E-06 OSCILLATION LIMIT = 0.1794

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 10:11:57 JUN 26, 1996 CP= 2637.900
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 232.4 CRITERION= 0.2831
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8020
 HT FLOW CONVERGENCE VALUE= 0.5799 CRITERION= 0.1618
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1685
 HT FLOW CONVERGENCE VALUE= 0.1020 CRITERION= 0.1618 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 7 SUBSTEP 1 COMPLETED. CUM ITER = 64
 *** TIME = 0.102168E+08 TIME INC = 749493.
 *** RESPONSE EIGENVALUE = 0.1382E-06 OSCILLATION LIMIT = 0.1036
 *** AUTO STEP TIME: NEXT TIME INC = 0.74949E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 232.2 CRITERION= 0.2830
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8020
 HT FLOW CONVERGENCE VALUE= 0.5784 CRITERION= 0.1616
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1696
 HT FLOW CONVERGENCE VALUE= 0.1034 CRITERION= 0.1616 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 7 SUBSTEP 2 COMPLETED. CUM ITER = 66
 *** TIME = 0.109663E+08 TIME INC = 749493.
 *** RESPONSE EIGENVALUE = 0.3152E-06 OSCILLATION LIMIT = 0.2362
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.0526)

HT FLOW CONVERGENCE VALUE= 244.6 CRITERION= 0.2931
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8442
 HT FLOW CONVERGENCE VALUE= 0.6070 CRITERION= 0.1616
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1773
 HT FLOW CONVERGENCE VALUE= 0.1071 CRITERION= 0.1616 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 7 SUBSTEP 3 COMPLETED. CUM ITER = 68
 *** TIME = 0.117552E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1673E-06 OSCILLATION LIMIT = 0.1320
 *** AUTO TIME STEP: NEXT TIME INC = 0.43392E+06 DECREASED (FACTOR = 0.5500)

HT FLOW CONVERGENCE VALUE= 134.4 CRITERION= 0.2102
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4643
 HT FLOW CONVERGENCE VALUE= 0.3326 CRITERION= 0.1614
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8923E-01
 HT FLOW CONVERGENCE VALUE= 0.5453E-01 CRITERION= 0.1615 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 7 SUBSTEP 4 COMPLETED. CUM ITER = 70
 *** TIME = 0.121892E+08 TIME INC = 433917.
 *** RESPONSE EIGENVALUE = 0.3040E-06 OSCILLATION LIMIT = 0.1319
 *** AUTO STEP TIME: NEXT TIME INC = 0.43392E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 134.6 CRITERION= 0.2102
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4643

HT FLOW CONVERGENCE VALUE= 0.3287 CRITERION= 0.1615
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8753E-01
 HT FLOW CONVERGENCE VALUE= 0.5321E-01 CRITERION= 0.1615 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 7 SUBSTEP 5 COMPLETED. CUM ITER = 72
 *** TIME = 0.126231E+08 TIME INC = 433917.
 *** RESPONSE EIGENVALUE = 0.1357E-06 OSCILLATION LIMIT = 0.5887E-01

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 10:18:59 JUN 26, 1996 CP= 3005.490
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 109.4 CRITERION= 0.1950
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3782
 HT FLOW CONVERGENCE VALUE= 0.2751 CRITERION= 0.1614
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7337E-01
 HT FLOW CONVERGENCE VALUE= 0.4441E-01 CRITERION= 0.1614 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 8 SUBSTEP 1 COMPLETED. CUM ITER = 74
 *** TIME = 0.130570E+08 TIME INC = 433917.
 *** RESPONSE EIGENVALUE = 0.3366E-06 OSCILLATION LIMIT = 0.1461
 *** AUTO STEP TIME: NEXT TIME INC = 0.43392E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 109.5 CRITERION= 0.1950
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3782
 HT FLOW CONVERGENCE VALUE= 0.2616 CRITERION= 0.1614
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7008E-01
 HT FLOW CONVERGENCE VALUE= 0.4299E-01 CRITERION= 0.1614 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 8 SUBSTEP 2 COMPLETED. CUM ITER = 76
 *** TIME = 0.134909E+08 TIME INC = 433917.
 *** RESPONSE EIGENVALUE = 0.1713E-06 OSCILLATION LIMIT = 0.7433E-01
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.8182)

HT FLOW CONVERGENCE VALUE= 198.9 CRITERION= 0.2561
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6876
 HT FLOW CONVERGENCE VALUE= 0.4953 CRITERION= 0.1613
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1449
 HT FLOW CONVERGENCE VALUE= 0.8737E-01 CRITERION= 0.1613 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 8 SUBSTEP 3 COMPLETED. CUM ITER = 78
 *** TIME = 0.142798E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3467E-06 OSCILLATION LIMIT = 0.2735
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 199.0 CRITERION= 0.2561
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6876
 HT FLOW CONVERGENCE VALUE= 0.4853 CRITERION= 0.1613
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1413
 HT FLOW CONVERGENCE VALUE= 0.8518E-01 CRITERION= 0.1613 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 8 SUBSTEP 4 COMPLETED. CUM ITER = 80
 *** TIME = 0.150688E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1973E-06 OSCILLATION LIMIT = 0.1557
 *** AUTO TIME STEP: NEXT TIME INC = 0.71005E+06 DECREASED (FACTOR = 0.9000)

HT FLOW CONVERGENCE VALUE= 179.0 CRITERION= 0.2409
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6189
 HT FLOW CONVERGENCE VALUE= 0.4443 CRITERION= 0.1612
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1276
 HT FLOW CONVERGENCE VALUE= 0.7665E-01 CRITERION= 0.1612 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 8 SUBSTEP 5 COMPLETED. CUM ITER = 82
 *** TIME = 0.157788E+08 TIME INC = 710046.

*** RESPONSE EIGENVALUE = 0.3114E-06 OSCILLATION LIMIT = 0.2211

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 10:26:04 JUN 26, 1996 CP= 3373.740
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 152.7 CRITERION= 0.2220
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5275
HT FLOW CONVERGENCE VALUE= 0.3724 CRITERION= 0.1612
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1065
HT FLOW CONVERGENCE VALUE= 0.6389E-01 CRITERION= 0.1612 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 9 SUBSTEP 1 COMPLETED. CUM ITER = 84
*** TIME = 0.164889E+08 TIME INC = 710046.
*** RESPONSE EIGENVALUE = 0.1707E-06 OSCILLATION LIMIT = 0.1212
*** AUTO STEP TIME: NEXT TIME INC = 0.71005E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 152.6 CRITERION= 0.2220
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5275
HT FLOW CONVERGENCE VALUE= 0.3725 CRITERION= 0.1610
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1077
HT FLOW CONVERGENCE VALUE= 0.6506E-01 CRITERION= 0.1610 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 9 SUBSTEP 2 COMPLETED. CUM ITER = 86
*** TIME = 0.171989E+08 TIME INC = 710046.
*** RESPONSE EIGENVALUE = 0.3784E-06 OSCILLATION LIMIT = 0.2687
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.1111)

HT FLOW CONVERGENCE VALUE= 169.7 CRITERION= 0.2339
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5861
HT FLOW CONVERGENCE VALUE= 0.4107 CRITERION= 0.1610
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1194
HT FLOW CONVERGENCE VALUE= 0.7155E-01 CRITERION= 0.1610 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 9 SUBSTEP 3 COMPLETED. CUM ITER = 88
*** TIME = 0.179879E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.2017E-06 OSCILLATION LIMIT = 0.1592
*** AUTO TIME STEP: NEXT TIME INC = 0.47336E+06 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 101.7 CRITERION= 0.1905
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3517
HT FLOW CONVERGENCE VALUE= 0.2465 CRITERION= 0.1609
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6710E-01
HT FLOW CONVERGENCE VALUE= 0.4061E-01 CRITERION= 0.1609 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 9 SUBSTEP 4 COMPLETED. CUM ITER = 90
*** TIME = 0.184612E+08 TIME INC = 473364.
*** RESPONSE EIGENVALUE = 0.3692E-06 OSCILLATION LIMIT = 0.1748
*** AUTO STEP TIME: NEXT TIME INC = 0.47336E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 101.9 CRITERION= 0.1904
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3517
HT FLOW CONVERGENCE VALUE= 0.2430 CRITERION= 0.1609
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6561E-01
HT FLOW CONVERGENCE VALUE= 0.3953E-01 CRITERION= 0.1609 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 9 SUBSTEP 5 COMPLETED. CUM ITER = 92
*** TIME = 0.189346E+08 TIME INC = 473364.
*** RESPONSE EIGENVALUE = 0.1693E-06 OSCILLATION LIMIT = 0.8012E-01

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 10:33:10 JUN 26, 1996 CP= 3741.600
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 88.37 CRITERION= 0.1836
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3061
HT FLOW CONVERGENCE VALUE= 0.2159 CRITERION= 0.1608
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5863E-01
HT FLOW CONVERGENCE VALUE= 0.3532E-01 CRITERION= 0.1608 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 10 SUBSTEP 1 COMPLETED. CUM ITER = 94
*** TIME = 0.194080E+08 TIME INC = 473364.
*** RESPONSE EIGENVALUE = 0.4094E-06 OSCILLATION LIMIT = 0.1938
*** AUTO STEP TIME: NEXT TIME INC = 0.47336E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 88.50 CRITERION= 0.1835
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3061
HT FLOW CONVERGENCE VALUE= 0.2080 CRITERION= 0.1608
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5633E-01
HT FLOW CONVERGENCE VALUE= 0.3416E-01 CRITERION= 0.1608 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 10 SUBSTEP 2 COMPLETED. CUM ITER = 96
*** TIME = 0.198813E+08 TIME INC = 473364.
*** RESPONSE EIGENVALUE = 0.2057E-06 OSCILLATION LIMIT = 0.9736E-01
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.6667)

HT FLOW CONVERGENCE VALUE= 147.3 CRITERION= 0.2181
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5102
HT FLOW CONVERGENCE VALUE= 0.3565 CRITERION= 0.1607
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1046
HT FLOW CONVERGENCE VALUE= 0.6269E-01 CRITERION= 0.1607 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 10 SUBSTEP 3 COMPLETED. CUM ITER = 98
*** TIME = 0.206703E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4011E-06 OSCILLATION LIMIT = 0.3165
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 147.4 CRITERION= 0.2180
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.5102
HT FLOW CONVERGENCE VALUE= 0.3469 CRITERION= 0.1607
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1022
HT FLOW CONVERGENCE VALUE= 0.6111E-01 CRITERION= 0.1607 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 10 SUBSTEP 4 COMPLETED. CUM ITER = 100
*** TIME = 0.214592E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.2334E-06 OSCILLATION LIMIT = 0.1841
*** AUTO TIME STEP: NEXT TIME INC = 0.63115E+06 DECREASED (FACTOR = 0.8000)

HT FLOW CONVERGENCE VALUE= 117.8 CRITERION= 0.1992
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4082
HT FLOW CONVERGENCE VALUE= 0.2817 CRITERION= 0.1605
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8086E-01
HT FLOW CONVERGENCE VALUE= 0.4834E-01 CRITERION= 0.1605 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 10 SUBSTEP 5 COMPLETED. CUM ITER = 102
*** TIME = 0.220904E+08 TIME INC = 631152.
*** RESPONSE EIGENVALUE = 0.3712E-06 OSCILLATION LIMIT = 0.2343

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 10:40:19 JUN 26, 1996 CP= 4111.390
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 101.9 CRITERION= 0.1901
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3504
 HT FLOW CONVERGENCE VALUE= 0.2427 CRITERION= 0.1606
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6838E-01
 HT FLOW CONVERGENCE VALUE= 0.4065E-01 CRITERION= 0.1606 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 11 SUBSTEP 1 COMPLETED. CUM ITER = 104
 *** TIME = 0.227215E+08 TIME INC = 631152.
 *** RESPONSE EIGENVALUE = 0.1751E-06 OSCILLATION LIMIT = 0.1105
 *** AUTO STEP TIME: NEXT TIME INC = 0.63115E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 101.7 CRITERION= 0.1901
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3504
 HT FLOW CONVERGENCE VALUE= 0.2445 CRITERION= 0.1604
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6954E-01
 HT FLOW CONVERGENCE VALUE= 0.4163E-01 CRITERION= 0.1604 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 11 SUBSTEP 2 COMPLETED. CUM ITER = 106
 *** TIME = 0.233527E+08 TIME INC = 631152.
 *** RESPONSE EIGENVALUE = 0.4086E-06 OSCILLATION LIMIT = 0.2579
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.2500)

HT FLOW CONVERGENCE VALUE= 127.3 CRITERION= 0.2048
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4381
 HT FLOW CONVERGENCE VALUE= 0.3042 CRITERION= 0.1604
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8799E-01
 HT FLOW CONVERGENCE VALUE= 0.5220E-01 CRITERION= 0.1604 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 11 SUBSTEP 3 COMPLETED. CUM ITER = 108
 *** TIME = 0.241416E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.2163E-06 OSCILLATION LIMIT = 0.1706
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 127.2 CRITERION= 0.2047
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4381
 HT FLOW CONVERGENCE VALUE= 0.3060 CRITERION= 0.1603
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8917E-01
 HT FLOW CONVERGENCE VALUE= 0.5297E-01 CRITERION= 0.1603 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 11 SUBSTEP 4 COMPLETED. CUM ITER = 110
 *** TIME = 0.249305E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3701E-06 OSCILLATION LIMIT = 0.2920
 *** AUTO TIME STEP: NEXT TIME INC = 0.31558E+06 DECREASED (FACTOR = 0.4000)

HT FLOW CONVERGENCE VALUE= 50.98 CRITERION= 0.1682
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1752
 HT FLOW CONVERGENCE VALUE= 0.1187 CRITERION= 0.1603 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 11 SUBSTEP 5 COMPLETED. CUM ITER = 111
 *** TIME = 0.252461E+08 TIME INC = 315576.
 *** RESPONSE EIGENVALUE = 0.1077E-06 OSCILLATION LIMIT = 0.3400E-01

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 10:47:09 JUN 26, 1996 CP= 4455.500
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 46.02 CRITERION= 0.1668
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1593
 HT FLOW CONVERGENCE VALUE= 0.1053 CRITERION= 0.1603 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 12 SUBSTEP 1 COMPLETED. CUM ITER = 112
 *** TIME = 0.255617E+08 TIME INC = 315576.
 *** RESPONSE EIGENVALUE = 0.4394E-06 OSCILLATION LIMIT = 0.1387
 *** AUTO STEP TIME: NEXT TIME INC = 0.31558E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 46.16 CRITERION= 0.1668
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1588
 HT FLOW CONVERGENCE VALUE= 0.9523E-01 CRITERION= 0.1603 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 12 SUBSTEP 2 COMPLETED. CUM ITER = 113
 *** TIME = 0.258773E+08 TIME INC = 315576.
 *** RESPONSE EIGENVALUE = 0.3774E-06 OSCILLATION LIMIT = 0.1191
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 2.5000)

HT FLOW CONVERGENCE VALUE= 115.1 CRITERION= 0.1973
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3968
 HT FLOW CONVERGENCE VALUE= 0.2634 CRITERION= 0.1602
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7814E-01
 HT FLOW CONVERGENCE VALUE= 0.4768E-01 CRITERION= 0.1602 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 12 SUBSTEP 3 COMPLETED. CUM ITER = 115
 *** TIME = 0.266662E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.5755E-06 OSCILLATION LIMIT = 0.4540
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 115.2 CRITERION= 0.1973
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3968
 HT FLOW CONVERGENCE VALUE= 0.2657 CRITERION= 0.1601
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7774E-01
 HT FLOW CONVERGENCE VALUE= 0.4658E-01 CRITERION= 0.1601 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 12 SUBSTEP 4 COMPLETED. CUM ITER = 117
 *** TIME = 0.274551E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3306E-06 OSCILLATION LIMIT = 0.2609
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+06 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 69.05 CRITERION= 0.1744
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2381
 HT FLOW CONVERGENCE VALUE= 0.1652 CRITERION= 0.1600
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4470E-01
 HT FLOW CONVERGENCE VALUE= 0.2647E-01 CRITERION= 0.1600 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 12 SUBSTEP 5 COMPLETED. CUM ITER = 119
 *** TIME = 0.279285E+08 TIME INC = 473364.
 *** RESPONSE EIGENVALUE = 0.3863E-06 OSCILLATION LIMIT = 0.1829
 *** AUTO STEP TIME: NEXT TIME INC = 0.47336E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 69.18 CRITERION= 0.1743
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2381
 HT FLOW CONVERGENCE VALUE= 0.1584 CRITERION= 0.1600 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 12 SUBSTEP 6 COMPLETED. CUM ITER = 120
 *** TIME = 0.284019E+08 TIME INC = 473364.
 *** RESPONSE EIGENVALUE = 0.1363E-06 OSCILLATION LIMIT = 0.6450E-01
 Apply loads and solve for 1 to 9 years

*DO LOOP ON PARAMETER= TM FROM 0.31558E+08 TO 0.28402E+09 BY 0.31558E+08

TIME= 0.31558E+08

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 14 TO 14 STEP 1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM
 24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
 3966.31728 0.00000000E+00 0.00000000E+00 0.00000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=

IN RANGE 1 TO 302 STEP 1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

CONSTRAINT AT KEYPOINT 11

LOAD LABELS = TEMP

VALUES = 123.63 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 10

LOAD LABELS = TEMP

VALUES = 124.68 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 9

LOAD LABELS = TEMP

VALUES = 127.28 0.00000E+00 EXPANSION KEY = 1

***** ANSYS SOLVE COMMAND *****

TRANSFER SOLID MODEL BOUNDARY CONDITIONS TO FINITE ELEMENT MODEL
CONSTRAINTS TRANSFERRED FROM KEYPOINTS = 147

*** NOTE *** CP= 4821.220 TIME= 10:54:04
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 10:54:04 JUN 26, 1996 CP= 4821.220
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

LOAD STEP OPTIONS

LOAD STEP NUMBER. 13
TIME AT END OF THE LOAD STEP. 0.31558E+08
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 10
MAXIMUM NUMBER OF SUBSTEPS 40
MINIMUM NUMBER OF SUBSTEPS 4
START WITH TIME STEP FROM PREVIOUS SUBSTEP . YES
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. . . . 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS
THERMAL DOFS ON
TRANSIENT INTEGRATION PARAMETERS
THETA. 0.50000
OSCILLATION LIMIT CRITERION. 0.50000
TOLERANCE. 0.20000
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= 64.00 CRITERION= 0.1723
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2213
HT FLOW CONVERGENCE VALUE= 0.1426 CRITERION= 0.1600 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 13 SUBSTEP 1 COMPLETED. CUM ITER = 121
*** TIME = 0.288752E+08 TIME INC = 473364.
*** RESPONSE EIGENVALUE = 0.3921E-06 OSCILLATION LIMIT = 0.1856
*** AUTO STEP TIME: NEXT TIME INC = 0.47336E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 64.13 CRITERION= 0.1723
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2210
 HT FLOW CONVERGENCE VALUE= 0.1315 CRITERION= 0.1600 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 13 SUBSTEP 2 COMPLETED. CUM ITER = 122
 *** TIME = 0.293486E+08 TIME INC = 473364.
 *** RESPONSE EIGENVALUE = 0.4407E-06 OSCILLATION LIMIT = 0.2086
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 INCREASED (FACTOR = 1.6667)

HT FLOW CONVERGENCE VALUE= 106.7 CRITERION= 0.1923
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3683
 HT FLOW CONVERGENCE VALUE= 0.2383 CRITERION= 0.1599
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7096E-01
 HT FLOW CONVERGENCE VALUE= 0.4344E-01 CRITERION= 0.1598 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 13 SUBSTEP 3 COMPLETED. CUM ITER = 124
 *** TIME = 0.301375E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6176E-06 OSCILLATION LIMIT = 0.4873
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 106.8 CRITERION= 0.1922
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3683
 HT FLOW CONVERGENCE VALUE= 0.2417 CRITERION= 0.1598
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7102E-01
 HT FLOW CONVERGENCE VALUE= 0.4258E-01 CRITERION= 0.1598 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 13 SUBSTEP 4 COMPLETED. CUM ITER = 126
 *** TIME = 0.309265E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3916E-06 OSCILLATION LIMIT = 0.3089
 *** AUTO TIME STEP: NEXT TIME INC = 0.63115E+06 DECREASED (FACTOR = 0.8000)

HT FLOW CONVERGENCE VALUE= 85.34 CRITERION= 0.1811
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2947
 HT FLOW CONVERGENCE VALUE= 0.2032 CRITERION= 0.1597
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5751E-01
 HT FLOW CONVERGENCE VALUE= 0.3366E-01 CRITERION= 0.1597 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 13 SUBSTEP 5 COMPLETED. CUM ITER = 128
 *** TIME = 0.315576E+08 TIME INC = 631152.
 *** RESPONSE EIGENVALUE = 0.3769E-06 OSCILLATION LIMIT = 0.2379

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 11:00:00 JUN 26, 1996 CP= 5138.700
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 76.14 CRITERION= 0.1769
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2631
 HT FLOW CONVERGENCE VALUE= 0.1725 CRITERION= 0.1597
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5059E-01
 HT FLOW CONVERGENCE VALUE= 0.3011E-01 CRITERION= 0.1597 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 1 COMPLETED. CUM ITER = 130
 *** TIME = 0.323466E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3540E-06 OSCILLATION LIMIT = 0.2793
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 76.00 CRITERION= 0.1768
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2631
 HT FLOW CONVERGENCE VALUE= 0.1741 CRITERION= 0.1595
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5164E-01
 HT FLOW CONVERGENCE VALUE= 0.3081E-01 CRITERION= 0.1595 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 2 COMPLETED. CUM ITER = 132
*** TIME = 0.331355E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.6108E-06 OSCILLATION LIMIT = 0.4819
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 76.14 CRITERION= 0.1767
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2631
HT FLOW CONVERGENCE VALUE= 0.1719 CRITERION= 0.1595
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5047E-01
HT FLOW CONVERGENCE VALUE= 0.3000E-01 CRITERION= 0.1595 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 3 COMPLETED. CUM ITER = 134
*** TIME = 0.339245E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.3660E-06 OSCILLATION LIMIT = 0.2888
*** AUTO TIME STEP: NEXT TIME INC = 0.13660E+07 INCREASED (FACTOR = 1.7315)

HT FLOW CONVERGENCE VALUE= 131.6 CRITERION= 0.2068
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4555
HT FLOW CONVERGENCE VALUE= 0.3010 CRITERION= 0.1593
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9379E-01
HT FLOW CONVERGENCE VALUE= 0.5549E-01 CRITERION= 0.1593 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 4 COMPLETED. CUM ITER = 136
*** TIME = 0.352905E+08 TIME INC = 0.136604E+07
*** RESPONSE EIGENVALUE = 0.5741E-06 OSCILLATION LIMIT = 0.7843
*** AUTO TIME STEP: NEXT TIME INC = 0.87091E+06 DECREASED (FACTOR = 0.6375)

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1801
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
HT FLOW CONVERGENCE VALUE= 0.1892 CRITERION= 0.1593
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5611E-01
HT FLOW CONVERGENCE VALUE= 0.3313E-01 CRITERION= 0.1593 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 5 COMPLETED. CUM ITER = 138
*** TIME = 0.361614E+08 TIME INC = 870908.
*** RESPONSE EIGENVALUE = 0.3480E-06 OSCILLATION LIMIT = 0.3031
*** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1801
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
HT FLOW CONVERGENCE VALUE= 0.1911 CRITERION= 0.1592
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5730E-01
HT FLOW CONVERGENCE VALUE= 0.3387E-01 CRITERION= 0.1592 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 6 COMPLETED. CUM ITER = 140
*** TIME = 0.370323E+08 TIME INC = 870908.
*** RESPONSE EIGENVALUE = 0.5744E-06 OSCILLATION LIMIT = 0.5003
*** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1800
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
HT FLOW CONVERGENCE VALUE= 0.1886 CRITERION= 0.1592
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5608E-01
HT FLOW CONVERGENCE VALUE= 0.3308E-01 CRITERION= 0.1592 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 7 COMPLETED. CUM ITER = 142
*** TIME = 0.379032E+08 TIME INC = 870908.
*** RESPONSE EIGENVALUE = 0.3839E-06 OSCILLATION LIMIT = 0.3343
*** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1799
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
HT FLOW CONVERGENCE VALUE= 0.1904 CRITERION= 0.1590
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5712E-01
HT FLOW CONVERGENCE VALUE= 0.3368E-01 CRITERION= 0.1590 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 14 SUBSTEP 8 COMPLETED. CUM ITER = 144
*** TIME = 0.387741E+08 TIME INC = 870908.
*** RESPONSE EIGENVALUE = 0.5705E-06 OSCILLATION LIMIT = 0.4969

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*** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1798
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1880 CRITERION= 0.1590
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5596E-01
 HT FLOW CONVERGENCE VALUE= 0.3291E-01 CRITERION= 0.1590 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 9 COMPLETED. CUM ITER = 146
 *** TIME = 0.396450E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3851E-06 OSCILLATION LIMIT = 0.3354
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1798
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1898 CRITERION= 0.1588
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5696E-01
 HT FLOW CONVERGENCE VALUE= 0.3349E-01 CRITERION= 0.1588 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 10 COMPLETED. CUM ITER = 148
 *** TIME = 0.405159E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5668E-06 OSCILLATION LIMIT = 0.4936
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1797
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1875 CRITERION= 0.1588
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5583E-01
 HT FLOW CONVERGENCE VALUE= 0.3275E-01 CRITERION= 0.1588 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 11 COMPLETED. CUM ITER = 150
 *** TIME = 0.413868E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3865E-06 OSCILLATION LIMIT = 0.3366
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1796
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1891 CRITERION= 0.1587
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5680E-01
 HT FLOW CONVERGENCE VALUE= 0.3329E-01 CRITERION= 0.1587 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 12 COMPLETED. CUM ITER = 152
 *** TIME = 0.422578E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5632E-06 OSCILLATION LIMIT = 0.4905
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1795
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1869 CRITERION= 0.1587
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5570E-01
 HT FLOW CONVERGENCE VALUE= 0.3255E-01 CRITERION= 0.1587 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 13 COMPLETED. CUM ITER = 154
 *** TIME = 0.431287E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3879E-06 OSCILLATION LIMIT = 0.3379
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1795
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1884 CRITERION= 0.1585
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5663E-01
 HT FLOW CONVERGENCE VALUE= 0.3307E-01 CRITERION= 0.1585 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 14 COMPLETED. CUM ITER = 156
 *** TIME = 0.439996E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5592E-06 OSCILLATION LIMIT = 0.4870
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1794
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904

HT FLOW CONVERGENCE VALUE= 0.1861 CRITERION= 0.1585
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5556E-01
 HT FLOW CONVERGENCE VALUE= 0.3238E-01 CRITERION= 0.1585 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 15 COMPLETED. CUM ITER = 158
 *** TIME = 0.448705E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3892E-06 OSCILLATION LIMIT = 0.3390
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1793
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1874 CRITERION= 0.1583
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5646E-01
 HT FLOW CONVERGENCE VALUE= 0.3287E-01 CRITERION= 0.1583 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 16 COMPLETED. CUM ITER = 160
 *** TIME = 0.457414E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5554E-06 OSCILLATION LIMIT = 0.4837
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1792
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1852 CRITERION= 0.1583
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5542E-01
 HT FLOW CONVERGENCE VALUE= 0.3218E-01 CRITERION= 0.1583 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 17 COMPLETED. CUM ITER = 162
 *** TIME = 0.466123E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3905E-06 OSCILLATION LIMIT = 0.3401
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1792
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1865 CRITERION= 0.1582
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5628E-01
 HT FLOW CONVERGENCE VALUE= 0.3268E-01 CRITERION= 0.1582 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 18 COMPLETED. CUM ITER = 164
 *** TIME = 0.474832E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5516E-06 OSCILLATION LIMIT = 0.4804
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1791
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1843 CRITERION= 0.1582
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5527E-01
 HT FLOW CONVERGENCE VALUE= 0.3201E-01 CRITERION= 0.1582 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 19 COMPLETED. CUM ITER = 166
 *** TIME = 0.483541E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3917E-06 OSCILLATION LIMIT = 0.3411
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1790
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1853 CRITERION= 0.1580
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5610E-01
 HT FLOW CONVERGENCE VALUE= 0.3247E-01 CRITERION= 0.1580 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 20 COMPLETED. CUM ITER = 168
 *** TIME = 0.492250E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5479E-06 OSCILLATION LIMIT = 0.4772
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1789
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1833 CRITERION= 0.1580
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5513E-01
 HT FLOW CONVERGENCE VALUE= 0.3181E-01 CRITERION= 0.1580 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 21 COMPLETED. CUM ITER = 170
 *** TIME = 0.500959E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3928E-06 OSCILLATION LIMIT = 0.3421
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1789
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1845 CRITERION= 0.1578
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5593E-01
 HT FLOW CONVERGENCE VALUE= 0.3226E-01 CRITERION= 0.1578 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 22 COMPLETED. CUM ITER = 172
 *** TIME = 0.509668E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5443E-06 OSCILLATION LIMIT = 0.4740
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1788
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1826 CRITERION= 0.1578
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5499E-01
 HT FLOW CONVERGENCE VALUE= 0.3162E-01 CRITERION= 0.1578 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 23 COMPLETED. CUM ITER = 174
 *** TIME = 0.518377E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3939E-06 OSCILLATION LIMIT = 0.3430
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1787
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1836 CRITERION= 0.1577
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5577E-01
 HT FLOW CONVERGENCE VALUE= 0.3206E-01 CRITERION= 0.1577 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 24 COMPLETED. CUM ITER = 176
 *** TIME = 0.527087E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5408E-06 OSCILLATION LIMIT = 0.4710
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1786
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1817 CRITERION= 0.1577
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5485E-01
 HT FLOW CONVERGENCE VALUE= 0.3144E-01 CRITERION= 0.1577 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 25 COMPLETED. CUM ITER = 178
 *** TIME = 0.535796E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3949E-06 OSCILLATION LIMIT = 0.3439
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1786
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1826 CRITERION= 0.1575
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5560E-01
 HT FLOW CONVERGENCE VALUE= 0.3186E-01 CRITERION= 0.1575 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 26 COMPLETED. CUM ITER = 180
 *** TIME = 0.544505E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5373E-06 OSCILLATION LIMIT = 0.4680
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1785
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1810 CRITERION= 0.1575
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5471E-01
 HT FLOW CONVERGENCE VALUE= 0.3126E-01 CRITERION= 0.1575 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 14 SUBSTEP 27 COMPLETED. CUM ITER = 182
 *** TIME = 0.553214E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3958E-06 OSCILLATION LIMIT = 0.3447
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1785
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1819 CRITERION= 0.1573
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5545E-01
 HT FLOW CONVERGENCE VALUE= 0.3166E-01 CRITERION= 0.1573 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 28 COMPLETED. CUM ITER = 184
 *** TIME = 0.561923E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5339E-06 OSCILLATION LIMIT = 0.4650
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1784
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1802 CRITERION= 0.1573
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5458E-01
 HT FLOW CONVERGENCE VALUE= 0.3107E-01 CRITERION= 0.1573 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 29 COMPLETED. CUM ITER = 186
 *** TIME = 0.570632E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3966E-06 OSCILLATION LIMIT = 0.3454
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1783
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1811 CRITERION= 0.1572
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5528E-01
 HT FLOW CONVERGENCE VALUE= 0.3146E-01 CRITERION= 0.1572 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 30 COMPLETED. CUM ITER = 188
 *** TIME = 0.579341E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5306E-06 OSCILLATION LIMIT = 0.4621
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1782
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1795 CRITERION= 0.1572
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5443E-01
 HT FLOW CONVERGENCE VALUE= 0.3089E-01 CRITERION= 0.1572 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 31 COMPLETED. CUM ITER = 190
 *** TIME = 0.588050E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3974E-06 OSCILLATION LIMIT = 0.3461
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1782
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1803 CRITERION= 0.1570
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5512E-01
 HT FLOW CONVERGENCE VALUE= 0.3126E-01 CRITERION= 0.1570 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 32 COMPLETED. CUM ITER = 192
 *** TIME = 0.596759E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5274E-06 OSCILLATION LIMIT = 0.4593
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1781
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1786 CRITERION= 0.1570
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5430E-01
 HT FLOW CONVERGENCE VALUE= 0.3072E-01 CRITERION= 0.1570 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 33 COMPLETED. CUM ITER = 194
 *** TIME = 0.605468E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3982E-06 OSCILLATION LIMIT = 0.3468
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.90 CRITERION= 0.1780
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1793 CRITERION= 0.1568

EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5496E-01
 HT FLOW CONVERGENCE VALUE= 0.3109E-01 CRITERION= 0.1568 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 34 COMPLETED. CUM ITER = 196
 *** TIME = 0.614177E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.5243E-06 OSCILLATION LIMIT = 0.4566
 *** AUTO STEP TIME: NEXT TIME INC = 0.87091E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 84.05 CRITERION= 0.1779
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2904
 HT FLOW CONVERGENCE VALUE= 0.1778 CRITERION= 0.1568
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5417E-01
 HT FLOW CONVERGENCE VALUE= 0.3055E-01 CRITERION= 0.1568 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 35 COMPLETED. CUM ITER = 198
 *** TIME = 0.622887E+08 TIME INC = 870908.
 *** RESPONSE EIGENVALUE = 0.3988E-06 OSCILLATION LIMIT = 0.3473
 *** AUTO TIME STEP: NEXT TIME INC = 0.82658E+06 DECREASED (FACTOR = 0.9491)

HT FLOW CONVERGENCE VALUE= 79.62 CRITERION= 0.1759
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2756
 HT FLOW CONVERGENCE VALUE= 0.1692 CRITERION= 0.1567
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5172E-01
 HT FLOW CONVERGENCE VALUE= 0.2918E-01 CRITERION= 0.1567 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 14 SUBSTEP 36 COMPLETED. CUM ITER = 200
 *** TIME = 0.631152E+08 TIME INC = 826581.
 *** RESPONSE EIGENVALUE = 0.5218E-06 OSCILLATION LIMIT = 0.4313

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 11:51:45 JUN 26, 1996 CP= 7772.260
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 52.43 CRITERION= 0.1652
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1815
 HT FLOW CONVERGENCE VALUE= 0.1089 CRITERION= 0.1567 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 1 COMPLETED. CUM ITER = 201
 *** TIME = 0.639418E+08 TIME INC = 826581.
 *** RESPONSE EIGENVALUE = 0.2258E-06 OSCILLATION LIMIT = 0.1866
 *** AUTO STEP TIME: NEXT TIME INC = 0.82658E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 52.27 CRITERION= 0.1652
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1814
 HT FLOW CONVERGENCE VALUE= 0.9869E-01 CRITERION= 0.1566 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 2 COMPLETED. CUM ITER = 202
 *** TIME = 0.647684E+08 TIME INC = 826581.
 *** RESPONSE EIGENVALUE = 0.9029E-06 OSCILLATION LIMIT = 0.7464
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+06 DECREASED (FACTOR = 0.9545)

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1643
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9266E-01 CRITERION= 0.1566 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 3 COMPLETED. CUM ITER = 203
 *** TIME = 0.655573E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6810E-06 OSCILLATION LIMIT = 0.5373
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1643
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9376E-01 CRITERION= 0.1564 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 4 COMPLETED. CUM ITER = 204
 *** TIME = 0.663463E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8121E-06 OSCILLATION LIMIT = 0.6407
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1642
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9306E-01 CRITERION= 0.1564 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 5 COMPLETED. CUM ITER = 205
 *** TIME = 0.671352E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6388E-06 OSCILLATION LIMIT = 0.5040
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1642
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9342E-01 CRITERION= 0.1563 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 6 COMPLETED. CUM ITER = 206
 *** TIME = 0.679242E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8262E-06 OSCILLATION LIMIT = 0.6518
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1641
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9288E-01 CRITERION= 0.1563 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 7 COMPLETED. CUM ITER = 207
 *** TIME = 0.687131E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6325E-06 OSCILLATION LIMIT = 0.4990
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1641
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9306E-01 CRITERION= 0.1561 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 8 COMPLETED. CUM ITER = 208
 *** TIME = 0.695020E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8281E-06 OSCILLATION LIMIT = 0.6533
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1639
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9267E-01 CRITERION= 0.1561 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 9 COMPLETED. CUM ITER = 209
 *** TIME = 0.702910E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6298E-06 OSCILLATION LIMIT = 0.4969
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1639
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9287E-01 CRITERION= 0.1560 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 10 COMPLETED. CUM ITER = 210
 *** TIME = 0.710799E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8270E-06 OSCILLATION LIMIT = 0.6525
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1638
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9258E-01 CRITERION= 0.1560 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 15 SUBSTEP 11 COMPLETED. CUM ITER = 211
 *** TIME = 0.718689E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6290E-06 OSCILLATION LIMIT = 0.4962
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1638
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732

HT FLOW CONVERGENCE VALUE= 0.9273E-01 CRITERION= 0.1558 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 12 COMPLETED. CUM ITER = 212
 *** TIME = 0.726578E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8244E-06 OSCILLATION LIMIT = 0.6504
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1636
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9249E-01 CRITERION= 0.1558 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 13 COMPLETED. CUM ITER = 213
 *** TIME = 0.734467E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6292E-06 OSCILLATION LIMIT = 0.4964
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1636
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9262E-01 CRITERION= 0.1557 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 14 COMPLETED. CUM ITER = 214
 *** TIME = 0.742357E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8209E-06 OSCILLATION LIMIT = 0.6477
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1635
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9239E-01 CRITERION= 0.1557 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 15 COMPLETED. CUM ITER = 215
 *** TIME = 0.750246E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6299E-06 OSCILLATION LIMIT = 0.4969
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1635
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9251E-01 CRITERION= 0.1555 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 16 COMPLETED. CUM ITER = 216
 *** TIME = 0.758136E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8171E-06 OSCILLATION LIMIT = 0.6446
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1634
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9230E-01 CRITERION= 0.1555 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 17 COMPLETED. CUM ITER = 217
 *** TIME = 0.766025E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6308E-06 OSCILLATION LIMIT = 0.4977
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1634
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9240E-01 CRITERION= 0.1554 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 18 COMPLETED. CUM ITER = 218
 *** TIME = 0.773914E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8131E-06 OSCILLATION LIMIT = 0.6415
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1632
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9221E-01 CRITERION= 0.1554 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 19 COMPLETED. CUM ITER = 219
 *** TIME = 0.781804E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6318E-06 OSCILLATION LIMIT = 0.4985
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1632
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9229E-01 CRITERION= 0.1552 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 20 COMPLETED. CUM ITER = 220
 *** TIME = 0.789693E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8091E-06 OSCILLATION LIMIT = 0.6383
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1631
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9211E-01 CRITERION= 0.1553 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 21 COMPLETED. CUM ITER = 221
 *** TIME = 0.797583E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6328E-06 OSCILLATION LIMIT = 0.4993
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1631
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9219E-01 CRITERION= 0.1551 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 22 COMPLETED. CUM ITER = 222
 *** TIME = 0.805472E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8051E-06 OSCILLATION LIMIT = 0.6352
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1629
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9202E-01 CRITERION= 0.1551 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 23 COMPLETED. CUM ITER = 223
 *** TIME = 0.813361E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6338E-06 OSCILLATION LIMIT = 0.5000
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1629
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9209E-01 CRITERION= 0.1549 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 24 COMPLETED. CUM ITER = 224
 *** TIME = 0.821251E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8011E-06 OSCILLATION LIMIT = 0.6321
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1628
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9193E-01 CRITERION= 0.1550 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 25 COMPLETED. CUM ITER = 225
 *** TIME = 0.829140E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6348E-06 OSCILLATION LIMIT = 0.5008
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1628
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9199E-01 CRITERION= 0.1548 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 26 COMPLETED. CUM ITER = 226
 *** TIME = 0.837030E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.7973E-06 OSCILLATION LIMIT = 0.6290
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9183E-01 CRITERION= 0.1548 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 27 COMPLETED. CUM ITER = 227
 *** TIME = 0.844919E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6356E-06 OSCILLATION LIMIT = 0.5015

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1627
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9189E-01 CRITERION= 0.1546 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 28 COMPLETED. CUM ITER = 228
 *** TIME = 0.852808E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.7934E-06 OSCILLATION LIMIT = 0.6260
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1625
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9174E-01 CRITERION= 0.1547 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 29 COMPLETED. CUM ITER = 229
 *** TIME = 0.860698E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6364E-06 OSCILLATION LIMIT = 0.5021
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1625
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9179E-01 CRITERION= 0.1545 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 30 COMPLETED. CUM ITER = 230
 *** TIME = 0.868587E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.7897E-06 OSCILLATION LIMIT = 0.6230
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1624
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9164E-01 CRITERION= 0.1545 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 31 COMPLETED. CUM ITER = 231
 *** TIME = 0.876477E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6372E-06 OSCILLATION LIMIT = 0.5027
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1624
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9169E-01 CRITERION= 0.1544 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 32 COMPLETED. CUM ITER = 232
 *** TIME = 0.884366E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.7861E-06 OSCILLATION LIMIT = 0.6202
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1622
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9154E-01 CRITERION= 0.1544 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 33 COMPLETED. CUM ITER = 233
 *** TIME = 0.892255E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.6379E-06 OSCILLATION LIMIT = 0.5032
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89 CRITERION= 0.1622
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9158E-01 CRITERION= 0.1542 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 34 COMPLETED. CUM ITER = 234
 *** TIME = 0.900145E+08 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.7825E-06 OSCILLATION LIMIT = 0.6173
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05 CRITERION= 0.1621
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
 HT FLOW CONVERGENCE VALUE= 0.9142E-01 CRITERION= 0.1542 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 15 SUBSTEP 35 COMPLETED. CUM ITER = 235

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*** TIME = 0.908034E+08    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.6385E-06    OSCILLATION LIMIT = 0.5037
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89    CRITERION= 0.1621
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
HT FLOW CONVERGENCE VALUE= 0.9144E-01    CRITERION= 0.1541    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 15 SUBSTEP 36 COMPLETED. CUM ITER = 236
*** TIME = 0.915924E+08    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.7790E-06    OSCILLATION LIMIT = 0.6146
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

HT FLOW CONVERGENCE VALUE= 50.05    CRITERION= 0.1620
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
HT FLOW CONVERGENCE VALUE= 0.9130E-01    CRITERION= 0.1541    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 15 SUBSTEP 37 COMPLETED. CUM ITER = 237
*** TIME = 0.923813E+08    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.6390E-06    OSCILLATION LIMIT = 0.5042
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

HT FLOW CONVERGENCE VALUE= 49.89    CRITERION= 0.1620
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1732
HT FLOW CONVERGENCE VALUE= 0.9130E-01    CRITERION= 0.1539    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 15 SUBSTEP 38 COMPLETED. CUM ITER = 238
*** TIME = 0.931702E+08    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.7755E-06    OSCILLATION LIMIT = 0.6119
*** AUTO STEP TIME: NEXT TIME INC = 0.75130E+06    DECREASED (FACTOR = 0.9523)

HT FLOW CONVERGENCE VALUE= 47.66    CRITERION= 0.1611
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1650
HT FLOW CONVERGENCE VALUE= 0.8652E-01    CRITERION= 0.1539    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 15 SUBSTEP 39 COMPLETED. CUM ITER = 239
*** TIME = 0.939215E+08    TIME INC = 751299.
*** RESPONSE EIGENVALUE = 0.6549E-06    OSCILLATION LIMIT = 0.4921
*** AUTO STEP TIME: NEXT TIME INC = 0.75130E+06    UNCHANGED

HT FLOW CONVERGENCE VALUE= 47.51    CRITERION= 0.1611
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1649
HT FLOW CONVERGENCE VALUE= 0.8675E-01    CRITERION= 0.1538    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 15 SUBSTEP 40 COMPLETED. CUM ITER = 240
*** TIME = 0.946728E+08    TIME INC = 751299.
*** RESPONSE EIGENVALUE = 0.7828E-06    OSCILLATION LIMIT = 0.5881
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***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303    VERSION=HP 9000/7XX    12:24:55 JUN 26, 1996 CP= 9663.670
FOR SUPPORT CALL ROBERT BAHNEY    PHONE (702) 794-5337    FAX (702) 794-1844
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40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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HT FLOW CONVERGENCE VALUE= 39.53    CRITERION= 0.1588
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.7043E-01    CRITERION= 0.1538    <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 1 COMPLETED. CUM ITER = 241
*** TIME = 0.954618E+08    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8176E-06    OSCILLATION LIMIT = 0.6450
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37    CRITERION= 0.1588
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.6987E-01    CRITERION= 0.1536    <<< CONVERGED
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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 2 COMPLETED. CUM ITER = 242
*** TIME = 0.962507E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1129E-05 OSCILLATION LIMIT = 0.8904
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1586
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.7114E-01 CRITERION= 0.1537 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 3 COMPLETED. CUM ITER = 243
*** TIME = 0.970397E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.7440E-06 OSCILLATION LIMIT = 0.5870
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1586
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.7009E-01 CRITERION= 0.1535 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 4 COMPLETED. CUM ITER = 244
*** TIME = 0.978286E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1080E-05 OSCILLATION LIMIT = 0.8523
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1585
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.7078E-01 CRITERION= 0.1535 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 5 COMPLETED. CUM ITER = 245
*** TIME = 0.986175E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.7871E-06 OSCILLATION LIMIT = 0.6210
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1585
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.7016E-01 CRITERION= 0.1533 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 6 COMPLETED. CUM ITER = 246
*** TIME = 0.994065E+08 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1039E-05 OSCILLATION LIMIT = 0.8200
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1583
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.7056E-01 CRITERION= 0.1534 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 7 COMPLETED. CUM ITER = 247
*** TIME = 0.100195E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8113E-06 OSCILLATION LIMIT = 0.6400
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1584
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.7019E-01 CRITERION= 0.1532 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 8 COMPLETED. CUM ITER = 248
*** TIME = 0.100984E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1016E-05 OSCILLATION LIMIT = 0.8014
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1582
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.7042E-01 CRITERION= 0.1532 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 9 COMPLETED. CUM ITER = 249
*** TIME = 0.101773E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8248E-06 OSCILLATION LIMIT = 0.6507
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1582

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.7017E-01 CRITERION= 0.1531 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 10 COMPLETED. CUM ITER = 250
 *** TIME = 0.102562E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1001E-05 OSCILLATION LIMIT = 0.7901
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1581
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.7031E-01 CRITERION= 0.1531 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 11 COMPLETED. CUM ITER = 251
 *** TIME = 0.103351E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8323E-06 OSCILLATION LIMIT = 0.6567
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1581
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.7013E-01 CRITERION= 0.1529 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 12 COMPLETED. CUM ITER = 252
 *** TIME = 0.104140E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9922E-06 OSCILLATION LIMIT = 0.7828
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1579
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.7022E-01 CRITERION= 0.1530 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 13 COMPLETED. CUM ITER = 253
 *** TIME = 0.104929E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8366E-06 OSCILLATION LIMIT = 0.6600
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1579
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.7007E-01 CRITERION= 0.1528 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 14 COMPLETED. CUM ITER = 254
 *** TIME = 0.105718E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9855E-06 OSCILLATION LIMIT = 0.7775
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1578
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.7013E-01 CRITERION= 0.1528 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 15 COMPLETED. CUM ITER = 255
 *** TIME = 0.106507E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8390E-06 OSCILLATION LIMIT = 0.6619
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1578
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.7001E-01 CRITERION= 0.1526 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 16 COMPLETED. CUM ITER = 256
 *** TIME = 0.107296E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9804E-06 OSCILLATION LIMIT = 0.7735
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1577
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.7005E-01 CRITERION= 0.1527 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 17 COMPLETED. CUM ITER = 257
 *** TIME = 0.108085E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8404E-06 OSCILLATION LIMIT = 0.6630
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1577
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6994E-01 CRITERION= 0.1525 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 18 COMPLETED. CUM ITER = 258
 *** TIME = 0.108874E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9761E-06 OSCILLATION LIMIT = 0.7701
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1575
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6998E-01 CRITERION= 0.1525 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 19 COMPLETED. CUM ITER = 259
 *** TIME = 0.109663E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8411E-06 OSCILLATION LIMIT = 0.6636
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1575
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6987E-01 CRITERION= 0.1524 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 20 COMPLETED. CUM ITER = 260
 *** TIME = 0.110452E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9723E-06 OSCILLATION LIMIT = 0.7671
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1574
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6990E-01 CRITERION= 0.1524 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 21 COMPLETED. CUM ITER = 261
 *** TIME = 0.111241E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8416E-06 OSCILLATION LIMIT = 0.6640
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1574
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6980E-01 CRITERION= 0.1522 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 22 COMPLETED. CUM ITER = 262
 *** TIME = 0.112030E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9688E-06 OSCILLATION LIMIT = 0.7644
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1573
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6983E-01 CRITERION= 0.1523 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 23 COMPLETED. CUM ITER = 263
 *** TIME = 0.112818E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8418E-06 OSCILLATION LIMIT = 0.6642
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1573
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6972E-01 CRITERION= 0.1521 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 24 COMPLETED. CUM ITER = 264
 *** TIME = 0.113607E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9655E-06 OSCILLATION LIMIT = 0.7618
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1571
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6978E-01 CRITERION= 0.1521 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 25 COMPLETED. CUM ITER = 265
 *** TIME = 0.114396E+09 TIME INC = 788940.

*** RESPONSE EIGENVALUE = 0.8420E-06 OSCILLATION LIMIT = 0.6643
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1571
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6972E-01 CRITERION= 0.1519 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 26 COMPLETED. CUM ITER = 266
 *** TIME = 0.115185E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9624E-06 OSCILLATION LIMIT = 0.7592
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1570
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6978E-01 CRITERION= 0.1520 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 27 COMPLETED. CUM ITER = 267
 *** TIME = 0.115974E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8419E-06 OSCILLATION LIMIT = 0.6642
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1570
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6970E-01 CRITERION= 0.1518 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 28 COMPLETED. CUM ITER = 268
 *** TIME = 0.116763E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9592E-06 OSCILLATION LIMIT = 0.7568
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1569
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6975E-01 CRITERION= 0.1518 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 29 COMPLETED. CUM ITER = 269
 *** TIME = 0.117552E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8419E-06 OSCILLATION LIMIT = 0.6642
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1569
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6966E-01 CRITERION= 0.1517 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 30 COMPLETED. CUM ITER = 270
 *** TIME = 0.118341E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9562E-06 OSCILLATION LIMIT = 0.7544
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1567
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6972E-01 CRITERION= 0.1517 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 31 COMPLETED. CUM ITER = 271
 *** TIME = 0.119130E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.8417E-06 OSCILLATION LIMIT = 0.6641
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1567
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
 HT FLOW CONVERGENCE VALUE= 0.6965E-01 CRITERION= 0.1515 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 16 SUBSTEP 32 COMPLETED. CUM ITER = 272
 *** TIME = 0.119919E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9531E-06 OSCILLATION LIMIT = 0.7520
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1566
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
 HT FLOW CONVERGENCE VALUE= 0.6971E-01 CRITERION= 0.1516 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1


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*** LOAD STEP 16 SUBSTEP 33 COMPLETED. CUM ITER = 273
*** TIME = 0.120708E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8415E-06 OSCILLATION LIMIT = 0.6639
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1566
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.6964E-01 CRITERION= 0.1514 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 34 COMPLETED. CUM ITER = 274
*** TIME = 0.121497E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.9501E-06 OSCILLATION LIMIT = 0.7496
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1564
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.6971E-01 CRITERION= 0.1514 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 35 COMPLETED. CUM ITER = 275
*** TIME = 0.122286E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8413E-06 OSCILLATION LIMIT = 0.6637
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1564
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.6961E-01 CRITERION= 0.1512 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 36 COMPLETED. CUM ITER = 276
*** TIME = 0.123075E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.9471E-06 OSCILLATION LIMIT = 0.7472
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1563
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.6967E-01 CRITERION= 0.1513 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 37 COMPLETED. CUM ITER = 277
*** TIME = 0.123864E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8410E-06 OSCILLATION LIMIT = 0.6635
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1563
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.6959E-01 CRITERION= 0.1511 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 38 COMPLETED. CUM ITER = 278
*** TIME = 0.124653E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.9442E-06 OSCILLATION LIMIT = 0.7449
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.53 CRITERION= 0.1562
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1369
HT FLOW CONVERGENCE VALUE= 0.6965E-01 CRITERION= 0.1511 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 39 COMPLETED. CUM ITER = 279
*** TIME = 0.125441E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.8408E-06 OSCILLATION LIMIT = 0.6633
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 39.37 CRITERION= 0.1562
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1368
HT FLOW CONVERGENCE VALUE= 0.6956E-01 CRITERION= 0.1510 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 16 SUBSTEP 40 COMPLETED. CUM ITER = 280
*** TIME = 0.126230E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.9413E-06 OSCILLATION LIMIT = 0.7426

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***** ANSYS SOLVE COMMAND *****

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 13:00:09 JUN 26, 1996 CP= 11560.400
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1546
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5795E-01 CRITERION= 0.1510 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 1 COMPLETED. CUM ITER = 281
 *** TIME = 0.127019E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1051E-05 OSCILLATION LIMIT = 0.8294
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1546
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5769E-01 CRITERION= 0.1508 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 2 COMPLETED. CUM ITER = 282
 *** TIME = 0.127808E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1250E-05 OSCILLATION LIMIT = 0.9865
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1545
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5851E-01 CRITERION= 0.1509 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 3 COMPLETED. CUM ITER = 283
 *** TIME = 0.128597E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.9690E-06 OSCILLATION LIMIT = 0.7645
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1545
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5795E-01 CRITERION= 0.1507 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 4 COMPLETED. CUM ITER = 284
 *** TIME = 0.129386E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1217E-05 OSCILLATION LIMIT = 0.9603
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1544
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5849E-01 CRITERION= 0.1507 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 5 COMPLETED. CUM ITER = 285
 *** TIME = 0.130175E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1003E-05 OSCILLATION LIMIT = 0.7911
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1544
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5811E-01 CRITERION= 0.1506 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 6 COMPLETED. CUM ITER = 286
 *** TIME = 0.130964E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1186E-05 OSCILLATION LIMIT = 0.9358
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1542
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5846E-01 CRITERION= 0.1506 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 7 COMPLETED. CUM ITER = 287
 *** TIME = 0.131753E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1021E-05 OSCILLATION LIMIT = 0.8057
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1542
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5825E-01 CRITERION= 0.1504 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 8 COMPLETED. CUM ITER = 288
 *** TIME = 0.132542E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1168E-05 OSCILLATION LIMIT = 0.9214
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1541
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5854E-01 CRITERION= 0.1504 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 9 COMPLETED. CUM ITER = 289
 *** TIME = 0.133331E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1031E-05 OSCILLATION LIMIT = 0.8135
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1541
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5829E-01 CRITERION= 0.1503 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 10 COMPLETED. CUM ITER = 290
 *** TIME = 0.134120E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1156E-05 OSCILLATION LIMIT = 0.9124
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1540
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5845E-01 CRITERION= 0.1503 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 11 COMPLETED. CUM ITER = 291
 *** TIME = 0.134909E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1036E-05 OSCILLATION LIMIT = 0.8176
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1540
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5824E-01 CRITERION= 0.1501 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 12 COMPLETED. CUM ITER = 292
 *** TIME = 0.135698E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1149E-05 OSCILLATION LIMIT = 0.9064
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1538
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5837E-01 CRITERION= 0.1502 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 13 COMPLETED. CUM ITER = 293
 *** TIME = 0.136487E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1039E-05 OSCILLATION LIMIT = 0.8198
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1538
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5818E-01 CRITERION= 0.1500 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 14 COMPLETED. CUM ITER = 294
 *** TIME = 0.137276E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1143E-05 OSCILLATION LIMIT = 0.9020
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1537
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5830E-01 CRITERION= 0.1500 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 15 COMPLETED. CUM ITER = 295
 *** TIME = 0.138065E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1040E-05 OSCILLATION LIMIT = 0.8208

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1537
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5812E-01 CRITERION= 0.1499 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 16 COMPLETED. CUM ITER = 296
 *** TIME = 0.138853E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1139E-05 OSCILLATION LIMIT = 0.8986
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1536
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5823E-01 CRITERION= 0.1499 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 17 COMPLETED. CUM ITER = 297
 *** TIME = 0.139642E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1041E-05 OSCILLATION LIMIT = 0.8212
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1536
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5805E-01 CRITERION= 0.1497 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 18 COMPLETED. CUM ITER = 298
 *** TIME = 0.140431E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1135E-05 OSCILLATION LIMIT = 0.8957
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1534
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5815E-01 CRITERION= 0.1498 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 19 COMPLETED. CUM ITER = 299
 *** TIME = 0.141220E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1041E-05 OSCILLATION LIMIT = 0.8212
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.36 CRITERION= 0.1534
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5799E-01 CRITERION= 0.1496 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 20 COMPLETED. CUM ITER = 300
 *** TIME = 0.142009E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1132E-05 OSCILLATION LIMIT = 0.8931
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.52 CRITERION= 0.1533
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5809E-01 CRITERION= 0.1496 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 21 COMPLETED. CUM ITER = 301
 *** TIME = 0.142798E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1041E-05 OSCILLATION LIMIT = 0.8210
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1533
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
 HT FLOW CONVERGENCE VALUE= 0.5793E-01 CRITERION= 0.1495 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 22 COMPLETED. CUM ITER = 302
 *** TIME = 0.143587E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1129E-05 OSCILLATION LIMIT = 0.8908
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.51 CRITERION= 0.1532
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
 HT FLOW CONVERGENCE VALUE= 0.5803E-01 CRITERION= 0.1495 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 17 SUBSTEP 23 COMPLETED. CUM ITER = 303

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*** TIME = 0.144376E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1040E-05    OSCILLATION LIMIT = 0.8206
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.35    CRITERION= 0.1532
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5788E-01    CRITERION= 0.1493    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 24 COMPLETED. CUM ITER = 304
*** TIME = 0.145165E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1126E-05    OSCILLATION LIMIT = 0.8887
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.51    CRITERION= 0.1530
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1161
    HT FLOW CONVERGENCE VALUE= 0.5797E-01    CRITERION= 0.1493    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 25 COMPLETED. CUM ITER = 305
*** TIME = 0.145954E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1040E-05    OSCILLATION LIMIT = 0.8202
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.35    CRITERION= 0.1530
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5782E-01    CRITERION= 0.1492    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 26 COMPLETED. CUM ITER = 306
*** TIME = 0.146743E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1124E-05    OSCILLATION LIMIT = 0.8866
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.51    CRITERION= 0.1529
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5791E-01    CRITERION= 0.1492    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 27 COMPLETED. CUM ITER = 307
*** TIME = 0.147532E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1039E-05    OSCILLATION LIMIT = 0.8197
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.35    CRITERION= 0.1529
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5776E-01    CRITERION= 0.1490    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 28 COMPLETED. CUM ITER = 308
*** TIME = 0.148321E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1121E-05    OSCILLATION LIMIT = 0.8845
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.51    CRITERION= 0.1528
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5786E-01    CRITERION= 0.1491    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 29 COMPLETED. CUM ITER = 309
*** TIME = 0.149110E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1038E-05    OSCILLATION LIMIT = 0.8193
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.35    CRITERION= 0.1528
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5771E-01    CRITERION= 0.1489    <<< CONVERGED
    >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 30 COMPLETED. CUM ITER = 310
*** TIME = 0.149899E+09    TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1119E-05    OSCILLATION LIMIT = 0.8825
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06    UNCHANGED

    HT FLOW CONVERGENCE VALUE= 33.51    CRITERION= 0.1526
    EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
    HT FLOW CONVERGENCE VALUE= 0.5780E-01    CRITERION= 0.1489    <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 31 COMPLETED. CUM ITER = 311
*** TIME = 0.150688E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1038E-05 OSCILLATION LIMIT = 0.8188
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1526
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5765E-01 CRITERION= 0.1488 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 32 COMPLETED. CUM ITER = 312
*** TIME = 0.151477E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1116E-05 OSCILLATION LIMIT = 0.8805
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.51 CRITERION= 0.1525
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5774E-01 CRITERION= 0.1488 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 33 COMPLETED. CUM ITER = 313
*** TIME = 0.152265E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1037E-05 OSCILLATION LIMIT = 0.8182
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1525
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5759E-01 CRITERION= 0.1486 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 34 COMPLETED. CUM ITER = 314
*** TIME = 0.153054E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1114E-05 OSCILLATION LIMIT = 0.8786
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.51 CRITERION= 0.1523
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5768E-01 CRITERION= 0.1487 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 35 COMPLETED. CUM ITER = 315
*** TIME = 0.153843E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1036E-05 OSCILLATION LIMIT = 0.8177
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1524
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5754E-01 CRITERION= 0.1485 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 36 COMPLETED. CUM ITER = 316
*** TIME = 0.154632E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1111E-05 OSCILLATION LIMIT = 0.8766
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.51 CRITERION= 0.1522
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5763E-01 CRITERION= 0.1485 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 37 COMPLETED. CUM ITER = 317
*** TIME = 0.155421E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1036E-05 OSCILLATION LIMIT = 0.8171
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1522
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5748E-01 CRITERION= 0.1484 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 38 COMPLETED. CUM ITER = 318
*** TIME = 0.156210E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1109E-05 OSCILLATION LIMIT = 0.8747
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.50 CRITERION= 0.1521

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5757E-01 CRITERION= 0.1484 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 39 COMPLETED. CUM ITER = 319
*** TIME = 0.156999E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1035E-05 OSCILLATION LIMIT = 0.8166
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 33.35 CRITERION= 0.1521
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1160
HT FLOW CONVERGENCE VALUE= 0.5742E-01 CRITERION= 0.1482 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 17 SUBSTEP 40 COMPLETED. CUM ITER = 320
*** TIME = 0.157788E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1106E-05 OSCILLATION LIMIT = 0.8728

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 13:35:49 JUN 26, 1996 CP= 13466.490
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1509
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9810E-01
HT FLOW CONVERGENCE VALUE= 0.4774E-01 CRITERION= 0.1483 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 1 COMPLETED. CUM ITER = 321
*** TIME = 0.158577E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1273E-05 OSCILLATION LIMIT = 1.005
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1509
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4748E-01 CRITERION= 0.1481 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 2 COMPLETED. CUM ITER = 322
*** TIME = 0.159366E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1440E-05 OSCILLATION LIMIT = 1.136
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1508
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9810E-01
HT FLOW CONVERGENCE VALUE= 0.4813E-01 CRITERION= 0.1481 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 3 COMPLETED. CUM ITER = 323
*** TIME = 0.160155E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1182E-05 OSCILLATION LIMIT = 0.9327
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1508
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4756E-01 CRITERION= 0.1480 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 4 COMPLETED. CUM ITER = 324
*** TIME = 0.160944E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1405E-05 OSCILLATION LIMIT = 1.109
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1506
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9810E-01
HT FLOW CONVERGENCE VALUE= 0.4798E-01 CRITERION= 0.1480 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 5 COMPLETED. CUM ITER = 325
*** TIME = 0.161733E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1218E-05 OSCILLATION LIMIT = 0.9612
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1506
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4759E-01 CRITERION= 0.1478 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 6 COMPLETED. CUM ITER = 326
 *** TIME = 0.162522E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1373E-05 OSCILLATION LIMIT = 1.083
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1505
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9810E-01
 HT FLOW CONVERGENCE VALUE= 0.4788E-01 CRITERION= 0.1479 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 7 COMPLETED. CUM ITER = 327
 *** TIME = 0.163311E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1238E-05 OSCILLATION LIMIT = 0.9768
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1505
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4758E-01 CRITERION= 0.1477 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 8 COMPLETED. CUM ITER = 328
 *** TIME = 0.164100E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1355E-05 OSCILLATION LIMIT = 1.069
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1504
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4780E-01 CRITERION= 0.1477 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 9 COMPLETED. CUM ITER = 329
 *** TIME = 0.164888E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1249E-05 OSCILLATION LIMIT = 0.9851
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1504
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4756E-01 CRITERION= 0.1476 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 10 COMPLETED. CUM ITER = 330
 *** TIME = 0.165677E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1343E-05 OSCILLATION LIMIT = 1.060
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1502
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4774E-01 CRITERION= 0.1476 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 11 COMPLETED. CUM ITER = 331
 *** TIME = 0.166466E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1254E-05 OSCILLATION LIMIT = 0.9894
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1503
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4753E-01 CRITERION= 0.1474 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 12 COMPLETED. CUM ITER = 332
 *** TIME = 0.167255E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1336E-05 OSCILLATION LIMIT = 1.054
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1501
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4768E-01 CRITERION= 0.1475 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 13 COMPLETED. CUM ITER = 333
 *** TIME = 0.168044E+09 TIME INC = 788940.

*** RESPONSE EIGENVALUE = 0.1257E-05 OSCILLATION LIMIT = 0.9914
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1501
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4749E-01 CRITERION= 0.1473 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 14 COMPLETED. CUM ITER = 334
 *** TIME = 0.168833E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1331E-05 OSCILLATION LIMIT = 1.050
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1500
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4763E-01 CRITERION= 0.1473 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 15 COMPLETED. CUM ITER = 335
 *** TIME = 0.169622E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1258E-05 OSCILLATION LIMIT = 0.9921
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1500
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4745E-01 CRITERION= 0.1472 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 16 COMPLETED. CUM ITER = 336
 *** TIME = 0.170411E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1327E-05 OSCILLATION LIMIT = 1.047
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1499
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4758E-01 CRITERION= 0.1472 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 17 COMPLETED. CUM ITER = 337
 *** TIME = 0.171200E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1258E-05 OSCILLATION LIMIT = 0.9922
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1499
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4741E-01 CRITERION= 0.1470 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 18 COMPLETED. CUM ITER = 338
 *** TIME = 0.171989E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1324E-05 OSCILLATION LIMIT = 1.044
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.29 CRITERION= 0.1497
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4753E-01 CRITERION= 0.1471 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 19 COMPLETED. CUM ITER = 339
 *** TIME = 0.172778E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1257E-05 OSCILLATION LIMIT = 0.9918
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.13 CRITERION= 0.1497
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4737E-01 CRITERION= 0.1469 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 20 COMPLETED. CUM ITER = 340
 *** TIME = 0.173567E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1321E-05 OSCILLATION LIMIT = 1.042
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1496
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4749E-01 CRITERION= 0.1470 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 18 SUBSTEP 21 COMPLETED. CUM ITER = 341
 *** TIME = 0.174356E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1256E-05 OSCILLATION LIMIT = 0.9912
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1496
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4733E-01 CRITERION= 0.1468 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 22 COMPLETED. CUM ITER = 342
 *** TIME = 0.175145E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1318E-05 OSCILLATION LIMIT = 1.040
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1495
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4744E-01 CRITERION= 0.1468 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 23 COMPLETED. CUM ITER = 343
 *** TIME = 0.175934E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1256E-05 OSCILLATION LIMIT = 0.9905
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1495
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4728E-01 CRITERION= 0.1467 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 24 COMPLETED. CUM ITER = 344
 *** TIME = 0.176723E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1316E-05 OSCILLATION LIMIT = 1.038
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1493
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9809E-01
 HT FLOW CONVERGENCE VALUE= 0.4739E-01 CRITERION= 0.1467 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 25 COMPLETED. CUM ITER = 345
 *** TIME = 0.177512E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1255E-05 OSCILLATION LIMIT = 0.9898
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1494
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4724E-01 CRITERION= 0.1465 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 26 COMPLETED. CUM ITER = 346
 *** TIME = 0.178300E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1313E-05 OSCILLATION LIMIT = 1.036
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1492
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
 HT FLOW CONVERGENCE VALUE= 0.4735E-01 CRITERION= 0.1466 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 27 COMPLETED. CUM ITER = 347
 *** TIME = 0.179089E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1254E-05 OSCILLATION LIMIT = 0.9890
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1492
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4719E-01 CRITERION= 0.1464 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 28 COMPLETED. CUM ITER = 348
 *** TIME = 0.179878E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1311E-05 OSCILLATION LIMIT = 1.034
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1491
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01

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HT FLOW CONVERGENCE VALUE= 0.4730E-01 CRITERION= 0.1464 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 29 COMPLETED. CUM ITER = 349
*** TIME = 0.180667E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1253E-05 OSCILLATION LIMIT = 0.9882
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1491
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4713E-01 CRITERION= 0.1463 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 30 COMPLETED. CUM ITER = 350
*** TIME = 0.181456E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1308E-05 OSCILLATION LIMIT = 1.032
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1490
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
HT FLOW CONVERGENCE VALUE= 0.4723E-01 CRITERION= 0.1463 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 31 COMPLETED. CUM ITER = 351
*** TIME = 0.182245E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1251E-05 OSCILLATION LIMIT = 0.9873
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1490
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4709E-01 CRITERION= 0.1461 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 32 COMPLETED. CUM ITER = 352
*** TIME = 0.183034E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1306E-05 OSCILLATION LIMIT = 1.030
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1488
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
HT FLOW CONVERGENCE VALUE= 0.4719E-01 CRITERION= 0.1462 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 33 COMPLETED. CUM ITER = 353
*** TIME = 0.183823E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1250E-05 OSCILLATION LIMIT = 0.9865
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1488
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4704E-01 CRITERION= 0.1460 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 34 COMPLETED. CUM ITER = 354
*** TIME = 0.184612E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1304E-05 OSCILLATION LIMIT = 1.029
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1487
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
HT FLOW CONVERGENCE VALUE= 0.4714E-01 CRITERION= 0.1460 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 35 COMPLETED. CUM ITER = 355
*** TIME = 0.185401E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1249E-05 OSCILLATION LIMIT = 0.9856
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1487
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
HT FLOW CONVERGENCE VALUE= 0.4700E-01 CRITERION= 0.1459 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 18 SUBSTEP 36 COMPLETED. CUM ITER = 356
*** TIME = 0.186190E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1302E-05 OSCILLATION LIMIT = 1.027
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

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HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1486
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
 HT FLOW CONVERGENCE VALUE= 0.4710E-01 CRITERION= 0.1459 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 37 COMPLETED. CUM ITER = 357
 *** TIME = 0.186979E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1248E-05 OSCILLATION LIMIT = 0.9847
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1486
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4695E-01 CRITERION= 0.1457 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 38 COMPLETED. CUM ITER = 358
 *** TIME = 0.187768E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1299E-05 OSCILLATION LIMIT = 1.025
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.28 CRITERION= 0.1484
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9808E-01
 HT FLOW CONVERGENCE VALUE= 0.4705E-01 CRITERION= 0.1458 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 39 COMPLETED. CUM ITER = 359
 *** TIME = 0.188557E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1247E-05 OSCILLATION LIMIT = 0.9839
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 28.12 CRITERION= 0.1485
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9799E-01
 HT FLOW CONVERGENCE VALUE= 0.4691E-01 CRITERION= 0.1456 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 18 SUBSTEP 40 COMPLETED. CUM ITER = 360
 *** TIME = 0.189346E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1297E-05 OSCILLATION LIMIT = 1.023

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 14:14:16 JUN 26, 1996 CP= 15375.260
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1474
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8036E-01
 HT FLOW CONVERGENCE VALUE= 0.3764E-01 CRITERION= 0.1457 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 1 COMPLETED. CUM ITER = 361
 *** TIME = 0.190135E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1686E-05 OSCILLATION LIMIT = 1.330
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1475
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3736E-01 CRITERION= 0.1455 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 2 COMPLETED. CUM ITER = 362
 *** TIME = 0.190924E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1877E-05 OSCILLATION LIMIT = 1.481
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1473
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8036E-01
 HT FLOW CONVERGENCE VALUE= 0.3795E-01 CRITERION= 0.1455 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 3 COMPLETED. CUM ITER = 363
 *** TIME = 0.191712E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1561E-05 OSCILLATION LIMIT = 1.232

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1473
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3744E-01 CRITERION= 0.1454 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 4 COMPLETED. CUM ITER = 364
 *** TIME = 0.192501E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1824E-05 OSCILLATION LIMIT = 1.439
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1472
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8036E-01
 HT FLOW CONVERGENCE VALUE= 0.3782E-01 CRITERION= 0.1454 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 5 COMPLETED. CUM ITER = 365
 *** TIME = 0.193290E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1613E-05 OSCILLATION LIMIT = 1.273
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1472
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3746E-01 CRITERION= 0.1452 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 6 COMPLETED. CUM ITER = 366
 *** TIME = 0.194079E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1780E-05 OSCILLATION LIMIT = 1.404
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1471
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3774E-01 CRITERION= 0.1453 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 7 COMPLETED. CUM ITER = 367
 *** TIME = 0.194868E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1642E-05 OSCILLATION LIMIT = 1.295
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1471
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3747E-01 CRITERION= 0.1451 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 8 COMPLETED. CUM ITER = 368
 *** TIME = 0.195657E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1754E-05 OSCILLATION LIMIT = 1.384
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1469
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3767E-01 CRITERION= 0.1451 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 9 COMPLETED. CUM ITER = 369
 *** TIME = 0.196446E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1657E-05 OSCILLATION LIMIT = 1.307
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1470
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3745E-01 CRITERION= 0.1450 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 10 COMPLETED. CUM ITER = 370
 *** TIME = 0.197235E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1739E-05 OSCILLATION LIMIT = 1.372
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1468
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3762E-01 CRITERION= 0.1450 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 11 COMPLETED. CUM ITER = 371

*** TIME = 0.198024E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1665E-05 OSCILLATION LIMIT = 1.314
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1468
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3743E-01 CRITERION= 0.1448 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 12 COMPLETED. CUM ITER = 372
 *** TIME = 0.198813E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1729E-05 OSCILLATION LIMIT = 1.364
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1467
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3758E-01 CRITERION= 0.1449 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 13 COMPLETED. CUM ITER = 373
 *** TIME = 0.199602E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1669E-05 OSCILLATION LIMIT = 1.317
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1467
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3740E-01 CRITERION= 0.1447 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 14 COMPLETED. CUM ITER = 374
 *** TIME = 0.200391E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1723E-05 OSCILLATION LIMIT = 1.359
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1466
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3753E-01 CRITERION= 0.1448 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 15 COMPLETED. CUM ITER = 375
 *** TIME = 0.201180E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1670E-05 OSCILLATION LIMIT = 1.318
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1466
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3737E-01 CRITERION= 0.1446 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 16 COMPLETED. CUM ITER = 376
 *** TIME = 0.201969E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1718E-05 OSCILLATION LIMIT = 1.356
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1464
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3749E-01 CRITERION= 0.1446 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 17 COMPLETED. CUM ITER = 377
 *** TIME = 0.202758E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1670E-05 OSCILLATION LIMIT = 1.318
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1464
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3734E-01 CRITERION= 0.1445 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 18 COMPLETED. CUM ITER = 378
 *** TIME = 0.203547E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1715E-05 OSCILLATION LIMIT = 1.353
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1463
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8035E-01
 HT FLOW CONVERGENCE VALUE= 0.3745E-01 CRITERION= 0.1445 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 19 COMPLETED. CUM ITER = 379
*** TIME = 0.204335E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1670E-05 OSCILLATION LIMIT = 1.317
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1463
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
HT FLOW CONVERGENCE VALUE= 0.3730E-01 CRITERION= 0.1443 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 20 COMPLETED. CUM ITER = 380
*** TIME = 0.205124E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1712E-05 OSCILLATION LIMIT = 1.350
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1462
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
HT FLOW CONVERGENCE VALUE= 0.3742E-01 CRITERION= 0.1444 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 21 COMPLETED. CUM ITER = 381
*** TIME = 0.205913E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1669E-05 OSCILLATION LIMIT = 1.317
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1462
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
HT FLOW CONVERGENCE VALUE= 0.3727E-01 CRITERION= 0.1442 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 22 COMPLETED. CUM ITER = 382
*** TIME = 0.206702E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1709E-05 OSCILLATION LIMIT = 1.348
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.19 CRITERION= 0.1461
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
HT FLOW CONVERGENCE VALUE= 0.3737E-01 CRITERION= 0.1442 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 23 COMPLETED. CUM ITER = 383
*** TIME = 0.207491E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1668E-05 OSCILLATION LIMIT = 1.316
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1461
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
HT FLOW CONVERGENCE VALUE= 0.3723E-01 CRITERION= 0.1441 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 24 COMPLETED. CUM ITER = 384
*** TIME = 0.208280E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1706E-05 OSCILLATION LIMIT = 1.346
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1459
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
HT FLOW CONVERGENCE VALUE= 0.3734E-01 CRITERION= 0.1441 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 25 COMPLETED. CUM ITER = 385
*** TIME = 0.209069E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1666E-05 OSCILLATION LIMIT = 1.315
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1459
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
HT FLOW CONVERGENCE VALUE= 0.3719E-01 CRITERION= 0.1440 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 19 SUBSTEP 26 COMPLETED. CUM ITER = 386
*** TIME = 0.209858E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1704E-05 OSCILLATION LIMIT = 1.344
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1458

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3730E-01 CRITERION= 0.1440 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 27 COMPLETED. CUM ITER = 387
 *** TIME = 0.210647E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1665E-05 OSCILLATION LIMIT = 1.313
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1458
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3716E-01 CRITERION= 0.1438 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 28 COMPLETED. CUM ITER = 388
 *** TIME = 0.211436E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1702E-05 OSCILLATION LIMIT = 1.342
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1457
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3726E-01 CRITERION= 0.1439 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 29 COMPLETED. CUM ITER = 389
 *** TIME = 0.212225E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1663E-05 OSCILLATION LIMIT = 1.312
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.03 CRITERION= 0.1457
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3713E-01 CRITERION= 0.1437 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 30 COMPLETED. CUM ITER = 390
 *** TIME = 0.213014E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1699E-05 OSCILLATION LIMIT = 1.341
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1455
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3723E-01 CRITERION= 0.1437 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 31 COMPLETED. CUM ITER = 391
 *** TIME = 0.213803E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1662E-05 OSCILLATION LIMIT = 1.311
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.02 CRITERION= 0.1456
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3709E-01 CRITERION= 0.1436 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 32 COMPLETED. CUM ITER = 392
 *** TIME = 0.214592E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1697E-05 OSCILLATION LIMIT = 1.339
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1454
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3719E-01 CRITERION= 0.1436 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 33 COMPLETED. CUM ITER = 393
 *** TIME = 0.215381E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1660E-05 OSCILLATION LIMIT = 1.310
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.02 CRITERION= 0.1454
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3705E-01 CRITERION= 0.1434 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 34 COMPLETED. CUM ITER = 394
 *** TIME = 0.216170E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1695E-05 OSCILLATION LIMIT = 1.337
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1453
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3715E-01 CRITERION= 0.1435 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 35 COMPLETED. CUM ITER = 395
 *** TIME = 0.216959E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1659E-05 OSCILLATION LIMIT = 1.309
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.02 CRITERION= 0.1453
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3702E-01 CRITERION= 0.1433 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 36 COMPLETED. CUM ITER = 396
 *** TIME = 0.217747E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1692E-05 OSCILLATION LIMIT = 1.335
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1452
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3711E-01 CRITERION= 0.1434 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 37 COMPLETED. CUM ITER = 397
 *** TIME = 0.218536E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1658E-05 OSCILLATION LIMIT = 1.308
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.02 CRITERION= 0.1452
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3698E-01 CRITERION= 0.1432 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 38 COMPLETED. CUM ITER = 398
 *** TIME = 0.219325E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1690E-05 OSCILLATION LIMIT = 1.333
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.18 CRITERION= 0.1450
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8034E-01
 HT FLOW CONVERGENCE VALUE= 0.3707E-01 CRITERION= 0.1432 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 39 COMPLETED. CUM ITER = 399
 *** TIME = 0.220114E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1656E-05 OSCILLATION LIMIT = 1.307
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 23.02 CRITERION= 0.1451
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.8023E-01
 HT FLOW CONVERGENCE VALUE= 0.3694E-01 CRITERION= 0.1431 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 19 SUBSTEP 40 COMPLETED. CUM ITER = 400
 *** TIME = 0.220903E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1688E-05 OSCILLATION LIMIT = 1.331

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 14:51:22 JUN 26, 1996 CP= 17288.120
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1446
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7353E-01
 HT FLOW CONVERGENCE VALUE= 0.3349E-01 CRITERION= 0.1431 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 1 COMPLETED. CUM ITER = 401
 *** TIME = 0.221692E+09 TIME INC = 788940.

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*** RESPONSE EIGENVALUE = 0.1869E-05  OSCILLATION LIMIT = 1.475
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.01  CRITERION= 0.1446
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
  HT FLOW CONVERGENCE VALUE= 0.3332E-01 CRITERION= 0.1429  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 2 COMPLETED. CUM ITER = 402
*** TIME = 0.222481E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1955E-05  OSCILLATION LIMIT = 1.543
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.16  CRITERION= 0.1445
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7353E-01
  HT FLOW CONVERGENCE VALUE= 0.3358E-01 CRITERION= 0.1430  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 3 COMPLETED. CUM ITER = 403
*** TIME = 0.223270E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1813E-05  OSCILLATION LIMIT = 1.430
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.01  CRITERION= 0.1445
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
  HT FLOW CONVERGENCE VALUE= 0.3333E-01 CRITERION= 0.1428  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 4 COMPLETED. CUM ITER = 404
*** TIME = 0.224059E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1932E-05  OSCILLATION LIMIT = 1.525
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.16  CRITERION= 0.1444
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
  HT FLOW CONVERGENCE VALUE= 0.3352E-01 CRITERION= 0.1428  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 5 COMPLETED. CUM ITER = 405
*** TIME = 0.224848E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1835E-05  OSCILLATION LIMIT = 1.447
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.01  CRITERION= 0.1444
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
  HT FLOW CONVERGENCE VALUE= 0.3332E-01 CRITERION= 0.1427  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 6 COMPLETED. CUM ITER = 406
*** TIME = 0.225637E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1912E-05  OSCILLATION LIMIT = 1.509
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.16  CRITERION= 0.1442
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
  HT FLOW CONVERGENCE VALUE= 0.3346E-01 CRITERION= 0.1427  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 7 COMPLETED. CUM ITER = 407
*** TIME = 0.226426E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1846E-05  OSCILLATION LIMIT = 1.456
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.01  CRITERION= 0.1443
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
  HT FLOW CONVERGENCE VALUE= 0.3329E-01 CRITERION= 0.1426  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 8 COMPLETED. CUM ITER = 408
*** TIME = 0.227215E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1900E-05  OSCILLATION LIMIT = 1.499
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06  UNCHANGED

  HT FLOW CONVERGENCE VALUE= 21.16  CRITERION= 0.1441
  EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
  HT FLOW CONVERGENCE VALUE= 0.3342E-01 CRITERION= 0.1426  <<< CONVERGED
  >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

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*** LOAD STEP 20 SUBSTEP 9 COMPLETED. CUM ITER = 409
*** TIME = 0.228004E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1852E-05 OSCILLATION LIMIT = 1.461
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.01 CRITERION= 0.1441
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
HT FLOW CONVERGENCE VALUE= 0.3326E-01 CRITERION= 0.1424 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 10 COMPLETED. CUM ITER = 410
*** TIME = 0.228793E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1892E-05 OSCILLATION LIMIT = 1.493
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1440
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
HT FLOW CONVERGENCE VALUE= 0.3338E-01 CRITERION= 0.1425 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 11 COMPLETED. CUM ITER = 411
*** TIME = 0.229582E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1854E-05 OSCILLATION LIMIT = 1.463
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.01 CRITERION= 0.1440
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
HT FLOW CONVERGENCE VALUE= 0.3324E-01 CRITERION= 0.1423 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 12 COMPLETED. CUM ITER = 412
*** TIME = 0.230371E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1887E-05 OSCILLATION LIMIT = 1.489
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1439
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
HT FLOW CONVERGENCE VALUE= 0.3334E-01 CRITERION= 0.1424 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 13 COMPLETED. CUM ITER = 413
*** TIME = 0.231159E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1855E-05 OSCILLATION LIMIT = 1.463
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1439
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
HT FLOW CONVERGENCE VALUE= 0.3320E-01 CRITERION= 0.1422 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 14 COMPLETED. CUM ITER = 414
*** TIME = 0.231948E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1883E-05 OSCILLATION LIMIT = 1.485
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1437
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
HT FLOW CONVERGENCE VALUE= 0.3330E-01 CRITERION= 0.1422 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 15 COMPLETED. CUM ITER = 415
*** TIME = 0.232737E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1854E-05 OSCILLATION LIMIT = 1.463
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1438
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
HT FLOW CONVERGENCE VALUE= 0.3317E-01 CRITERION= 0.1421 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 20 SUBSTEP 16 COMPLETED. CUM ITER = 416
*** TIME = 0.233526E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.1879E-05 OSCILLATION LIMIT = 1.483
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1436
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01

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HT FLOW CONVERGENCE VALUE= 0.3326E-01 CRITERION= 0.1421 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 17 COMPLETED. CUM ITER = 417
 *** TIME = 0.234315E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1854E-05 OSCILLATION LIMIT = 1.462
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1436
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3313E-01 CRITERION= 0.1419 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 18 COMPLETED. CUM ITER = 418
 *** TIME = 0.235104E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1877E-05 OSCILLATION LIMIT = 1.481
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1435
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
 HT FLOW CONVERGENCE VALUE= 0.3322E-01 CRITERION= 0.1420 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 19 COMPLETED. CUM ITER = 419
 *** TIME = 0.235893E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1852E-05 OSCILLATION LIMIT = 1.461
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1435
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3310E-01 CRITERION= 0.1418 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 20 COMPLETED. CUM ITER = 420
 *** TIME = 0.236682E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1874E-05 OSCILLATION LIMIT = 1.478
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1434
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7352E-01
 HT FLOW CONVERGENCE VALUE= 0.3317E-01 CRITERION= 0.1419 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 21 COMPLETED. CUM ITER = 421
 *** TIME = 0.237471E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1851E-05 OSCILLATION LIMIT = 1.460
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1434
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3305E-01 CRITERION= 0.1417 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 22 COMPLETED. CUM ITER = 422
 *** TIME = 0.238260E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1871E-05 OSCILLATION LIMIT = 1.476
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1433
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3314E-01 CRITERION= 0.1417 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 23 COMPLETED. CUM ITER = 423
 *** TIME = 0.239049E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1849E-05 OSCILLATION LIMIT = 1.459
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1433
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3302E-01 CRITERION= 0.1416 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 24 COMPLETED. CUM ITER = 424
 *** TIME = 0.239838E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1869E-05 OSCILLATION LIMIT = 1.475
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1431
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3310E-01 CRITERION= 0.1416 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 25 COMPLETED. CUM ITER = 425
 *** TIME = 0.240627E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1848E-05 OSCILLATION LIMIT = 1.458
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1432
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3298E-01 CRITERION= 0.1414 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 26 COMPLETED. CUM ITER = 426
 *** TIME = 0.241416E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1867E-05 OSCILLATION LIMIT = 1.473
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1430
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3306E-01 CRITERION= 0.1415 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 27 COMPLETED. CUM ITER = 427
 *** TIME = 0.242205E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1846E-05 OSCILLATION LIMIT = 1.457
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1430
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3294E-01 CRITERION= 0.1413 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 28 COMPLETED. CUM ITER = 428
 *** TIME = 0.242994E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1864E-05 OSCILLATION LIMIT = 1.471
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1429
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3300E-01 CRITERION= 0.1414 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 29 COMPLETED. CUM ITER = 429
 *** TIME = 0.243782E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1845E-05 OSCILLATION LIMIT = 1.455
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1429
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3288E-01 CRITERION= 0.1412 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 30 COMPLETED. CUM ITER = 430
 *** TIME = 0.244571E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1862E-05 OSCILLATION LIMIT = 1.469
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1428
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3296E-01 CRITERION= 0.1412 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 31 COMPLETED. CUM ITER = 431
 *** TIME = 0.245360E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1843E-05 OSCILLATION LIMIT = 1.454
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1428
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3285E-01 CRITERION= 0.1411 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 32 COMPLETED. CUM ITER = 432
 *** TIME = 0.246149E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1860E-05 OSCILLATION LIMIT = 1.467

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1426
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3293E-01 CRITERION= 0.1411 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 33 COMPLETED. CUM ITER = 433
 *** TIME = 0.246938E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1842E-05 OSCILLATION LIMIT = 1.453
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1427
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3282E-01 CRITERION= 0.1410 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 34 COMPLETED. CUM ITER = 434
 *** TIME = 0.247727E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1857E-05 OSCILLATION LIMIT = 1.465
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1425
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3289E-01 CRITERION= 0.1410 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 35 COMPLETED. CUM ITER = 435
 *** TIME = 0.248516E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1840E-05 OSCILLATION LIMIT = 1.452
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1425
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3279E-01 CRITERION= 0.1408 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 36 COMPLETED. CUM ITER = 436
 *** TIME = 0.249305E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1855E-05 OSCILLATION LIMIT = 1.464
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.16 CRITERION= 0.1424
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3286E-01 CRITERION= 0.1409 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 37 COMPLETED. CUM ITER = 437
 *** TIME = 0.250094E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1839E-05 OSCILLATION LIMIT = 1.451
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1424
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3276E-01 CRITERION= 0.1407 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 38 COMPLETED. CUM ITER = 438
 *** TIME = 0.250883E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1853E-05 OSCILLATION LIMIT = 1.462
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.15 CRITERION= 0.1423
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7351E-01
 HT FLOW CONVERGENCE VALUE= 0.3283E-01 CRITERION= 0.1407 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 39 COMPLETED. CUM ITER = 439
 *** TIME = 0.251672E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1837E-05 OSCILLATION LIMIT = 1.449
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 21.00 CRITERION= 0.1423
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7342E-01
 HT FLOW CONVERGENCE VALUE= 0.3273E-01 CRITERION= 0.1406 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 20 SUBSTEP 40 COMPLETED. CUM ITER = 440

*** TIME = 0.252461E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.1851E-05 OSCILLATION LIMIT = 1.460

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 15:28:44 JUN 26, 1996 CP= 19198.160
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1412
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4695E-01
 HT FLOW CONVERGENCE VALUE= 0.1987E-01 CRITERION= 0.1406 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 1 COMPLETED. CUM ITER = 441
 *** TIME = 0.253250E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4060E-05 OSCILLATION LIMIT = 3.203
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.26 CRITERION= 0.1412
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1966E-01 CRITERION= 0.1405 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 2 COMPLETED. CUM ITER = 442
 *** TIME = 0.254039E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4677E-05 OSCILLATION LIMIT = 3.690
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1411
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4695E-01
 HT FLOW CONVERGENCE VALUE= 0.1997E-01 CRITERION= 0.1405 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 3 COMPLETED. CUM ITER = 443
 *** TIME = 0.254828E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3612E-05 OSCILLATION LIMIT = 2.849
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.26 CRITERION= 0.1411
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1968E-01 CRITERION= 0.1403 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 4 COMPLETED. CUM ITER = 444
 *** TIME = 0.255617E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4459E-05 OSCILLATION LIMIT = 3.518
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1410
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4694E-01
 HT FLOW CONVERGENCE VALUE= 0.1989E-01 CRITERION= 0.1404 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 5 COMPLETED. CUM ITER = 445
 *** TIME = 0.256406E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.3824E-05 OSCILLATION LIMIT = 3.017
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1410
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1968E-01 CRITERION= 0.1402 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 6 COMPLETED. CUM ITER = 446
 *** TIME = 0.257194E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4285E-05 OSCILLATION LIMIT = 3.380
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1408
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4694E-01
 HT FLOW CONVERGENCE VALUE= 0.1985E-01 CRITERION= 0.1403 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 7 COMPLETED. CUM ITER = 447
*** TIME = 0.257983E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.3944E-05 OSCILLATION LIMIT = 3.112
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1409
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1967E-01 CRITERION= 0.1401 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 8 COMPLETED. CUM ITER = 448
*** TIME = 0.258772E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4187E-05 OSCILLATION LIMIT = 3.303
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1407
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4694E-01
HT FLOW CONVERGENCE VALUE= 0.1981E-01 CRITERION= 0.1401 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 9 COMPLETED. CUM ITER = 449
*** TIME = 0.259561E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4010E-05 OSCILLATION LIMIT = 3.164
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1408
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1966E-01 CRITERION= 0.1400 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 10 COMPLETED. CUM ITER = 450
*** TIME = 0.260350E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4131E-05 OSCILLATION LIMIT = 3.259
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1406
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1978E-01 CRITERION= 0.1400 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 11 COMPLETED. CUM ITER = 451
*** TIME = 0.261139E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4046E-05 OSCILLATION LIMIT = 3.192
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1406
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1965E-01 CRITERION= 0.1399 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 12 COMPLETED. CUM ITER = 452
*** TIME = 0.261928E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4099E-05 OSCILLATION LIMIT = 3.234
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1405
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1976E-01 CRITERION= 0.1399 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 13 COMPLETED. CUM ITER = 453
*** TIME = 0.262717E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4065E-05 OSCILLATION LIMIT = 3.207
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1405
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1963E-01 CRITERION= 0.1397 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 14 COMPLETED. CUM ITER = 454
*** TIME = 0.263506E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4080E-05 OSCILLATION LIMIT = 3.219
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1404

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1974E-01 CRITERION= 0.1398 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 15 COMPLETED. CUM ITER = 455
*** TIME = 0.264295E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4074E-05 OSCILLATION LIMIT = 3.214
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1404
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1962E-01 CRITERION= 0.1396 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 16 COMPLETED. CUM ITER = 456
*** TIME = 0.265084E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4069E-05 OSCILLATION LIMIT = 3.210
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1402
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1971E-01 CRITERION= 0.1396 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 17 COMPLETED. CUM ITER = 457
*** TIME = 0.265873E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4078E-05 OSCILLATION LIMIT = 3.217
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1403
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1960E-01 CRITERION= 0.1395 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 18 COMPLETED. CUM ITER = 458
*** TIME = 0.266662E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4061E-05 OSCILLATION LIMIT = 3.204
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1401
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1969E-01 CRITERION= 0.1395 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 19 COMPLETED. CUM ITER = 459
*** TIME = 0.267451E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4079E-05 OSCILLATION LIMIT = 3.218
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1402
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1958E-01 CRITERION= 0.1394 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 20 COMPLETED. CUM ITER = 460
*** TIME = 0.268240E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4056E-05 OSCILLATION LIMIT = 3.200
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1400
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
HT FLOW CONVERGENCE VALUE= 0.1967E-01 CRITERION= 0.1394 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 21 COMPLETED. CUM ITER = 461
*** TIME = 0.269029E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4078E-05 OSCILLATION LIMIT = 3.217
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1400
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
HT FLOW CONVERGENCE VALUE= 0.1957E-01 CRITERION= 0.1393 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 21 SUBSTEP 22 COMPLETED. CUM ITER = 462
*** TIME = 0.269818E+09 TIME INC = 788940.
*** RESPONSE EIGENVALUE = 0.4052E-05 OSCILLATION LIMIT = 3.196
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

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HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1399
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
 HT FLOW CONVERGENCE VALUE= 0.1965E-01 CRITERION= 0.1393 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 23 COMPLETED. CUM ITER = 463
 *** TIME = 0.270606E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4076E-05 OSCILLATION LIMIT = 3.216
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1399
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1955E-01 CRITERION= 0.1391 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 24 COMPLETED. CUM ITER = 464
 *** TIME = 0.271395E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4048E-05 OSCILLATION LIMIT = 3.194
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1398
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
 HT FLOW CONVERGENCE VALUE= 0.1963E-01 CRITERION= 0.1392 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 25 COMPLETED. CUM ITER = 465
 *** TIME = 0.272184E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4074E-05 OSCILLATION LIMIT = 3.214
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1398
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1953E-01 CRITERION= 0.1390 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 26 COMPLETED. CUM ITER = 466
 *** TIME = 0.272973E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4045E-05 OSCILLATION LIMIT = 3.191
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1396
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4693E-01
 HT FLOW CONVERGENCE VALUE= 0.1961E-01 CRITERION= 0.1390 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 27 COMPLETED. CUM ITER = 467
 *** TIME = 0.273762E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4071E-05 OSCILLATION LIMIT = 3.212
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1397
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1951E-01 CRITERION= 0.1389 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 28 COMPLETED. CUM ITER = 468
 *** TIME = 0.274551E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4042E-05 OSCILLATION LIMIT = 3.189
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1395
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1959E-01 CRITERION= 0.1389 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 29 COMPLETED. CUM ITER = 469
 *** TIME = 0.275340E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4069E-05 OSCILLATION LIMIT = 3.210
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1395
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1949E-01 CRITERION= 0.1388 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 30 COMPLETED. CUM ITER = 470
 *** TIME = 0.276129E+09 TIME INC = 788940.

*** RESPONSE EIGENVALUE = 0.4040E-05 OSCILLATION LIMIT = 3.187
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1394
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1957E-01 CRITERION= 0.1388 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 31 COMPLETED. CUM ITER = 471
 *** TIME = 0.276918E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4066E-05 OSCILLATION LIMIT = 3.208
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1394
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1947E-01 CRITERION= 0.1386 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 32 COMPLETED. CUM ITER = 472
 *** TIME = 0.277707E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4037E-05 OSCILLATION LIMIT = 3.185
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1393
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1955E-01 CRITERION= 0.1387 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 33 COMPLETED. CUM ITER = 473
 *** TIME = 0.278496E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4063E-05 OSCILLATION LIMIT = 3.206
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1393
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1946E-01 CRITERION= 0.1385 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 34 COMPLETED. CUM ITER = 474
 *** TIME = 0.279285E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4034E-05 OSCILLATION LIMIT = 3.183
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1392
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1953E-01 CRITERION= 0.1386 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 35 COMPLETED. CUM ITER = 475
 *** TIME = 0.280074E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4061E-05 OSCILLATION LIMIT = 3.204
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1392
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1943E-01 CRITERION= 0.1384 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 36 COMPLETED. CUM ITER = 476
 *** TIME = 0.280863E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4032E-05 OSCILLATION LIMIT = 3.181
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1390
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1951E-01 CRITERION= 0.1384 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 21 SUBSTEP 37 COMPLETED. CUM ITER = 477
 *** TIME = 0.281652E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4058E-05 OSCILLATION LIMIT = 3.202
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1391
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1941E-01 CRITERION= 0.1383 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 21 SUBSTEP 38 COMPLETED. CUM ITER = 478
 *** TIME = 0.282441E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4029E-05 OSCILLATION LIMIT = 3.179
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.41 CRITERION= 0.1389
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4692E-01
 HT FLOW CONVERGENCE VALUE= 0.1949E-01 CRITERION= 0.1383 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 21 SUBSTEP 39 COMPLETED. CUM ITER = 479
 *** TIME = 0.283229E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4056E-05 OSCILLATION LIMIT = 3.200
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 13.25 CRITERION= 0.1389
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4682E-01
 HT FLOW CONVERGENCE VALUE= 0.1940E-01 CRITERION= 0.1382 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 21 SUBSTEP 40 COMPLETED. CUM ITER = 480
 *** TIME = 0.284018E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4026E-05 OSCILLATION LIMIT = 3.176
 Apply loads and solve for 10 to 90 years

*DO LOOP ON PARAMETER= TM FROM 0.31558E+09 TO 0.28402E+10 BY 0.31558E+09
 TIME= 0.31558E+09

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 14 TO 14 STEP 1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM
 24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
 3374.61300 0.000000000E+00 0.000000000E+00 0.000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
 IN RANGE 1 TO 302 STEP 1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
 IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

CONSTRAINT AT KEYPOINT 11
 LOAD LABELS = TEMP
 VALUES = 164.75 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 10
 LOAD LABELS = TEMP
 VALUES = 165.54 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 9
 LOAD LABELS = TEMP
 VALUES = 167.51 0.00000E+00 EXPANSION KEY = 1

***** ANSYS SOLVE COMMAND *****

TRANSFER SOLID MODEL BOUNDARY CONDITIONS TO FINITE ELEMENT MODEL
 CONSTRAINTS TRANSFERRED FROM KEYPOINTS = 147

*** NOTE *** CP= 21109.330 TIME= 16:07:32
 Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
 procedure) for ALL DOFs.

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 16:07:32 JUN 26, 1996 CP= 21109.330
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

LOAD STEP OPTIONS

LOAD STEP NUMBER. 22
 TIME AT END OF THE LOAD STEP. 0.31558E+09
 AUTOMATIC TIME STEPPING ON
 INITIAL NUMBER OF SUBSTEPS 10
 MAXIMUM NUMBER OF SUBSTEPS 40
 MINIMUM NUMBER OF SUBSTEPS 4
 START WITH TIME STEP FROM PREVIOUS SUBSTEP . YES
 MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. . . . 25
 STEP CHANGE BOUNDARY CONDITIONS NO
 TRANSIENT (INERTIA) EFFECTS
 THERMAL DOFS ON
 TRANSIENT INTEGRATION PARAMETERS
 THETA. 0.50000
 OSCILLATION LIMIT CRITERION. 0.50000
 TOLERANCE. 0.20000
 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= 11.70 CRITERION= 0.1386
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4086E-01
 HT FLOW CONVERGENCE VALUE= 0.1689E-01 CRITERION= 0.1382 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 1 COMPLETED. CUM ITER = 481
 *** TIME = 0.284807E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4779E-05 OSCILLATION LIMIT = 3.770
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1387
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1679E-01 CRITERION= 0.1380 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 2 COMPLETED. CUM ITER = 482
 *** TIME = 0.285596E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4847E-05 OSCILLATION LIMIT = 3.824
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.70 CRITERION= 0.1385
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4086E-01
 HT FLOW CONVERGENCE VALUE= 0.1689E-01 CRITERION= 0.1381 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 3 COMPLETED. CUM ITER = 483
 *** TIME = 0.286385E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4666E-05 OSCILLATION LIMIT = 3.682
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1386
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1678E-01 CRITERION= 0.1379 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 4 COMPLETED. CUM ITER = 484
 *** TIME = 0.287174E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4805E-05 OSCILLATION LIMIT = 3.791
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.70 CRITERION= 0.1384

EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4086E-01
 HT FLOW CONVERGENCE VALUE= 0.1687E-01 CRITERION= 0.1380 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 5 COMPLETED. CUM ITER = 485
 *** TIME = 0.287963E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4710E-05 OSCILLATION LIMIT = 3.716
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1384
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1677E-01 CRITERION= 0.1378 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 6 COMPLETED. CUM ITER = 486
 *** TIME = 0.288752E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4767E-05 OSCILLATION LIMIT = 3.761
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.70 CRITERION= 0.1383
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1685E-01 CRITERION= 0.1379 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 7 COMPLETED. CUM ITER = 487
 *** TIME = 0.289541E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4733E-05 OSCILLATION LIMIT = 3.734
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1383
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1675E-01 CRITERION= 0.1377 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 8 COMPLETED. CUM ITER = 488
 *** TIME = 0.290330E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4745E-05 OSCILLATION LIMIT = 3.743
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.70 CRITERION= 0.1382
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1683E-01 CRITERION= 0.1377 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 9 COMPLETED. CUM ITER = 489
 *** TIME = 0.291119E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4745E-05 OSCILLATION LIMIT = 3.744
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1382
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1674E-01 CRITERION= 0.1376 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 10 COMPLETED. CUM ITER = 490
 *** TIME = 0.291908E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4731E-05 OSCILLATION LIMIT = 3.732
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1381
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1681E-01 CRITERION= 0.1376 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 11 COMPLETED. CUM ITER = 491
 *** TIME = 0.292697E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4751E-05 OSCILLATION LIMIT = 3.748
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1381
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1673E-01 CRITERION= 0.1375 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 12 COMPLETED. CUM ITER = 492
 *** TIME = 0.293486E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4722E-05 OSCILLATION LIMIT = 3.725
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1380
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1679E-01 CRITERION= 0.1375 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 13 COMPLETED. CUM ITER = 493
 *** TIME = 0.294275E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4752E-05 OSCILLATION LIMIT = 3.749
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1380
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1671E-01 CRITERION= 0.1374 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 14 COMPLETED. CUM ITER = 494
 *** TIME = 0.295064E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4715E-05 OSCILLATION LIMIT = 3.720
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1378
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1678E-01 CRITERION= 0.1374 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 15 COMPLETED. CUM ITER = 495
 *** TIME = 0.295853E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4752E-05 OSCILLATION LIMIT = 3.749
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1379
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1670E-01 CRITERION= 0.1372 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 16 COMPLETED. CUM ITER = 496
 *** TIME = 0.296641E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4710E-05 OSCILLATION LIMIT = 3.716
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1377
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1676E-01 CRITERION= 0.1373 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 17 COMPLETED. CUM ITER = 497
 *** TIME = 0.297430E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4751E-05 OSCILLATION LIMIT = 3.748
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1378
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1668E-01 CRITERION= 0.1371 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 18 COMPLETED. CUM ITER = 498
 *** TIME = 0.298219E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4706E-05 OSCILLATION LIMIT = 3.713
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1376
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1674E-01 CRITERION= 0.1372 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 19 COMPLETED. CUM ITER = 499
 *** TIME = 0.299008E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4749E-05 OSCILLATION LIMIT = 3.747
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1376
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1667E-01 CRITERION= 0.1370 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 20 COMPLETED. CUM ITER = 500
 *** TIME = 0.299797E+09 TIME INC = 788940.

*** RESPONSE EIGENVALUE = 0.4703E-05 OSCILLATION LIMIT = 3.710
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1375
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1672E-01 CRITERION= 0.1370 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 21 COMPLETED. CUM ITER = 501
 *** TIME = 0.300586E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4747E-05 OSCILLATION LIMIT = 3.745
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1375
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1665E-01 CRITERION= 0.1369 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 22 COMPLETED. CUM ITER = 502
 *** TIME = 0.301375E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4700E-05 OSCILLATION LIMIT = 3.708
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1374
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1671E-01 CRITERION= 0.1369 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 23 COMPLETED. CUM ITER = 503
 *** TIME = 0.302164E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4745E-05 OSCILLATION LIMIT = 3.743
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1374
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1664E-01 CRITERION= 0.1368 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 24 COMPLETED. CUM ITER = 504
 *** TIME = 0.302953E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4696E-05 OSCILLATION LIMIT = 3.705
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1373
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4085E-01
 HT FLOW CONVERGENCE VALUE= 0.1669E-01 CRITERION= 0.1368 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 25 COMPLETED. CUM ITER = 505
 *** TIME = 0.303742E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4742E-05 OSCILLATION LIMIT = 3.741
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1373
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1662E-01 CRITERION= 0.1367 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 26 COMPLETED. CUM ITER = 506
 *** TIME = 0.304531E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4693E-05 OSCILLATION LIMIT = 3.703
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1372
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1667E-01 CRITERION= 0.1367 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 27 COMPLETED. CUM ITER = 507
 *** TIME = 0.305320E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4740E-05 OSCILLATION LIMIT = 3.739
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1372
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1661E-01 CRITERION= 0.1366 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 28 COMPLETED. CUM ITER = 508
 *** TIME = 0.306109E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4690E-05 OSCILLATION LIMIT = 3.700
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1370
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1666E-01 CRITERION= 0.1366 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 29 COMPLETED. CUM ITER = 509
 *** TIME = 0.306898E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4737E-05 OSCILLATION LIMIT = 3.738
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1371
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1659E-01 CRITERION= 0.1364 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 30 COMPLETED. CUM ITER = 510
 *** TIME = 0.307687E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4687E-05 OSCILLATION LIMIT = 3.698
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1369
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1664E-01 CRITERION= 0.1365 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 31 COMPLETED. CUM ITER = 511
 *** TIME = 0.308476E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4735E-05 OSCILLATION LIMIT = 3.736
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1370
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1658E-01 CRITERION= 0.1363 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 32 COMPLETED. CUM ITER = 512
 *** TIME = 0.309265E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4684E-05 OSCILLATION LIMIT = 3.696
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1368
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1662E-01 CRITERION= 0.1364 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 33 COMPLETED. CUM ITER = 513
 *** TIME = 0.310053E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4733E-05 OSCILLATION LIMIT = 3.734
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1368
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1656E-01 CRITERION= 0.1362 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 34 COMPLETED. CUM ITER = 514
 *** TIME = 0.310842E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4681E-05 OSCILLATION LIMIT = 3.693
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1367
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1661E-01 CRITERION= 0.1362 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 22 SUBSTEP 35 COMPLETED. CUM ITER = 515
 *** TIME = 0.311631E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4731E-05 OSCILLATION LIMIT = 3.732
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1367
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01

HT FLOW CONVERGENCE VALUE= 0.1655E-01 CRITERION= 0.1361 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 36 COMPLETED. CUM ITER = 516
 *** TIME = 0.312420E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4678E-05 OSCILLATION LIMIT = 3.691
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1366
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1659E-01 CRITERION= 0.1361 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 37 COMPLETED. CUM ITER = 517
 *** TIME = 0.313209E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4728E-05 OSCILLATION LIMIT = 3.730
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1366
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1653E-01 CRITERION= 0.1360 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 38 COMPLETED. CUM ITER = 518
 *** TIME = 0.313998E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4675E-05 OSCILLATION LIMIT = 3.688
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.69 CRITERION= 0.1365
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.1657E-01 CRITERION= 0.1360 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 39 COMPLETED. CUM ITER = 519
 *** TIME = 0.314787E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4726E-05 OSCILLATION LIMIT = 3.729
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+06 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.54 CRITERION= 0.1365
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4074E-01
 HT FLOW CONVERGENCE VALUE= 0.1651E-01 CRITERION= 0.1359 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 22 SUBSTEP 40 COMPLETED. CUM ITER = 520
 *** TIME = 0.315576E+09 TIME INC = 788940.
 *** RESPONSE EIGENVALUE = 0.4672E-05 OSCILLATION LIMIT = 3.686

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 16:47:24 JUN 26, 1996 CP= 23027.620
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 85.44 CRITERION= 0.1604
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1212 CRITERION= 0.1355 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 1 COMPLETED. CUM ITER = 521
 *** TIME = 0.323465E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5178E-05 OSCILLATION LIMIT = 40.85
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.28 CRITERION= 0.1601
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1203 CRITERION= 0.1350 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 2 COMPLETED. CUM ITER = 522
 *** TIME = 0.331355E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5747E-05 OSCILLATION LIMIT = 45.34

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.43 CRITERION= 0.1597
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1197 CRITERION= 0.1346 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 3 COMPLETED. CUM ITER = 523

*** TIME = 0.339244E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5665E-05 OSCILLATION LIMIT = 44.69

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.28 CRITERION= 0.1593
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1192 CRITERION= 0.1340 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 4 COMPLETED. CUM ITER = 524

*** TIME = 0.347134E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5625E-05 OSCILLATION LIMIT = 44.38

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.43 CRITERION= 0.1588
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1187 CRITERION= 0.1336 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 5 COMPLETED. CUM ITER = 525

*** TIME = 0.355023E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5662E-05 OSCILLATION LIMIT = 44.67

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.27 CRITERION= 0.1585
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1181 CRITERION= 0.1330 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 6 COMPLETED. CUM ITER = 526

*** TIME = 0.362912E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5622E-05 OSCILLATION LIMIT = 44.35

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.42 CRITERION= 0.1580
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1177 CRITERION= 0.1326 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 7 COMPLETED. CUM ITER = 527

*** TIME = 0.370802E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5656E-05 OSCILLATION LIMIT = 44.62

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.26 CRITERION= 0.1576
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1171 CRITERION= 0.1320 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 8 COMPLETED. CUM ITER = 528

*** TIME = 0.378691E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5618E-05 OSCILLATION LIMIT = 44.33

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.41 CRITERION= 0.1572
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1167 CRITERION= 0.1316 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 9 COMPLETED. CUM ITER = 529

*** TIME = 0.386581E+09 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.5651E-05 OSCILLATION LIMIT = 44.58

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.26 CRITERION= 0.1568
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1161 CRITERION= 0.1310 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 10 COMPLETED. CUM ITER = 530

*** TIME = 0.394470E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5614E-05 OSCILLATION LIMIT = 44.29
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.40 CRITERION= 0.1564
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1157 CRITERION= 0.1306 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 11 COMPLETED. CUM ITER = 531
 *** TIME = 0.402359E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5645E-05 OSCILLATION LIMIT = 44.54
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.25 CRITERION= 0.1560
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1151 CRITERION= 0.1301 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 12 COMPLETED. CUM ITER = 532
 *** TIME = 0.410249E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5610E-05 OSCILLATION LIMIT = 44.26
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.40 CRITERION= 0.1555
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1147 CRITERION= 0.1297 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 13 COMPLETED. CUM ITER = 533
 *** TIME = 0.418138E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5640E-05 OSCILLATION LIMIT = 44.49
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.24 CRITERION= 0.1552
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1141 CRITERION= 0.1291 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 14 COMPLETED. CUM ITER = 534
 *** TIME = 0.426028E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5606E-05 OSCILLATION LIMIT = 44.23
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.39 CRITERION= 0.1547
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1137 CRITERION= 0.1287 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 15 COMPLETED. CUM ITER = 535
 *** TIME = 0.433917E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5634E-05 OSCILLATION LIMIT = 44.45
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.23 CRITERION= 0.1543
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1131 CRITERION= 0.1281 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 16 COMPLETED. CUM ITER = 536
 *** TIME = 0.441806E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5602E-05 OSCILLATION LIMIT = 44.19
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.38 CRITERION= 0.1539
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1127 CRITERION= 0.1277 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 23 SUBSTEP 17 COMPLETED. CUM ITER = 537
 *** TIME = 0.449696E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5628E-05 OSCILLATION LIMIT = 44.40
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.23 CRITERION= 0.1535
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1122 CRITERION= 0.1271 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 18 COMPLETED. CUM ITER = 538
*** TIME = 0.457585E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5597E-05 OSCILLATION LIMIT = 44.16
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.38 CRITERION= 0.1531
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1117 CRITERION= 0.1267 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 19 COMPLETED. CUM ITER = 539
*** TIME = 0.465475E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5622E-05 OSCILLATION LIMIT = 44.36
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.22 CRITERION= 0.1527
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1112 CRITERION= 0.1261 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 20 COMPLETED. CUM ITER = 540
*** TIME = 0.473364E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5592E-05 OSCILLATION LIMIT = 44.12
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.37 CRITERION= 0.1523
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1107 CRITERION= 0.1257 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 21 COMPLETED. CUM ITER = 541
*** TIME = 0.481253E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5616E-05 OSCILLATION LIMIT = 44.31
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.21 CRITERION= 0.1519
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1102 CRITERION= 0.1252 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 22 COMPLETED. CUM ITER = 542
*** TIME = 0.489143E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5587E-05 OSCILLATION LIMIT = 44.08
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.36 CRITERION= 0.1514
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1098 CRITERION= 0.1248 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 23 COMPLETED. CUM ITER = 543
*** TIME = 0.497032E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5610E-05 OSCILLATION LIMIT = 44.26
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.20 CRITERION= 0.1511
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1092 CRITERION= 0.1242 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 24 COMPLETED. CUM ITER = 544
*** TIME = 0.504922E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5582E-05 OSCILLATION LIMIT = 44.04
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.35 CRITERION= 0.1506
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
HT FLOW CONVERGENCE VALUE= 0.1088 CRITERION= 0.1238 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 23 SUBSTEP 25 COMPLETED. CUM ITER = 545
*** TIME = 0.512811E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.5604E-05 OSCILLATION LIMIT = 44.21
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.20 CRITERION= 0.1503

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1083 CRITERION= 0.1232 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 26 COMPLETED. CUM ITER = 546
 *** TIME = 0.520700E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5577E-05 OSCILLATION LIMIT = 44.00
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.35 CRITERION= 0.1498
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1081 CRITERION= 0.1228 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 27 COMPLETED. CUM ITER = 547
 *** TIME = 0.528590E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5597E-05 OSCILLATION LIMIT = 44.16
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.19 CRITERION= 0.1495
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1074 CRITERION= 0.1222 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 28 COMPLETED. CUM ITER = 548
 *** TIME = 0.536479E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5571E-05 OSCILLATION LIMIT = 43.95
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.34 CRITERION= 0.1490
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1068 CRITERION= 0.1218 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 29 COMPLETED. CUM ITER = 549
 *** TIME = 0.544369E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5589E-05 OSCILLATION LIMIT = 44.10
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.18 CRITERION= 0.1486
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1060 CRITERION= 0.1213 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 30 COMPLETED. CUM ITER = 550
 *** TIME = 0.552258E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5564E-05 OSCILLATION LIMIT = 43.89
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.33 CRITERION= 0.1482
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1050 CRITERION= 0.1209 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 31 COMPLETED. CUM ITER = 551
 *** TIME = 0.560147E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5581E-05 OSCILLATION LIMIT = 44.03
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.17 CRITERION= 0.1478
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1044 CRITERION= 0.1203 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 32 COMPLETED. CUM ITER = 552
 *** TIME = 0.568037E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5556E-05 OSCILLATION LIMIT = 43.84
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.32 CRITERION= 0.1474
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1044 CRITERION= 0.1199 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 33 COMPLETED. CUM ITER = 553
 *** TIME = 0.575926E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5572E-05 OSCILLATION LIMIT = 43.96
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.17 CRITERION= 0.1470
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1035 CRITERION= 0.1193 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 34 COMPLETED. CUM ITER = 554
 *** TIME = 0.583816E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5548E-05 OSCILLATION LIMIT = 43.77
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.32 CRITERION= 0.1466
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.1013 CRITERION= 0.1189 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 35 COMPLETED. CUM ITER = 555
 *** TIME = 0.591705E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5561E-05 OSCILLATION LIMIT = 43.87
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.16 CRITERION= 0.1462
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.9973E-01 CRITERION= 0.1183 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 36 COMPLETED. CUM ITER = 556
 *** TIME = 0.599594E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5538E-05 OSCILLATION LIMIT = 43.70
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.31 CRITERION= 0.1458
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.9933E-01 CRITERION= 0.1179 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 37 COMPLETED. CUM ITER = 557
 *** TIME = 0.607484E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5552E-05 OSCILLATION LIMIT = 43.80
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.15 CRITERION= 0.1454
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.9886E-01 CRITERION= 0.1173 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 38 COMPLETED. CUM ITER = 558
 *** TIME = 0.615373E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5532E-05 OSCILLATION LIMIT = 43.64
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.30 CRITERION= 0.1450
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.9844E-01 CRITERION= 0.1169 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 39 COMPLETED. CUM ITER = 559
 *** TIME = 0.623263E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5545E-05 OSCILLATION LIMIT = 43.75
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 85.15 CRITERION= 0.1446
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2991
 HT FLOW CONVERGENCE VALUE= 0.9797E-01 CRITERION= 0.1164 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 23 SUBSTEP 40 COMPLETED. CUM ITER = 560
 *** TIME = 0.631152E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.5526E-05 OSCILLATION LIMIT = 43.59

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 17:21:07 JUN 26, 1996 CP= 24918.970
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 55.92 CRITERION= 0.1291
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6395E-01 CRITERION= 0.1161 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 1 COMPLETED. CUM ITER = 561
 *** TIME = 0.639041E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.7062E-05 OSCILLATION LIMIT = 55.71
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.76 CRITERION= 0.1288
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6349E-01 CRITERION= 0.1156 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 2 COMPLETED. CUM ITER = 562
 *** TIME = 0.646931E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6769E-05 OSCILLATION LIMIT = 53.40
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.91 CRITERION= 0.1284
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6335E-01 CRITERION= 0.1154 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 3 COMPLETED. CUM ITER = 563
 *** TIME = 0.654820E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6765E-05 OSCILLATION LIMIT = 53.38
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.76 CRITERION= 0.1281
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6309E-01 CRITERION= 0.1149 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 4 COMPLETED. CUM ITER = 564
 *** TIME = 0.662710E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6818E-05 OSCILLATION LIMIT = 53.79
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.91 CRITERION= 0.1277
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6291E-01 CRITERION= 0.1146 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 5 COMPLETED. CUM ITER = 565
 *** TIME = 0.670599E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6764E-05 OSCILLATION LIMIT = 53.37
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.75 CRITERION= 0.1275
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6265E-01 CRITERION= 0.1142 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 6 COMPLETED. CUM ITER = 566
 *** TIME = 0.678488E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6814E-05 OSCILLATION LIMIT = 53.76
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.91 CRITERION= 0.1271
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6248E-01 CRITERION= 0.1139 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 7 COMPLETED. CUM ITER = 567
 *** TIME = 0.686378E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6764E-05 OSCILLATION LIMIT = 53.36
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.75 CRITERION= 0.1268
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6222E-01 CRITERION= 0.1135 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1


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*** LOAD STEP 24 SUBSTEP 8 COMPLETED. CUM ITER = 568
*** TIME = 0.694267E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6810E-05 OSCILLATION LIMIT = 53.73
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.90 CRITERION= 0.1264
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6205E-01 CRITERION= 0.1132 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 9 COMPLETED. CUM ITER = 569
*** TIME = 0.702157E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6763E-05 OSCILLATION LIMIT = 53.36
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.75 CRITERION= 0.1262
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6179E-01 CRITERION= 0.1127 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 10 COMPLETED. CUM ITER = 570
*** TIME = 0.710046E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6806E-05 OSCILLATION LIMIT = 53.70
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.90 CRITERION= 0.1258
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6162E-01 CRITERION= 0.1125 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 11 COMPLETED. CUM ITER = 571
*** TIME = 0.717935E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6762E-05 OSCILLATION LIMIT = 53.35
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.74 CRITERION= 0.1255
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6136E-01 CRITERION= 0.1120 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 12 COMPLETED. CUM ITER = 572
*** TIME = 0.725825E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6802E-05 OSCILLATION LIMIT = 53.67
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.90 CRITERION= 0.1251
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6119E-01 CRITERION= 0.1118 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 13 COMPLETED. CUM ITER = 573
*** TIME = 0.733714E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6761E-05 OSCILLATION LIMIT = 53.34
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.74 CRITERION= 0.1249
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6093E-01 CRITERION= 0.1113 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 14 COMPLETED. CUM ITER = 574
*** TIME = 0.741604E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6798E-05 OSCILLATION LIMIT = 53.63
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.89 CRITERION= 0.1245
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
HT FLOW CONVERGENCE VALUE= 0.6076E-01 CRITERION= 0.1110 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 24 SUBSTEP 15 COMPLETED. CUM ITER = 575
*** TIME = 0.749493E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.6759E-05 OSCILLATION LIMIT = 53.33
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.74 CRITERION= 0.1242
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964

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HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1216
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5879E-01 CRITERION= 0.1077 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 24 COMPLETED. CUM ITER = 584
 *** TIME = 0.820498E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6779E-05 OSCILLATION LIMIT = 53.48
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.88 CRITERION= 0.1213
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5862E-01 CRITERION= 0.1074 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 25 COMPLETED. CUM ITER = 585
 *** TIME = 0.828387E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6750E-05 OSCILLATION LIMIT = 53.26
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1210
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5836E-01 CRITERION= 0.1070 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 26 COMPLETED. CUM ITER = 586
 *** TIME = 0.836276E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6775E-05 OSCILLATION LIMIT = 53.45
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1206
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5820E-01 CRITERION= 0.1067 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 27 COMPLETED. CUM ITER = 587
 *** TIME = 0.844166E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6748E-05 OSCILLATION LIMIT = 53.24
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1204
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5794E-01 CRITERION= 0.1063 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 28 COMPLETED. CUM ITER = 588
 *** TIME = 0.852055E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6771E-05 OSCILLATION LIMIT = 53.42
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1200
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5777E-01 CRITERION= 0.1060 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 29 COMPLETED. CUM ITER = 589
 *** TIME = 0.859945E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6746E-05 OSCILLATION LIMIT = 53.22
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.71 CRITERION= 0.1197
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5751E-01 CRITERION= 0.1055 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 30 COMPLETED. CUM ITER = 590
 *** TIME = 0.867834E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6767E-05 OSCILLATION LIMIT = 53.39
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1194
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5735E-01 CRITERION= 0.1053 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 31 COMPLETED. CUM ITER = 591
 *** TIME = 0.875723E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6743E-05 OSCILLATION LIMIT = 53.20

HT FLOW CONVERGENCE VALUE= 0.6050E-01 CRITERION= 0.1106 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 16 COMPLETED. CUM ITER = 576
 *** TIME = 0.757382E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6794E-05 OSCILLATION LIMIT = 53.60
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.89 CRITERION= 0.1239
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6033E-01 CRITERION= 0.1103 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 17 COMPLETED. CUM ITER = 577
 *** TIME = 0.765272E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6758E-05 OSCILLATION LIMIT = 53.32
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.73 CRITERION= 0.1236
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.6007E-01 CRITERION= 0.1099 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 18 COMPLETED. CUM ITER = 578
 *** TIME = 0.773161E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6791E-05 OSCILLATION LIMIT = 53.57
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.89 CRITERION= 0.1232
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5990E-01 CRITERION= 0.1096 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 19 COMPLETED. CUM ITER = 579
 *** TIME = 0.781051E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6756E-05 OSCILLATION LIMIT = 53.30
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.73 CRITERION= 0.1229
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5964E-01 CRITERION= 0.1091 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 20 COMPLETED. CUM ITER = 580
 *** TIME = 0.788940E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6787E-05 OSCILLATION LIMIT = 53.54
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.88 CRITERION= 0.1226
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5948E-01 CRITERION= 0.1089 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 21 COMPLETED. CUM ITER = 581
 *** TIME = 0.796829E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6754E-05 OSCILLATION LIMIT = 53.29
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.73 CRITERION= 0.1223
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5921E-01 CRITERION= 0.1084 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 22 COMPLETED. CUM ITER = 582
 *** TIME = 0.804719E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6783E-05 OSCILLATION LIMIT = 53.51
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.88 CRITERION= 0.1219
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5905E-01 CRITERION= 0.1081 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 23 COMPLETED. CUM ITER = 583
 *** TIME = 0.812608E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6753E-05 OSCILLATION LIMIT = 53.27
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1216
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5879E-01 CRITERION= 0.1077 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 24 COMPLETED. CUM ITER = 584
 *** TIME = 0.820498E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6779E-05 OSCILLATION LIMIT = 53.48
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.88 CRITERION= 0.1213
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5862E-01 CRITERION= 0.1074 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 25 COMPLETED. CUM ITER = 585
 *** TIME = 0.828387E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6750E-05 OSCILLATION LIMIT = 53.26
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1210
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5836E-01 CRITERION= 0.1070 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 26 COMPLETED. CUM ITER = 586
 *** TIME = 0.836276E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6775E-05 OSCILLATION LIMIT = 53.45
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1206
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5820E-01 CRITERION= 0.1067 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 27 COMPLETED. CUM ITER = 587
 *** TIME = 0.844166E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6748E-05 OSCILLATION LIMIT = 53.24
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.72 CRITERION= 0.1204
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5794E-01 CRITERION= 0.1063 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 28 COMPLETED. CUM ITER = 588
 *** TIME = 0.852055E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6771E-05 OSCILLATION LIMIT = 53.42
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1200
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5777E-01 CRITERION= 0.1060 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 29 COMPLETED. CUM ITER = 589
 *** TIME = 0.859945E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6746E-05 OSCILLATION LIMIT = 53.22
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.71 CRITERION= 0.1197
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5751E-01 CRITERION= 0.1055 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 30 COMPLETED. CUM ITER = 590
 *** TIME = 0.867834E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6767E-05 OSCILLATION LIMIT = 53.39
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.87 CRITERION= 0.1194
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5735E-01 CRITERION= 0.1053 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 31 COMPLETED. CUM ITER = 591
 *** TIME = 0.875723E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6743E-05 OSCILLATION LIMIT = 53.20

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.71 CRITERION= 0.1191
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5709E-01 CRITERION= 0.1048 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 32 COMPLETED. CUM ITER = 592
 *** TIME = 0.883613E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6763E-05 OSCILLATION LIMIT = 53.35
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.86 CRITERION= 0.1187
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5693E-01 CRITERION= 0.1045 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 33 COMPLETED. CUM ITER = 593
 *** TIME = 0.891502E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6741E-05 OSCILLATION LIMIT = 53.18
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.71 CRITERION= 0.1185
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5667E-01 CRITERION= 0.1041 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 34 COMPLETED. CUM ITER = 594
 *** TIME = 0.899392E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6758E-05 OSCILLATION LIMIT = 53.32
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.86 CRITERION= 0.1181
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5651E-01 CRITERION= 0.1038 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 35 COMPLETED. CUM ITER = 595
 *** TIME = 0.907281E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6738E-05 OSCILLATION LIMIT = 53.16
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.70 CRITERION= 0.1178
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5625E-01 CRITERION= 0.1034 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 36 COMPLETED. CUM ITER = 596
 *** TIME = 0.915170E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6754E-05 OSCILLATION LIMIT = 53.29
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.86 CRITERION= 0.1175
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5608E-01 CRITERION= 0.1031 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 37 COMPLETED. CUM ITER = 597
 *** TIME = 0.923060E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6735E-05 OSCILLATION LIMIT = 53.13
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.70 CRITERION= 0.1172
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5583E-01 CRITERION= 0.1027 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 38 COMPLETED. CUM ITER = 598
 *** TIME = 0.930949E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6750E-05 OSCILLATION LIMIT = 53.25
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.85 CRITERION= 0.1168
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5566E-01 CRITERION= 0.1024 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 39 COMPLETED. CUM ITER = 599

*** TIME = 0.938839E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6732E-05 OSCILLATION LIMIT = 53.11
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.70 CRITERION= 0.1165
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1964
 HT FLOW CONVERGENCE VALUE= 0.5541E-01 CRITERION= 0.1019 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 24 SUBSTEP 40 COMPLETED. CUM ITER = 600
 *** TIME = 0.946728E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.6746E-05 OSCILLATION LIMIT = 53.22

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 17:54:05 JUN 26, 1996 CP= 26807.290
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1035
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1181
 HT FLOW CONVERGENCE VALUE= 0.3072E-01 CRITERION= 0.1018 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 1 COMPLETED. CUM ITER = 601
 *** TIME = 0.954617E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1248E-04 OSCILLATION LIMIT = 98.46
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1033
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1057
 HT FLOW CONVERGENCE VALUE= 0.2753E-01 CRITERION= 0.1014 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 2 COMPLETED. CUM ITER = 602
 *** TIME = 0.962507E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1366E-04 OSCILLATION LIMIT = 107.7
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1030
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1036
 HT FLOW CONVERGENCE VALUE= 0.2679E-01 CRITERION= 0.1012 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 3 COMPLETED. CUM ITER = 603
 *** TIME = 0.970396E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1388E-04 OSCILLATION LIMIT = 109.5
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1028
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1063
 HT FLOW CONVERGENCE VALUE= 0.2741E-01 CRITERION= 0.1008 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 4 COMPLETED. CUM ITER = 604
 *** TIME = 0.978286E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1374E-04 OSCILLATION LIMIT = 108.4
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1024
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1037
 HT FLOW CONVERGENCE VALUE= 0.2667E-01 CRITERION= 0.1007 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 5 COMPLETED. CUM ITER = 605
 *** TIME = 0.986175E+09 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1388E-04 OSCILLATION LIMIT = 109.5
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1022
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1062
 HT FLOW CONVERGENCE VALUE= 0.2725E-01 CRITERION= 0.1003 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 6 COMPLETED. CUM ITER = 606
*** TIME = 0.994064E+09 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1375E-04 OSCILLATION LIMIT = 108.5
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1019
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1038
HT FLOW CONVERGENCE VALUE= 0.2654E-01 CRITERION= 0.1001 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 7 COMPLETED. CUM ITER = 607
*** TIME = 0.100195E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1389E-04 OSCILLATION LIMIT = 109.6
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1017
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1062
HT FLOW CONVERGENCE VALUE= 0.2708E-01 CRITERION= 0.9976E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 8 COMPLETED. CUM ITER = 608
*** TIME = 0.100984E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1376E-04 OSCILLATION LIMIT = 108.6
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1014
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1039
HT FLOW CONVERGENCE VALUE= 0.2642E-01 CRITERION= 0.9959E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 9 COMPLETED. CUM ITER = 609
*** TIME = 0.101773E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1390E-04 OSCILLATION LIMIT = 109.6
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1012
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1061
HT FLOW CONVERGENCE VALUE= 0.2697E-01 CRITERION= 0.9923E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 10 COMPLETED. CUM ITER = 610
*** TIME = 0.102562E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1377E-04 OSCILLATION LIMIT = 108.7
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1008
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1040
HT FLOW CONVERGENCE VALUE= 0.2644E-01 CRITERION= 0.9906E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 11 COMPLETED. CUM ITER = 611
*** TIME = 0.103351E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1391E-04 OSCILLATION LIMIT = 109.7
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1007
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1060
HT FLOW CONVERGENCE VALUE= 0.2695E-01 CRITERION= 0.9869E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 12 COMPLETED. CUM ITER = 612
*** TIME = 0.104140E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1379E-04 OSCILLATION LIMIT = 108.8
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.1003
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1041
HT FLOW CONVERGENCE VALUE= 0.2633E-01 CRITERION= 0.9852E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 13 COMPLETED. CUM ITER = 613
*** TIME = 0.104929E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1392E-04 OSCILLATION LIMIT = 109.8
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.1001

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1060
HT FLOW CONVERGENCE VALUE= 0.2679E-01 CRITERION= 0.9815E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 14 COMPLETED. CUM ITER = 614
*** TIME = 0.105718E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1380E-04 OSCILLATION LIMIT = 108.8
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9978E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1041
HT FLOW CONVERGENCE VALUE= 0.2621E-01 CRITERION= 0.9798E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 15 COMPLETED. CUM ITER = 615
*** TIME = 0.106507E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1392E-04 OSCILLATION LIMIT = 109.9
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9960E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1059
HT FLOW CONVERGENCE VALUE= 0.2669E-01 CRITERION= 0.9761E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 16 COMPLETED. CUM ITER = 616
*** TIME = 0.107296E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1381E-04 OSCILLATION LIMIT = 108.9
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9925E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1042
HT FLOW CONVERGENCE VALUE= 0.2623E-01 CRITERION= 0.9744E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 17 COMPLETED. CUM ITER = 617
*** TIME = 0.108085E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1393E-04 OSCILLATION LIMIT = 109.9
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9907E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1058
HT FLOW CONVERGENCE VALUE= 0.2670E-01 CRITERION= 0.9707E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 18 COMPLETED. CUM ITER = 618
*** TIME = 0.108874E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1382E-04 OSCILLATION LIMIT = 109.0
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9872E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1043
HT FLOW CONVERGENCE VALUE= 0.2622E-01 CRITERION= 0.9690E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 19 COMPLETED. CUM ITER = 619
*** TIME = 0.109663E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1394E-04 OSCILLATION LIMIT = 110.0
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9854E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1058
HT FLOW CONVERGENCE VALUE= 0.2664E-01 CRITERION= 0.9653E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 20 COMPLETED. CUM ITER = 620
*** TIME = 0.110452E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1383E-04 OSCILLATION LIMIT = 109.1
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9819E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1044
HT FLOW CONVERGENCE VALUE= 0.2614E-01 CRITERION= 0.9636E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 25 SUBSTEP 21 COMPLETED. CUM ITER = 621
*** TIME = 0.111241E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1395E-04 OSCILLATION LIMIT = 110.1
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9801E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1057
 HT FLOW CONVERGENCE VALUE= 0.2655E-01 CRITERION= 0.9599E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 22 COMPLETED. CUM ITER = 622
 *** TIME = 0.112029E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1384E-04 OSCILLATION LIMIT = 109.2
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9766E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1044
 HT FLOW CONVERGENCE VALUE= 0.2606E-01 CRITERION= 0.9582E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 23 COMPLETED. CUM ITER = 623
 *** TIME = 0.112818E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1396E-04 OSCILLATION LIMIT = 110.1
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9748E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1057
 HT FLOW CONVERGENCE VALUE= 0.2642E-01 CRITERION= 0.9546E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 24 COMPLETED. CUM ITER = 624
 *** TIME = 0.113607E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1385E-04 OSCILLATION LIMIT = 109.3
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9713E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1045
 HT FLOW CONVERGENCE VALUE= 0.2596E-01 CRITERION= 0.9528E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 25 COMPLETED. CUM ITER = 625
 *** TIME = 0.114396E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1397E-04 OSCILLATION LIMIT = 110.2
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9695E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1057
 HT FLOW CONVERGENCE VALUE= 0.2628E-01 CRITERION= 0.9492E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 26 COMPLETED. CUM ITER = 626
 *** TIME = 0.115185E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1386E-04 OSCILLATION LIMIT = 109.4
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.14 CRITERION= 0.9660E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1046
 HT FLOW CONVERGENCE VALUE= 0.2583E-01 CRITERION= 0.9475E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 27 COMPLETED. CUM ITER = 627
 *** TIME = 0.115974E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1398E-04 OSCILLATION LIMIT = 110.3
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9642E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1056
 HT FLOW CONVERGENCE VALUE= 0.2613E-01 CRITERION= 0.9438E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 28 COMPLETED. CUM ITER = 628
 *** TIME = 0.116763E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1388E-04 OSCILLATION LIMIT = 109.5
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9607E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1046
 HT FLOW CONVERGENCE VALUE= 0.2570E-01 CRITERION= 0.9421E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 29 COMPLETED. CUM ITER = 629
 *** TIME = 0.117552E+10 TIME INC = 0.788940E+07

*** RESPONSE EIGENVALUE = 0.1399E-04 OSCILLATION LIMIT = 110.3
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9589E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1056
 HT FLOW CONVERGENCE VALUE= 0.2598E-01 CRITERION= 0.9384E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 30 COMPLETED. CUM ITER = 630
 *** TIME = 0.118341E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1389E-04 OSCILLATION LIMIT = 109.6
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9555E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1047
 HT FLOW CONVERGENCE VALUE= 0.2557E-01 CRITERION= 0.9367E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 31 COMPLETED. CUM ITER = 631
 *** TIME = 0.119130E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1400E-04 OSCILLATION LIMIT = 110.4
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9536E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1056
 HT FLOW CONVERGENCE VALUE= 0.2582E-01 CRITERION= 0.9330E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 32 COMPLETED. CUM ITER = 632
 *** TIME = 0.119919E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1390E-04 OSCILLATION LIMIT = 109.6
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9502E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1047
 HT FLOW CONVERGENCE VALUE= 0.2542E-01 CRITERION= 0.9313E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 33 COMPLETED. CUM ITER = 633
 *** TIME = 0.120708E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1400E-04 OSCILLATION LIMIT = 110.5
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9483E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1055
 HT FLOW CONVERGENCE VALUE= 0.2566E-01 CRITERION= 0.9276E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 34 COMPLETED. CUM ITER = 634
 *** TIME = 0.121497E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1391E-04 OSCILLATION LIMIT = 109.7
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9449E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1048
 HT FLOW CONVERGENCE VALUE= 0.2528E-01 CRITERION= 0.9259E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 35 COMPLETED. CUM ITER = 635
 *** TIME = 0.122286E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1401E-04 OSCILLATION LIMIT = 110.6
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9430E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1055
 HT FLOW CONVERGENCE VALUE= 0.2550E-01 CRITERION= 0.9222E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 36 COMPLETED. CUM ITER = 636
 *** TIME = 0.123075E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1392E-04 OSCILLATION LIMIT = 109.8
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9396E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1048
 HT FLOW CONVERGENCE VALUE= 0.2514E-01 CRITERION= 0.9205E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 25 SUBSTEP 37 COMPLETED. CUM ITER = 637
 *** TIME = 0.123864E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1402E-04 OSCILLATION LIMIT = 110.6
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9377E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1055
 HT FLOW CONVERGENCE VALUE= 0.2537E-01 CRITERION= 0.9169E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 38 COMPLETED. CUM ITER = 638
 *** TIME = 0.124653E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1393E-04 OSCILLATION LIMIT = 109.9
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 18.13 CRITERION= 0.9343E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1049
 HT FLOW CONVERGENCE VALUE= 0.2502E-01 CRITERION= 0.9151E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 39 COMPLETED. CUM ITER = 639
 *** TIME = 0.125441E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1403E-04 OSCILLATION LIMIT = 110.7
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 17.98 CRITERION= 0.9325E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1054
 HT FLOW CONVERGENCE VALUE= 0.2521E-01 CRITERION= 0.9115E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 25 SUBSTEP 40 COMPLETED. CUM ITER = 640
 *** TIME = 0.126230E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1394E-04 OSCILLATION LIMIT = 110.0

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 18:26:58 JUN 26, 1996 CP= 28693.050
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.9124E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1092
 HT FLOW CONVERGENCE VALUE= 0.2447E-01 CRITERION= 0.9104E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 26 SUBSTEP 1 COMPLETED. CUM ITER = 641
 *** TIME = 0.127019E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.9329E-05 OSCILLATION LIMIT = 73.60
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.333 CRITERION= 0.9112E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1059
 HT FLOW CONVERGENCE VALUE= 0.2349E-01 CRITERION= 0.9073E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 26 SUBSTEP 2 COMPLETED. CUM ITER = 642
 *** TIME = 0.127808E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.9694E-05 OSCILLATION LIMIT = 76.48
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.9082E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1050
 HT FLOW CONVERGENCE VALUE= 0.2296E-01 CRITERION= 0.9063E-01 <<< CONVERGED

>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 26 SUBSTEP 3 COMPLETED. CUM ITER = 643
 *** TIME = 0.128597E+10 TIME INC = 0.788940E+07
 *** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 13.15 CRITERION= 0.9153E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3208
 HT FLOW CONVERGENCE VALUE= 0.6863E-01 CRITERION= 0.8995E-01 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 4 COMPLETED. CUM ITER = 644
*** TIME = 0.130964E+10 TIME INC = 0.236682E+08
*** RESPONSE EIGENVALUE = 0.1017E-04 OSCILLATION LIMIT = 240.6
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 4.491 CRITERION= 0.9004E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1020
HT FLOW CONVERGENCE VALUE= 0.2365E-01 CRITERION= 0.8981E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 5 COMPLETED. CUM ITER = 645
*** TIME = 0.131753E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.8775E-05 OSCILLATION LIMIT = 69.23
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8990E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1059
HT FLOW CONVERGENCE VALUE= 0.2314E-01 CRITERION= 0.8951E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 6 COMPLETED. CUM ITER = 646
*** TIME = 0.132542E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9734E-05 OSCILLATION LIMIT = 76.80
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8960E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1053
HT FLOW CONVERGENCE VALUE= 0.2269E-01 CRITERION= 0.8940E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 7 COMPLETED. CUM ITER = 647
*** TIME = 0.133331E+10 TIME INC = 0.788940E+07
*** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 13.15 CRITERION= 0.9032E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3212
HT FLOW CONVERGENCE VALUE= 0.6781E-01 CRITERION= 0.8872E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 8 COMPLETED. CUM ITER = 648
*** TIME = 0.135698E+10 TIME INC = 0.236682E+08
*** RESPONSE EIGENVALUE = 0.1016E-04 OSCILLATION LIMIT = 240.4
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 4.491 CRITERION= 0.8882E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1022
HT FLOW CONVERGENCE VALUE= 0.2337E-01 CRITERION= 0.8859E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 9 COMPLETED. CUM ITER = 649
*** TIME = 0.136487E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.8784E-05 OSCILLATION LIMIT = 69.30
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8868E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1060
HT FLOW CONVERGENCE VALUE= 0.2288E-01 CRITERION= 0.8829E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 10 COMPLETED. CUM ITER = 650
*** TIME = 0.137276E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9729E-05 OSCILLATION LIMIT = 76.75
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8838E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1055
HT FLOW CONVERGENCE VALUE= 0.2246E-01 CRITERION= 0.8818E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 11 COMPLETED. CUM ITER = 651
*** TIME = 0.138065E+10 TIME INC = 0.788940E+07
*** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 13.15 CRITERION= 0.8911E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3216
HT FLOW CONVERGENCE VALUE= 0.6732E-01 CRITERION= 0.8750E-01 <<< CONVERGED
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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 12 COMPLETED. CUM ITER = 652
*** TIME = 0.140431E+10 TIME INC = 0.236682E+08
*** RESPONSE EIGENVALUE = 0.1015E-04 OSCILLATION LIMIT = 240.2
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 4.491 CRITERION= 0.8760E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1024
HT FLOW CONVERGENCE VALUE= 0.2330E-01 CRITERION= 0.8737E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 13 COMPLETED. CUM ITER = 653
*** TIME = 0.141220E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.8792E-05 OSCILLATION LIMIT = 69.37
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8746E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1062
HT FLOW CONVERGENCE VALUE= 0.2287E-01 CRITERION= 0.8706E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 14 COMPLETED. CUM ITER = 654
*** TIME = 0.142009E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9723E-05 OSCILLATION LIMIT = 76.71
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8716E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1057
HT FLOW CONVERGENCE VALUE= 0.2246E-01 CRITERION= 0.8696E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 15 COMPLETED. CUM ITER = 655
*** TIME = 0.142798E+10 TIME INC = 0.788940E+07
*** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 13.15 CRITERION= 0.8790E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3221
HT FLOW CONVERGENCE VALUE= 0.6742E-01 CRITERION= 0.8628E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 16 COMPLETED. CUM ITER = 656
*** TIME = 0.145165E+10 TIME INC = 0.236682E+08
*** RESPONSE EIGENVALUE = 0.1014E-04 OSCILLATION LIMIT = 240.0
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 4.491 CRITERION= 0.8637E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1027
HT FLOW CONVERGENCE VALUE= 0.2331E-01 CRITERION= 0.8614E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 17 COMPLETED. CUM ITER = 657
*** TIME = 0.145954E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.8800E-05 OSCILLATION LIMIT = 69.43
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8623E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1063
HT FLOW CONVERGENCE VALUE= 0.2285E-01 CRITERION= 0.8584E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 18 COMPLETED. CUM ITER = 658
*** TIME = 0.146743E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9718E-05 OSCILLATION LIMIT = 76.67
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8594E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1059
HT FLOW CONVERGENCE VALUE= 0.2246E-01 CRITERION= 0.8573E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 19 COMPLETED. CUM ITER = 659
*** TIME = 0.147532E+10 TIME INC = 0.788940E+07
*** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 13.15 CRITERION= 0.8669E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3225
HT FLOW CONVERGENCE VALUE= 0.6709E-01 CRITERION= 0.8505E-01 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 20 COMPLETED. CUM ITER = 660
*** TIME = 0.149899E+10 TIME INC = 0.236682E+08
*** RESPONSE EIGENVALUE = 0.1013E-04 OSCILLATION LIMIT = 239.8
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 4.491 CRITERION= 0.8515E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1029
HT FLOW CONVERGENCE VALUE= 0.2306E-01 CRITERION= 0.8492E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 21 COMPLETED. CUM ITER = 661
*** TIME = 0.150688E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.8809E-05 OSCILLATION LIMIT = 69.50
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8501E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1065
HT FLOW CONVERGENCE VALUE= 0.2259E-01 CRITERION= 0.8462E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 22 COMPLETED. CUM ITER = 662
*** TIME = 0.151476E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9713E-05 OSCILLATION LIMIT = 76.63
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8471E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1061
HT FLOW CONVERGENCE VALUE= 0.2223E-01 CRITERION= 0.8451E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 23 COMPLETED. CUM ITER = 663
*** TIME = 0.152265E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9936E-05 OSCILLATION LIMIT = 78.39
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8460E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1067
HT FLOW CONVERGENCE VALUE= 0.2268E-01 CRITERION= 0.8421E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 24 COMPLETED. CUM ITER = 664
*** TIME = 0.153054E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9688E-05 OSCILLATION LIMIT = 76.44
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8431E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1062
HT FLOW CONVERGENCE VALUE= 0.2228E-01 CRITERION= 0.8410E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 25 COMPLETED. CUM ITER = 665
*** TIME = 0.153843E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9931E-05 OSCILLATION LIMIT = 78.35
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8420E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1067
HT FLOW CONVERGENCE VALUE= 0.2268E-01 CRITERION= 0.8380E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 26 COMPLETED. CUM ITER = 666
*** TIME = 0.154632E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9689E-05 OSCILLATION LIMIT = 76.44
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8390E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1063
HT FLOW CONVERGENCE VALUE= 0.2230E-01 CRITERION= 0.8369E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 27 COMPLETED. CUM ITER = 667
*** TIME = 0.155421E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9929E-05 OSCILLATION LIMIT = 78.33
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8379E-01

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1067
HT FLOW CONVERGENCE VALUE= 0.2267E-01 CRITERION= 0.8339E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 28 COMPLETED. CUM ITER = 668
*** TIME = 0.156210E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9689E-05 OSCILLATION LIMIT = 76.44
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.490 CRITERION= 0.8349E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1064
HT FLOW CONVERGENCE VALUE= 0.2227E-01 CRITERION= 0.8329E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 29 COMPLETED. CUM ITER = 669
*** TIME = 0.156999E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9926E-05 OSCILLATION LIMIT = 78.31
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 4.332 CRITERION= 0.8338E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1068
HT FLOW CONVERGENCE VALUE= 0.2257E-01 CRITERION= 0.8298E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 26 SUBSTEP 30 COMPLETED. CUM ITER = 670
*** TIME = 0.157788E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.9690E-05 OSCILLATION LIMIT = 76.45

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1' 24 *****
38303 VERSION=HP 9000/7XX 18:51:39 JUN 26, 1996 CP= 30107.630
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 1.660 CRITERION= 0.8299E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9918E-01
HT FLOW CONVERGENCE VALUE= 0.2212E-01 CRITERION= 0.8292E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 27 SUBSTEP 1 COMPLETED. CUM ITER = 671
*** TIME = 0.158577E+10 TIME INC = 0.788940E+07
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 1.816 CRITERION= 0.8292E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9795E-01
HT FLOW CONVERGENCE VALUE= 0.2189E-01 CRITERION= 0.8266E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 27 SUBSTEP 2 COMPLETED. CUM ITER = 672
*** TIME = 0.159366E+10 TIME INC = 0.788940E+07
*** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 5.132 CRITERION= 0.8278E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2999
HT FLOW CONVERGENCE VALUE= 0.6494E-01 CRITERION= 0.8230E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 27 SUBSTEP 3 COMPLETED. CUM ITER = 673
*** TIME = 0.161733E+10 TIME INC = 0.236682E+08
*** AUTO TIME STEP: NEXT TIME INC = 0.71005E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 15.71 CRITERION= 0.8365E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9011
HT FLOW CONVERGENCE VALUE= 0.1921 CRITERION= 0.8084E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2717E-01
HT FLOW CONVERGENCE VALUE= 0.3116E-02 CRITERION= 0.8074E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 4 COMPLETED. CUM ITER = 675
*** TIME = 0.168833E+10 TIME INC = 0.710046E+08
*** AUTO STEP TIME: NEXT TIME INC = 0.71005E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 15.55 CRITERION= 0.8210E-01

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9117
HT FLOW CONVERGENCE VALUE= 0.1899 CRITERION= 0.7950E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2673E-01
HT FLOW CONVERGENCE VALUE= 0.2999E-02 CRITERION= 0.7940E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 5 COMPLETED. CUM ITER = 677
*** TIME = 0.175934E+10 TIME INC = 0.710046E+08
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+08 INCREASED (FACTOR = 1.1111)

HT FLOW CONVERGENCE VALUE= 17.44 CRITERION= 0.8115E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.016
HT FLOW CONVERGENCE VALUE= 0.2084 CRITERION= 0.7782E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2926E-01
HT FLOW CONVERGENCE VALUE= 0.3213E-02 CRITERION= 0.7771E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 6 COMPLETED. CUM ITER = 679
*** TIME = 0.183823E+10 TIME INC = 0.788940E+08
*** AUTO TIME STEP: NEXT TIME INC = 0.55226E+08 DECREASED (FACTOR = 0.7000)

HT FLOW CONVERGENCE VALUE= 12.08 CRITERION= 0.7855E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7121
HT FLOW CONVERGENCE VALUE= 0.1442 CRITERION= 0.7677E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2048E-01
HT FLOW CONVERGENCE VALUE= 0.2212E-02 CRITERION= 0.7670E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 27 SUBSTEP 7 COMPLETED. CUM ITER = 681
*** TIME = 0.189346E+10 TIME INC = 0.552258E+08

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***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 18:59:24 JUN 26, 1996 CP= 30538.450
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

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40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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HT FLOW CONVERGENCE VALUE= 41.11 CRITERION= 0.8693E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6585
HT FLOW CONVERGENCE VALUE= 0.1428 CRITERION= 0.7578E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2682E-01
HT FLOW CONVERGENCE VALUE= 0.3560E-02 CRITERION= 0.7573E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 28 SUBSTEP 1 COMPLETED. CUM ITER = 683
*** TIME = 0.194868E+10 TIME INC = 0.552258E+08
*** AUTO STEP TIME: NEXT TIME INC = 0.55226E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 40.95 CRITERION= 0.8604E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6594
HT FLOW CONVERGENCE VALUE= 0.1411 CRITERION= 0.7501E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2659E-01
HT FLOW CONVERGENCE VALUE= 0.3489E-02 CRITERION= 0.7495E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 28 SUBSTEP 2 COMPLETED. CUM ITER = 685
*** TIME = 0.200391E+10 TIME INC = 0.552258E+08
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+08 INCREASED (FACTOR = 1.4286)

HT FLOW CONVERGENCE VALUE= 58.69 CRITERION= 0.9509E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9439
HT FLOW CONVERGENCE VALUE= 0.1986 CRITERION= 0.7369E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3736E-01
HT FLOW CONVERGENCE VALUE= 0.4790E-02 CRITERION= 0.7361E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 28 SUBSTEP 3 COMPLETED. CUM ITER = 687
*** TIME = 0.208280E+10 TIME INC = 0.788940E+08
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 58.53 CRITERION= 0.9399E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9455

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HT FLOW CONVERGENCE VALUE= 0.1954 CRITERION= 0.7255E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3691E-01
 HT FLOW CONVERGENCE VALUE= 0.4648E-02 CRITERION= 0.7247E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 28 SUBSTEP 4 COMPLETED. CUM ITER = 689
 *** TIME = 0.216170E+10 TIME INC = 0.788940E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+08 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 35.25 CRITERION= 0.8051E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5690
 HT FLOW CONVERGENCE VALUE= 0.1169 CRITERION= 0.7167E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2218E-01
 HT FLOW CONVERGENCE VALUE= 0.2773E-02 CRITERION= 0.7163E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 28 SUBSTEP 5 COMPLETED. CUM ITER = 691
 *** TIME = 0.220903E+10 TIME INC = 0.473364E+08

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 19:06:16 JUN 26, 1996 CP= 30901.590
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 66.77 CRITERION= 0.9790E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5894
 HT FLOW CONVERGENCE VALUE= 0.1329 CRITERION= 0.7115E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3057E-01
 HT FLOW CONVERGENCE VALUE= 0.4830E-02 CRITERION= 0.7111E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 29 SUBSTEP 1 COMPLETED. CUM ITER = 693
 *** TIME = 0.225637E+10 TIME INC = 0.473364E+08
 *** RESPONSE EIGENVALUE = 0.1810E-05 OSCILLATION LIMIT = 85.69
 *** AUTO TIME STEP: NEXT TIME INC = 0.15779E+08 DECREASED (FACTOR = 0.3333)

HT FLOW CONVERGENCE VALUE= 22.36 CRITERION= 0.7451E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.1975
 HT FLOW CONVERGENCE VALUE= 0.4461E-01 CRITERION= 0.7082E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 29 SUBSTEP 2 COMPLETED. CUM ITER = 694
 *** TIME = 0.227215E+10 TIME INC = 0.157788E+08
 *** RESPONSE EIGENVALUE = 0.1999E-05 OSCILLATION LIMIT = 31.55
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+07 DECREASED (FACTOR = 0.5000)

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7168E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8803E-01
 HT FLOW CONVERGENCE VALUE= 0.2064E-01 CRITERION= 0.7081E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 29 SUBSTEP 3 COMPLETED. CUM ITER = 695
 *** TIME = 0.228004E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1775E-05 OSCILLATION LIMIT = 14.00
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7168E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9355E-01
 HT FLOW CONVERGENCE VALUE= 0.2161E-01 CRITERION= 0.7061E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 29 SUBSTEP 4 COMPLETED. CUM ITER = 696
 *** TIME = 0.228793E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1850E-05 OSCILLATION LIMIT = 14.60
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7147E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9335E-01
 HT FLOW CONVERGENCE VALUE= 0.2132E-01 CRITERION= 0.7061E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 29 SUBSTEP 5 COMPLETED. CUM ITER = 697

*** TIME = 0.229582E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1918E-05 OSCILLATION LIMIT = 15.14
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7148E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9350E-01
 HT FLOW CONVERGENCE VALUE= 0.2156E-01 CRITERION= 0.7041E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 6 COMPLETED. CUM ITER = 698
 *** TIME = 0.230370E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.53
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7127E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9343E-01
 HT FLOW CONVERGENCE VALUE= 0.2127E-01 CRITERION= 0.7041E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 7 COMPLETED. CUM ITER = 699
 *** TIME = 0.231159E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1920E-05 OSCILLATION LIMIT = 15.14
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7128E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9352E-01
 HT FLOW CONVERGENCE VALUE= 0.2150E-01 CRITERION= 0.7021E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 8 COMPLETED. CUM ITER = 700
 *** TIME = 0.231948E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.53
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7107E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9350E-01
 HT FLOW CONVERGENCE VALUE= 0.2122E-01 CRITERION= 0.7020E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 9 COMPLETED. CUM ITER = 701
 *** TIME = 0.232737E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1921E-05 OSCILLATION LIMIT = 15.15
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7108E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9354E-01
 HT FLOW CONVERGENCE VALUE= 0.2144E-01 CRITERION= 0.7000E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 10 COMPLETED. CUM ITER = 702
 *** TIME = 0.233526E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7087E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9357E-01
 HT FLOW CONVERGENCE VALUE= 0.2117E-01 CRITERION= 0.7000E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 11 COMPLETED. CUM ITER = 703
 *** TIME = 0.234315E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1922E-05 OSCILLATION LIMIT = 15.16
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7088E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9357E-01
 HT FLOW CONVERGENCE VALUE= 0.2139E-01 CRITERION= 0.6980E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1

*** LOAD STEP 29 SUBSTEP 12 COMPLETED. CUM ITER = 704
 *** TIME = 0.235104E+10 TIME INC = 0.788940E+07
 *** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7067E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9364E-01
 HT FLOW CONVERGENCE VALUE= 0.2113E-01 CRITERION= 0.6979E-01 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 13 COMPLETED. CUM ITER = 705
*** TIME = 0.235893E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1923E-05 OSCILLATION LIMIT = 15.17
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7067E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9359E-01
HT FLOW CONVERGENCE VALUE= 0.2133E-01 CRITERION= 0.6959E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 14 COMPLETED. CUM ITER = 706
*** TIME = 0.236682E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7047E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9371E-01
HT FLOW CONVERGENCE VALUE= 0.2108E-01 CRITERION= 0.6959E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 15 COMPLETED. CUM ITER = 707
*** TIME = 0.237471E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1923E-05 OSCILLATION LIMIT = 15.17
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7047E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9362E-01
HT FLOW CONVERGENCE VALUE= 0.2127E-01 CRITERION= 0.6939E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 16 COMPLETED. CUM ITER = 708
*** TIME = 0.238260E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7026E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9378E-01
HT FLOW CONVERGENCE VALUE= 0.2103E-01 CRITERION= 0.6939E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 17 COMPLETED. CUM ITER = 709
*** TIME = 0.239049E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1924E-05 OSCILLATION LIMIT = 15.18
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7027E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9365E-01
HT FLOW CONVERGENCE VALUE= 0.2122E-01 CRITERION= 0.6919E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 18 COMPLETED. CUM ITER = 710
*** TIME = 0.239838E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.7006E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9385E-01
HT FLOW CONVERGENCE VALUE= 0.2098E-01 CRITERION= 0.6918E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 19 COMPLETED. CUM ITER = 711
*** TIME = 0.240627E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1925E-05 OSCILLATION LIMIT = 15.19
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.7007E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9368E-01
HT FLOW CONVERGENCE VALUE= 0.2116E-01 CRITERION= 0.6898E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 20 COMPLETED. CUM ITER = 712
*** TIME = 0.241416E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6986E-01

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EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9392E-01
HT FLOW CONVERGENCE VALUE= 0.2094E-01 CRITERION= 0.6898E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 21 COMPLETED. CUM ITER = 713
*** TIME = 0.242205E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1926E-05 OSCILLATION LIMIT = 15.19
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6987E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9371E-01
HT FLOW CONVERGENCE VALUE= 0.2111E-01 CRITERION= 0.6878E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 22 COMPLETED. CUM ITER = 714
*** TIME = 0.242994E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6966E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9398E-01
HT FLOW CONVERGENCE VALUE= 0.2089E-01 CRITERION= 0.6877E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 23 COMPLETED. CUM ITER = 715
*** TIME = 0.243782E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1927E-05 OSCILLATION LIMIT = 15.20
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6967E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9374E-01
HT FLOW CONVERGENCE VALUE= 0.2106E-01 CRITERION= 0.6857E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 24 COMPLETED. CUM ITER = 716
*** TIME = 0.244571E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6946E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9405E-01
HT FLOW CONVERGENCE VALUE= 0.2085E-01 CRITERION= 0.6857E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 25 COMPLETED. CUM ITER = 717
*** TIME = 0.245360E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1927E-05 OSCILLATION LIMIT = 15.21
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6947E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9378E-01
HT FLOW CONVERGENCE VALUE= 0.2100E-01 CRITERION= 0.6837E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 26 COMPLETED. CUM ITER = 718
*** TIME = 0.246149E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6926E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9411E-01
HT FLOW CONVERGENCE VALUE= 0.2080E-01 CRITERION= 0.6837E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 27 COMPLETED. CUM ITER = 719
*** TIME = 0.246938E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1928E-05 OSCILLATION LIMIT = 15.21
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6926E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9381E-01
HT FLOW CONVERGENCE VALUE= 0.2095E-01 CRITERION= 0.6817E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 28 COMPLETED. CUM ITER = 720
*** TIME = 0.247727E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

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HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6906E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9417E-01
HT FLOW CONVERGENCE VALUE= 0.2075E-01 CRITERION= 0.6816E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 29 COMPLETED. CUM ITER = 721
*** TIME = 0.248516E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1929E-05 OSCILLATION LIMIT = 15.22
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6906E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9385E-01
HT FLOW CONVERGENCE VALUE= 0.2089E-01 CRITERION= 0.6796E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 30 COMPLETED. CUM ITER = 722
*** TIME = 0.249305E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.52
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6886E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9424E-01
HT FLOW CONVERGENCE VALUE= 0.2070E-01 CRITERION= 0.6796E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 31 COMPLETED. CUM ITER = 723
*** TIME = 0.250094E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1929E-05 OSCILLATION LIMIT = 15.22
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6886E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9388E-01
HT FLOW CONVERGENCE VALUE= 0.2083E-01 CRITERION= 0.6776E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 32 COMPLETED. CUM ITER = 724
*** TIME = 0.250883E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.53
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.06 CRITERION= 0.6865E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9430E-01
HT FLOW CONVERGENCE VALUE= 0.2065E-01 CRITERION= 0.6775E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 33 COMPLETED. CUM ITER = 725
*** TIME = 0.251672E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1930E-05 OSCILLATION LIMIT = 15.23
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 11.22 CRITERION= 0.6866E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9392E-01
HT FLOW CONVERGENCE VALUE= 0.2078E-01 CRITERION= 0.6756E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 29 SUBSTEP 34 COMPLETED. CUM ITER = 726
*** TIME = 0.252461E+10 TIME INC = 0.788940E+07
*** RESPONSE EIGENVALUE = 0.1841E-05 OSCILLATION LIMIT = 14.53

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 19:34:43 JUN 26, 1996 CP= 32526.050
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 9.635 CRITERION= 0.6824E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7912E-01
HT FLOW CONVERGENCE VALUE= 0.1745E-01 CRITERION= 0.6757E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
*** LOAD STEP 30 SUBSTEP 1 COMPLETED. CUM ITER = 727
*** TIME = 0.253250E+10 TIME INC = 0.788940E+07

*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+07 UNCHANGED

HT FLOW CONVERGENCE VALUE= 9.793 CRITERION= 0.6826E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7896E-01
 HT FLOW CONVERGENCE VALUE= 0.1759E-01 CRITERION= 0.6739E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 30 SUBSTEP 2 COMPLETED. CUM ITER = 728
 *** TIME = 0.254039E+10 TIME INC = 0.788940E+07
 *** AUTO TIME STEP: NEXT TIME INC = 0.23668E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 29.06 CRITERION= 0.7338E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2471
 HT FLOW CONVERGENCE VALUE= 0.5355E-01 CRITERION= 0.6724E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 1
 *** LOAD STEP 30 SUBSTEP 3 COMPLETED. CUM ITER = 729
 *** TIME = 0.256406E+10 TIME INC = 0.236682E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.71005E+08 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 87.50 CRITERION= 0.1103
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7400
 HT FLOW CONVERGENCE VALUE= 0.1583 CRITERION= 0.6641E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3740E-01
 HT FLOW CONVERGENCE VALUE= 0.5623E-02 CRITERION= 0.6636E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 30 SUBSTEP 4 COMPLETED. CUM ITER = 731
 *** TIME = 0.263506E+10 TIME INC = 0.710046E+08
 *** AUTO STEP TIME: NEXT TIME INC = 0.71005E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 87.35 CRITERION= 0.1097
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7551
 HT FLOW CONVERGENCE VALUE= 0.1584 CRITERION= 0.6575E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3718E-01
 HT FLOW CONVERGENCE VALUE= 0.5501E-02 CRITERION= 0.6570E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 30 SUBSTEP 5 COMPLETED. CUM ITER = 733
 *** TIME = 0.270606E+10 TIME INC = 0.710046E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+08 INCREASED (FACTOR = 1.1111)

HT FLOW CONVERGENCE VALUE= 97.22 CRITERION= 0.1173
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8395
 HT FLOW CONVERGENCE VALUE= 0.1741 CRITERION= 0.6481E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4084E-01
 HT FLOW CONVERGENCE VALUE= 0.5970E-02 CRITERION= 0.6476E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 30 SUBSTEP 6 COMPLETED. CUM ITER = 735
 *** TIME = 0.278496E+10 TIME INC = 0.788940E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.55226E+08 DECREASED (FACTOR = 0.7000)

HT FLOW CONVERGENCE VALUE= 67.93 CRITERION= 0.9384E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5894
 HT FLOW CONVERGENCE VALUE= 0.1212 CRITERION= 0.6430E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2843E-01
 HT FLOW CONVERGENCE VALUE= 0.4141E-02 CRITERION= 0.6427E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 30 SUBSTEP 7 COMPLETED. CUM ITER = 737
 *** TIME = 0.284018E+10 TIME INC = 0.552258E+08
 Apply loads and solve for 100 to 1000 years

*DO LOOP ON PARAMETER= TM FROM 0.31558E+10 TO 0.31558E+11 BY 0.31558E+10

TIME= 0.31558E+10

SELECT FOR ITEM=MAT COMPONENT=
 IN RANGE 14 TO 14 STEP 1

24 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

SELECT ELEMENTS CREATED FROM SELECTED AREAS.

1280 ELEMENTS (OF 6868 DEFINED) SELECTED FROM

24 SELECTED AREAS BY ESLA COMMAND.

SPECIFIED BODY FORCE HGEN FOR ALL SELECTED ELEMENTS AT STARTING LOCATION 1
1524.19231 0.000000000E+00 0.000000000E+00 0.000000000E+00

ALL SELECT FOR ITEM=AREA COMPONENT=
IN RANGE 1 TO 302 STEP 1

302 AREAS (OF 302 DEFINED) SELECTED BY ASEL COMMAND.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

CONSTRAINT AT KEYPOINT 11
LOAD LABELS = TEMP
VALUES = 182.87 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 10
LOAD LABELS = TEMP
VALUES = 183.14 0.00000E+00 EXPANSION KEY = 1

CONSTRAINT AT KEYPOINT 9
LOAD LABELS = TEMP
VALUES = 183.78 0.00000E+00 EXPANSION KEY = 1

***** ANSYS SOLVE COMMAND *****

TRANSFER SOLID MODEL BOUNDARY CONDITIONS TO FINITE ELEMENT MODEL
CONSTRAINTS TRANSFERRED FROM KEYPOINTS = 147

*** NOTE *** CP= 32957.120 TIME= 19:42:25
Nonlinear analysis, NROPT set to 1 (full Newton-Raphson solution
procedure) for ALL DOFs.

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 19:42:25 JUN 26, 1996 CP= 32957.120
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

LOAD STEP OPTIONS

LOAD STEP NUMBER. 31
TIME AT END OF THE LOAD STEP. 0.31558E+10
AUTOMATIC TIME STEPPING ON
INITIAL NUMBER OF SUBSTEPS 10
MAXIMUM NUMBER OF SUBSTEPS 40
MINIMUM NUMBER OF SUBSTEPS 4
START WITH TIME STEP FROM PREVIOUS SUBSTEP . YES
MAXIMUM NUMBER OF EQUILIBRIUM ITERATIONS. . . . 25
STEP CHANGE BOUNDARY CONDITIONS NO
TRANSIENT (INERTIA) EFFECTS
THERMAL DOFS ON
TRANSIENT INTEGRATION PARAMETERS
THETA. 0.50000
OSCILLATION LIMIT CRITERION. 0.50000
TOLERANCE. 0.20000
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= 63.93 CRITERION= 0.9059E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5174

HT FLOW CONVERGENCE VALUE= 0.1078 CRITERION= 0.6370E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2581E-01
 HT FLOW CONVERGENCE VALUE= 0.3833E-02 CRITERION= 0.6367E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 31 SUBSTEP 1 COMPLETED. CUM ITER = 739
 *** TIME = 0.289541E+10 TIME INC = 0.552258E+08
 *** AUTO STEP TIME: NEXT TIME INC = 0.55226E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 63.77 CRITERION= 0.9011E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5183
 HT FLOW CONVERGENCE VALUE= 0.1070 CRITERION= 0.6330E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2563E-01
 HT FLOW CONVERGENCE VALUE= 0.3789E-02 CRITERION= 0.6327E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 31 SUBSTEP 2 COMPLETED. CUM ITER = 741
 *** TIME = 0.295064E+10 TIME INC = 0.552258E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+08 INCREASED (FACTOR = 1.4286)

HT FLOW CONVERGENCE VALUE= 91.30 CRITERION= 0.1110
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7407
 HT FLOW CONVERGENCE VALUE= 0.1512 CRITERION= 0.6251E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3620E-01
 HT FLOW CONVERGENCE VALUE= 0.5289E-02 CRITERION= 0.6246E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 31 SUBSTEP 3 COMPLETED. CUM ITER = 743
 *** TIME = 0.302953E+10 TIME INC = 0.788940E+08
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 91.15 CRITERION= 0.1105
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7423
 HT FLOW CONVERGENCE VALUE= 0.1497 CRITERION= 0.6189E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.3594E-01
 HT FLOW CONVERGENCE VALUE= 0.5195E-02 CRITERION= 0.6185E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 31 SUBSTEP 4 COMPLETED. CUM ITER = 745
 *** TIME = 0.310842E+10 TIME INC = 0.788940E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+08 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 54.82 CRITERION= 0.8259E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4459
 HT FLOW CONVERGENCE VALUE= 0.8973E-01 CRITERION= 0.6135E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2155E-01
 HT FLOW CONVERGENCE VALUE= 0.3096E-02 CRITERION= 0.6133E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 31 SUBSTEP 5 COMPLETED. CUM ITER = 747
 *** TIME = 0.315576E+10 TIME INC = 0.473364E+08

*ENDDO INDEX= TM

***** ANSYS SOLVE COMMAND *****

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 19:49:11 JUN 26, 1996 CP= 33319.670
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 52.05 CRITERION= 0.8043E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4355
 HT FLOW CONVERGENCE VALUE= 0.8640E-01 CRITERION= 0.6103E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2067E-01
 HT FLOW CONVERGENCE VALUE= 0.2927E-02 CRITERION= 0.6100E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 1 COMPLETED. CUM ITER = 749
 *** TIME = 0.323465E+10 TIME INC = 0.788940E+08
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+08 UNCHANGED

HT FLOW CONVERGENCE VALUE= 52.20 CRITERION= 0.8024E-01

EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4346
 HT FLOW CONVERGENCE VALUE= 0.8592E-01 CRITERION= 0.6051E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2055E-01
 HT FLOW CONVERGENCE VALUE= 0.2891E-02 CRITERION= 0.6049E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 2 COMPLETED. CUM ITER = 751
 *** TIME = 0.331355E+10 TIME INC = 0.788940E+08
 *** AUTO TIME STEP: NEXT TIME INC = 0.23668E+09 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 156.3 CRITERION= 0.1676
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.307
 HT FLOW CONVERGENCE VALUE= 0.2506 CRITERION= 0.5939E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6004E-01
 HT FLOW CONVERGENCE VALUE= 0.8224E-02 CRITERION= 0.5931E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 3 COMPLETED. CUM ITER = 753
 *** TIME = 0.355023E+10 TIME INC = 0.236682E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.71005E+09 INCREASED (FACTOR = 3.0000)

HT FLOW CONVERGENCE VALUE= 469.3 CRITERION= 0.4729
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -3.929
 HT FLOW CONVERGENCE VALUE= 0.6871 CRITERION= 0.5563E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1642
 HT FLOW CONVERGENCE VALUE= 0.2059E-01 CRITERION= 0.5542E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 4 COMPLETED. CUM ITER = 755
 *** TIME = 0.426028E+10 TIME INC = 0.710046E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.1111)

HT FLOW CONVERGENCE VALUE= 521.4 CRITERION= 0.5243
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -4.403
 HT FLOW CONVERGENCE VALUE= 0.7085 CRITERION= 0.5152E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1705
 HT FLOW CONVERGENCE VALUE= 0.1962E-01 CRITERION= 0.5130E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 5 COMPLETED. CUM ITER = 757
 *** TIME = 0.504922E+10 TIME INC = 0.788940E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 521.7 CRITERION= 0.5241
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -4.443
 HT FLOW CONVERGENCE VALUE= 0.6557 CRITERION= 0.4720E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1595
 HT FLOW CONVERGENCE VALUE= 0.1671E-01 CRITERION= 0.4699E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 6 COMPLETED. CUM ITER = 759
 *** TIME = 0.583816E+10 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+09 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 313.0 CRITERION= 0.3165
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.692
 HT FLOW CONVERGENCE VALUE= 0.3816 CRITERION= 0.4467E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9554E-01
 HT FLOW CONVERGENCE VALUE= 0.9480E-02 CRITERION= 0.4455E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 32 SUBSTEP 7 COMPLETED. CUM ITER = 761
 *** TIME = 0.631152E+10 TIME INC = 0.473364E+09

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 19:58:40 JUN 26, 1996 CP= 33826.580
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 233.3 CRITERION= 0.2374
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.687

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HT FLOW CONVERGENCE VALUE= 0.2407    CRITERION= 0.4314E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6665E-01
HT FLOW CONVERGENCE VALUE= 0.6876E-02 CRITERION= 0.4307E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 1 COMPLETED. CUM ITER = 763
*** TIME = 0.678488E+10 TIME INC = 0.473364E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.47336E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 233.2    CRITERION= 0.2371
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.693
HT FLOW CONVERGENCE VALUE= 0.2313    CRITERION= 0.4184E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.6527E-01
HT FLOW CONVERGENCE VALUE= 0.6464E-02 CRITERION= 0.4178E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 2 COMPLETED. CUM ITER = 765
*** TIME = 0.725825E+10 TIME INC = 0.473364E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.6667)

HT FLOW CONVERGENCE VALUE= 388.8    CRITERION= 0.3910
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.831
HT FLOW CONVERGENCE VALUE= 0.3584    CRITERION= 0.3947E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1012
HT FLOW CONVERGENCE VALUE= 0.9420E-02 CRITERION= 0.3937E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 3 COMPLETED. CUM ITER = 767
*** TIME = 0.804719E+10 TIME INC = 0.788940E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 388.8    CRITERION= 0.3908
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.848
HT FLOW CONVERGENCE VALUE= 0.3395    CRITERION= 0.3725E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9570E-01
HT FLOW CONVERGENCE VALUE= 0.8461E-02 CRITERION= 0.3715E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 4 COMPLETED. CUM ITER = 769
*** TIME = 0.883613E+10 TIME INC = 0.788940E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.63115E+09 DECREASED (FACTOR = 0.8000)

HT FLOW CONVERGENCE VALUE= 311.2    CRITERION= 0.3134
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -2.291
HT FLOW CONVERGENCE VALUE= 0.2621    CRITERION= 0.3528E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7448E-01
HT FLOW CONVERGENCE VALUE= 0.6290E-02 CRITERION= 0.3520E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 33 SUBSTEP 5 COMPLETED. CUM ITER = 771
*** TIME = 0.946728E+10 TIME INC = 0.631152E+09

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***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303      VERSION=HP 9000/7XX 20:05:25 JUN 26, 1996 CP= 34192.140
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

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40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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HT FLOW CONVERGENCE VALUE= 168.6    CRITERION= 0.1723
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.374
HT FLOW CONVERGENCE VALUE= 0.1502    CRITERION= 0.3416E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4163E-01
HT FLOW CONVERGENCE VALUE= 0.3302E-02 CRITERION= 0.3411E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 34 SUBSTEP 1 COMPLETED. CUM ITER = 773
*** TIME = 0.100984E+11 TIME INC = 0.631152E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.63115E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 168.8    CRITERION= 0.1721
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.377
HT FLOW CONVERGENCE VALUE= 0.1455    CRITERION= 0.3288E-01

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EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4047E-01
 HT FLOW CONVERGENCE VALUE= 0.3097E-02 CRITERION= 0.3283E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 34 SUBSTEP 2 COMPLETED. CUM ITER = 775
 *** TIME = 0.107296E+11 TIME INC = 0.631152E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.2500)

HT FLOW CONVERGENCE VALUE= 210.8 CRITERION= 0.2134
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.727
 HT FLOW CONVERGENCE VALUE= 0.1738 CRITERION= 0.3150E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4828E-01
 HT FLOW CONVERGENCE VALUE= 0.3515E-02 CRITERION= 0.3145E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 34 SUBSTEP 3 COMPLETED. CUM ITER = 777
 *** TIME = 0.115185E+11 TIME INC = 0.788940E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 211.0 CRITERION= 0.2133
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.733
 HT FLOW CONVERGENCE VALUE= 0.1697 CRITERION= 0.2992E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.4629E-01
 HT FLOW CONVERGENCE VALUE= 0.3218E-02 CRITERION= 0.2987E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 34 SUBSTEP 4 COMPLETED. CUM ITER = 779
 *** TIME = 0.123075E+11 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.31558E+09 DECREASED (FACTOR = 0.4000)

HT FLOW CONVERGENCE VALUE= 84.31 CRITERION= 0.8946E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6966
 HT FLOW CONVERGENCE VALUE= 0.6909E-01 CRITERION= 0.2939E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1875E-01
 HT FLOW CONVERGENCE VALUE= 0.1299E-02 CRITERION= 0.2937E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 34 SUBSTEP 5 COMPLETED. CUM ITER = 781
 *** TIME = 0.126230E+11 TIME INC = 0.315576E+09

***** ANSYS SOLVE COMMAND *****

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 ***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:12:15 JUN 26, 1996 CP= 34558.360
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 55.88 CRITERION= 0.6308E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4629
 HT FLOW CONVERGENCE VALUE= 0.4567E-01 CRITERION= 0.2889E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1236E-01
 HT FLOW CONVERGENCE VALUE= 0.8457E-03 CRITERION= 0.2888E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 1 COMPLETED. CUM ITER = 783
 *** TIME = 0.129386E+11 TIME INC = 0.315576E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.31558E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 55.73 CRITERION= 0.6279E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.4641
 HT FLOW CONVERGENCE VALUE= 0.4501E-01 CRITERION= 0.2859E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1222E-01
 HT FLOW CONVERGENCE VALUE= 0.8251E-03 CRITERION= 0.2858E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 2 COMPLETED. CUM ITER = 785
 *** TIME = 0.132542E+11 TIME INC = 0.315576E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 2.5000)

HT FLOW CONVERGENCE VALUE= 139.6 CRITERION= 0.1424
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.160
 HT FLOW CONVERGENCE VALUE= 0.1074 CRITERION= 0.2753E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2897E-01

HT FLOW CONVERGENCE VALUE= 0.1867E-02 CRITERION= 0.2750E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 3 COMPLETED. CUM ITER = 787
 *** TIME = 0.140431E+11 TIME INC = 0.788940E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 139.5 CRITERION= 0.1422
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.164
 HT FLOW CONVERGENCE VALUE= 0.1041 CRITERION= 0.2663E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2805E-01
 HT FLOW CONVERGENCE VALUE= 0.1748E-02 CRITERION= 0.2660E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 4 COMPLETED. CUM ITER = 789
 *** TIME = 0.148321E+11 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+09 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 83.80 CRITERION= 0.8787E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6996
 HT FLOW CONVERGENCE VALUE= 0.6228E-01 CRITERION= 0.2593E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1674E-01
 HT FLOW CONVERGENCE VALUE= 0.1034E-02 CRITERION= 0.2591E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 5 COMPLETED. CUM ITER = 791
 *** TIME = 0.153054E+11 TIME INC = 0.473364E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.47336E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 83.65 CRITERION= 0.8760E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7014
 HT FLOW CONVERGENCE VALUE= 0.6147E-01 CRITERION= 0.2543E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1642E-01
 HT FLOW CONVERGENCE VALUE= 0.9998E-03 CRITERION= 0.2542E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 35 SUBSTEP 6 COMPLETED. CUM ITER = 793
 *** TIME = 0.157788E+11 TIME INC = 0.473364E+09

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:20:25 JUN 26, 1996 CP= 34997.040
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 93.28 CRITERION= 0.9663E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6076
 HT FLOW CONVERGENCE VALUE= 0.5732E-01 CRITERION= 0.2492E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1643E-01
 HT FLOW CONVERGENCE VALUE= 0.1093E-02 CRITERION= 0.2490E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 36 SUBSTEP 1 COMPLETED. CUM ITER = 795
 *** TIME = 0.162522E+11 TIME INC = 0.473364E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.47336E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 93.12 CRITERION= 0.9642E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6091
 HT FLOW CONVERGENCE VALUE= 0.5679E-01 CRITERION= 0.2459E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1622E-01
 HT FLOW CONVERGENCE VALUE= 0.1070E-02 CRITERION= 0.2458E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 36 SUBSTEP 2 COMPLETED. CUM ITER = 797
 *** TIME = 0.167255E+11 TIME INC = 0.473364E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.6667)

HT FLOW CONVERGENCE VALUE= 155.4 CRITERION= 0.1573
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.015
 HT FLOW CONVERGENCE VALUE= 0.9197E-01 CRITERION= 0.2381E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2613E-01
 HT FLOW CONVERGENCE VALUE= 0.1676E-02 CRITERION= 0.2379E-01 <<< CONVERGED

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>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 36 SUBSTEP 3 COMPLETED. CUM ITER = 799
*** TIME = 0.175145E+11 TIME INC = 0.788940E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 155.3 CRITERION= 0.1571
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -1.018
HT FLOW CONVERGENCE VALUE= 0.8998E-01 CRITERION= 0.2321E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2552E-01
HT FLOW CONVERGENCE VALUE= 0.1598E-02 CRITERION= 0.2319E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 36 SUBSTEP 4 COMPLETED. CUM ITER = 801
*** TIME = 0.183034E+11 TIME INC = 0.788940E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.63115E+09 DECREASED (FACTOR = 0.8000)

HT FLOW CONVERGENCE VALUE= 124.4 CRITERION= 0.1265
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8156
HT FLOW CONVERGENCE VALUE= 0.6993E-01 CRITERION= 0.2256E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2008E-01
HT FLOW CONVERGENCE VALUE= 0.1186E-02 CRITERION= 0.2254E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 36 SUBSTEP 5 COMPLETED. CUM ITER = 803
*** TIME = 0.189346E+11 TIME INC = 0.631152E+09
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***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 20:27:16 JUN 26, 1996 CP= 35363.500
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844
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40 BWR MPC/Waste Package with 10 yr old, MOX SNF

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HT FLOW CONVERGENCE VALUE= 139.9 CRITERION= 0.1417
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7544
HT FLOW CONVERGENCE VALUE= 0.6752E-01 CRITERION= 0.2225E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2094E-01
HT FLOW CONVERGENCE VALUE= 0.1285E-02 CRITERION= 0.2224E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 37 SUBSTEP 1 COMPLETED. CUM ITER = 805
*** TIME = 0.195657E+11 TIME INC = 0.631152E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.63115E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 140.1 CRITERION= 0.1418
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7546
HT FLOW CONVERGENCE VALUE= 0.6527E-01 CRITERION= 0.2176E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2062E-01
HT FLOW CONVERGENCE VALUE= 0.1222E-02 CRITERION= 0.2175E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 37 SUBSTEP 2 COMPLETED. CUM ITER = 807
*** TIME = 0.201969E+11 TIME INC = 0.631152E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.2500)

HT FLOW CONVERGENCE VALUE= 174.9 CRITERION= 0.1763
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9452
HT FLOW CONVERGENCE VALUE= 0.7907E-01 CRITERION= 0.2137E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2520E-01
HT FLOW CONVERGENCE VALUE= 0.1456E-02 CRITERION= 0.2135E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 37 SUBSTEP 3 COMPLETED. CUM ITER = 809
*** TIME = 0.209858E+11 TIME INC = 0.788940E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 175.1 CRITERION= 0.1763
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9459
HT FLOW CONVERGENCE VALUE= 0.7723E-01 CRITERION= 0.2078E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2474E-01
HT FLOW CONVERGENCE VALUE= 0.1391E-02 CRITERION= 0.2077E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
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*** LOAD STEP 37 SUBSTEP 4 COMPLETED. CUM ITER = 811
 *** TIME = 0.217747E+11 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.31558E+09 DECREASED (FACTOR = 0.4000)

HT FLOW CONVERGENCE VALUE= 69.93 CRITERION= 0.7298E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3796
 HT FLOW CONVERGENCE VALUE= 0.3096E-01 CRITERION= 0.2067E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.9951E-02
 HT FLOW CONVERGENCE VALUE= 0.5557E-03 CRITERION= 0.2066E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 37 SUBSTEP 5 COMPLETED. CUM ITER = 813
 *** TIME = 0.220903E+11 TIME INC = 0.315576E+09

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:34:02 JUN 26, 1996 CP= 35729.340
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 74.90 CRITERION= 0.7766E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3709
 HT FLOW CONVERGENCE VALUE= 0.3134E-01 CRITERION= 0.2041E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1027E-01
 HT FLOW CONVERGENCE VALUE= 0.5871E-03 CRITERION= 0.2040E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 38 SUBSTEP 1 COMPLETED. CUM ITER = 815
 *** TIME = 0.224059E+11 TIME INC = 0.315576E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.31558E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 74.75 CRITERION= 0.7752E-01
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.3719
 HT FLOW CONVERGENCE VALUE= 0.3107E-01 CRITERION= 0.2034E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1018E-01
 HT FLOW CONVERGENCE VALUE= 0.5800E-03 CRITERION= 0.2033E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 38 SUBSTEP 2 COMPLETED. CUM ITER = 817
 *** TIME = 0.227215E+11 TIME INC = 0.315576E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 2.5000)

HT FLOW CONVERGENCE VALUE= 187.2 CRITERION= 0.1882
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9288
 HT FLOW CONVERGENCE VALUE= 0.7542E-01 CRITERION= 0.1984E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2468E-01
 HT FLOW CONVERGENCE VALUE= 0.1382E-02 CRITERION= 0.1983E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 38 SUBSTEP 3 COMPLETED. CUM ITER = 819
 *** TIME = 0.235104E+11 TIME INC = 0.788940E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 187.0 CRITERION= 0.1881
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.9309
 HT FLOW CONVERGENCE VALUE= 0.7398E-01 CRITERION= 0.1952E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2424E-01
 HT FLOW CONVERGENCE VALUE= 0.1335E-02 CRITERION= 0.1951E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 38 SUBSTEP 4 COMPLETED. CUM ITER = 821
 *** TIME = 0.242994E+11 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.47336E+09 DECREASED (FACTOR = 0.6000)

HT FLOW CONVERGENCE VALUE= 112.3 CRITERION= 0.1140
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5588
 HT FLOW CONVERGENCE VALUE= 0.4426E-01 CRITERION= 0.1918E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1451E-01
 HT FLOW CONVERGENCE VALUE= 0.7908E-03 CRITERION= 0.1917E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2

*** LOAD STEP 38 SUBSTEP 5 COMPLETED. CUM ITER = 823

*** TIME = 0.247727E+11 TIME INC = 0.473364E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.47336E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 112.2 CRITERION= 0.1139
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5599
 HT FLOW CONVERGENCE VALUE= 0.4372E-01 CRITERION= 0.1902E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1438E-01
 HT FLOW CONVERGENCE VALUE= 0.7748E-03 CRITERION= 0.1902E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 38 SUBSTEP 6 COMPLETED. CUM ITER = 825
 *** TIME = 0.252461E+11 TIME INC = 0.473364E+09

***** ANSYS SOLVE COMMAND *****

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:42:17 JUN 26, 1996 CP= 36168.370
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 107.0 CRITERION= 0.1087
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5021
 HT FLOW CONVERGENCE VALUE= 0.4012E-01 CRITERION= 0.1874E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1339E-01
 HT FLOW CONVERGENCE VALUE= 0.7287E-03 CRITERION= 0.1873E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 39 SUBSTEP 1 COMPLETED. CUM ITER = 827
 *** TIME = 0.257194E+11 TIME INC = 0.473364E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.47336E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 106.9 CRITERION= 0.1086
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5031
 HT FLOW CONVERGENCE VALUE= 0.3973E-01 CRITERION= 0.1864E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1330E-01
 HT FLOW CONVERGENCE VALUE= 0.7174E-03 CRITERION= 0.1863E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 39 SUBSTEP 2 COMPLETED. CUM ITER = 829
 *** TIME = 0.261928E+11 TIME INC = 0.473364E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.6667)

HT FLOW CONVERGENCE VALUE= 178.4 CRITERION= 0.1793
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8381
 HT FLOW CONVERGENCE VALUE= 0.6478E-01 CRITERION= 0.1822E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2177E-01
 HT FLOW CONVERGENCE VALUE= 0.1153E-02 CRITERION= 0.1822E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 39 SUBSTEP 3 COMPLETED. CUM ITER = 831
 *** TIME = 0.269817E+11 TIME INC = 0.788940E+09
 *** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 178.2 CRITERION= 0.1792
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.8398
 HT FLOW CONVERGENCE VALUE= 0.6373E-01 CRITERION= 0.1800E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.2150E-01
 HT FLOW CONVERGENCE VALUE= 0.1121E-02 CRITERION= 0.1799E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 39 SUBSTEP 4 COMPLETED. CUM ITER = 833
 *** TIME = 0.277707E+11 TIME INC = 0.788940E+09
 *** AUTO TIME STEP: NEXT TIME INC = 0.63115E+09 DECREASED (FACTOR = 0.8000)

HT FLOW CONVERGENCE VALUE= 142.7 CRITERION= 0.1438
 EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.6720
 HT FLOW CONVERGENCE VALUE= 0.5052E-01 CRITERION= 0.1764E-01
 EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1708E-01
 HT FLOW CONVERGENCE VALUE= 0.8782E-03 CRITERION= 0.1764E-01 <<< CONVERGED
 >>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
 *** LOAD STEP 39 SUBSTEP 5 COMPLETED. CUM ITER = 835
 *** TIME = 0.284018E+11 TIME INC = 0.631152E+09

***** ANSYS SOLVE COMMAND *****

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 20:49:03 JUN 26, 1996 CP= 36534.560
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

HT FLOW CONVERGENCE VALUE= 128.2 CRITERION= 0.1294
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5961
HT FLOW CONVERGENCE VALUE= 0.4463E-01 CRITERION= 0.1752E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1519E-01
HT FLOW CONVERGENCE VALUE= 0.7766E-03 CRITERION= 0.1751E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 1 COMPLETED. CUM ITER = 837
*** TIME = 0.290330E+11 TIME INC = 0.631152E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.63115E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 128.3 CRITERION= 0.1295
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.5958
HT FLOW CONVERGENCE VALUE= 0.4415E-01 CRITERION= 0.1720E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1505E-01
HT FLOW CONVERGENCE VALUE= 0.7601E-03 CRITERION= 0.1720E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 2 COMPLETED. CUM ITER = 839
*** TIME = 0.296641E+11 TIME INC = 0.631152E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.78894E+09 INCREASED (FACTOR = 1.2500)

HT FLOW CONVERGENCE VALUE= 160.3 CRITERION= 0.1612
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7461
HT FLOW CONVERGENCE VALUE= 0.5421E-01 CRITERION= 0.1703E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1856E-01
HT FLOW CONVERGENCE VALUE= 0.9234E-03 CRITERION= 0.1702E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 3 COMPLETED. CUM ITER = 841
*** TIME = 0.304531E+11 TIME INC = 0.788940E+09
*** AUTO STEP TIME: NEXT TIME INC = 0.78894E+09 UNCHANGED

HT FLOW CONVERGENCE VALUE= 160.4 CRITERION= 0.1613
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.7462
HT FLOW CONVERGENCE VALUE= 0.5344E-01 CRITERION= 0.1666E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.1834E-01
HT FLOW CONVERGENCE VALUE= 0.8983E-03 CRITERION= 0.1665E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 4 COMPLETED. CUM ITER = 843
*** TIME = 0.312420E+11 TIME INC = 0.788940E+09
*** AUTO TIME STEP: NEXT TIME INC = 0.31558E+09 DECREASED (FACTOR = 0.4000)

HT FLOW CONVERGENCE VALUE= 64.07 CRITERION= 0.6623E-01
EQUIL ITER 1 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= -0.2993
HT FLOW CONVERGENCE VALUE= 0.2143E-01 CRITERION= 0.1664E-01
EQUIL ITER 2 COMPLETED. NEW TRIANG MATRIX. MAX DOF INC= 0.7363E-02
HT FLOW CONVERGENCE VALUE= 0.3595E-03 CRITERION= 0.1664E-01 <<< CONVERGED
>>> SOLUTION CONVERGED AFTER EQUILIBRIUM ITERATION 2
*** LOAD STEP 40 SUBSTEP 5 COMPLETED. CUM ITER = 845
*** TIME = 0.315576E+11 TIME INC = 0.315576E+09

FINISH SOLUTION PROCESSING

***** ROUTINE COMPLETED ***** CP = 36898.830

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= mpc40mxx.db
FOR POSSIBLE RESUME FROM THIS POINT

Create element contour plots of solution results

Sort through solution results for time of max temp.

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 20:55:50 JUN 26, 1996 CP= 36904.770
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

VARIABLE 2 IS AT NODE 854 ITEM= TEMP COMP= NAME= peakclad

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 854 TEMP peakclad 166.8 0.3156E+11 254.3 0.2525E+09

*GET TMTMAX FROM VARI 2 ITEM=EXTR TMAX VALUE= 252460832.

***** ROUTINE COMPLETED ***** CP = 36905.090

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 20:55:53 JUN 26, 1996 CP= 36905.090
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MPC/Waste Package with 10 yr old, MOX SNF

***** ANSYS RESULTS INTERPRETATION (POST1) *****

Create temperature contour plots of WP at peak

GRAPHIC DISPLAY RESET

XYZ TRIAD DISPLAY SET TO OFF

NUMBER KEY SET TO 1 -1=NONE 0=BOTH 1=COLOR 2=NUMBER

MAT NUMBERING KEY = 1

HIDDEN DISPLAY (PRECISE) IN WINDOW 1

ELEMENT OUTLINE STYLE FOR WINDOW 1 IS -1 0=DEFAULT, 1=ALTERNATE, -1=NONE

FOCUS POINT FOR WINDOW 1 .90080E-01 .00000E+00 .00000E+00

UNSELECT FOR ITEM=MAT COMPONENT=
IN RANGE 7 TO 7 STEP 1

5832 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0

USE DATA SET FOR TIME OR FREQUENCY= 0.25246E+09

SET COMMAND GOT LOAD STEP= 20 SUBSTEP= 40 CUMULATIVE ITERATION= 440

TIME/FREQUENCY= 0.25246E+09

TITLE= 40 BWR MPC/Waste Package with 10 yr old, MOX SNF

TITLE=

40 BWR MOX MPC/WP Time of Peak Temp. (8.000001 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=

40 BWR MOX MPC/WP Time of Peak Temp. (8.000001 years)

*** WARNING ***

CP= 36913.050 TIME= 20:56:05

The selected element set contains mixed materials.

This could invalidate error estimation.

Create temperature contour plots at 10, 50, and 100 yrs

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0

USE DATA SET FOR TIME OR FREQUENCY= 0.31558E+09

SET COMMAND GOT LOAD STEP= 22 SUBSTEP= 40 CUMULATIVE ITERATION= 520
TIME/FREQUENCY= 0.31558E+09

TITLE= 40 BWR MPC/Waste Package with 10 yr old, MOX SNF

TITLE=

40 BWR MOX MPC/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 161.98 BY .72723 TO 254.34

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu10.grph - RASTER MODE.

DISPLAY TITLE=

40 BWR MOX MPC/WP at 10 years

*** WARNING ***

CP= 36928.340 TIME= 20:56:24

The selected element set contains mixed materials.

This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0

USE DATA SET FOR TIME OR FREQUENCY= 0.15779E+10

SET COMMAND GOT LOAD STEP= 26 SUBSTEP= 30 CUMULATIVE ITERATION= 670
TIME/FREQUENCY= 0.15779E+10

TITLE= 40 BWR MPC/Waste Package with 10 yr old, MOX SNF

TITLE=

40 BWR MOX MPC/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 161.98 BY .72723 TO 254.34

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu50.grph - RASTER MODE.

DISPLAY TITLE=

40 BWR MOX MPC/WP at 50 years

*** WARNING *** CP= 36943.700 TIME= 20:56:43
The selected element set contains mixed materials.
This could invalidate error estimation.

USE NEAREST SUBSTEP ON RESULT FILE FOR LOAD CASE 0
USE DATA SET FOR TIME OR FREQUENCY= 0.31558E+10

SET COMMAND GOT LOAD STEP= 31 SUBSTEP= 5 CUMULATIVE ITERATION= 747
TIME/FREQUENCY= 0.31558E+10
TITLE= 40 BWR MPC/Waste Package with 10 yr old, MOX SNF

TITLE=
40 BWR MOX MPC/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 161.98 BY .72723 TO 254.34

DISPLAY NODAL SOLUTION, ITEM=TEMP COMP=

CUMULATIVE DISPLAY NUMBER 1 WRITTEN TO FILE solu100.grph - RASTER MODE.
DISPLAY TITLE=
40 BWR MOX MPC/WP at 100 years

*** WARNING *** CP= 36958.880 TIME= 20:57:01
The selected element set contains mixed materials.
This could invalidate error estimation.

ALL SELECT FOR ITEM=ELEM COMPONENT=
IN RANGE 1 TO 7845 STEP 1

6868 ELEMENTS (OF 6868 DEFINED) SELECTED BY ESEL COMMAND.

EXIT THE ANSYS POST1 DATABASE PROCESSOR

***** ROUTINE COMPLETED ***** CP = 36966.240

Print time/temperature output at specific locations
Save profile from center to edge

Variable Legend: A01i000

c = center of assembly
h = halfway between center and tube
s = inside structural stainless tube layer
a = aluminum-born tube layer
t = stainless tube cladding
g = tube guide
m = mpc shell
i = inner barrier of DC
o = outer barrier of DC
= ID number of assembly (01 is center)
i = side of assembly toward center of WP
o = side of assembly toward edge of WP
000 = profile center down
045 = profile 45 deg down
090 = profile center side
135 = profile 45 deg up
180 = profile center up

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 20:57:08 JUN 26, 1996 CP= 36966.250
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** TIME-HISTORY POSTPROCESSOR (POST26) *****

ALL POST26 SPECIFICATIONS ARE RESET TO INITIAL DEFAULTS

MAXIMUM NUMBER OF VARIABLES= 41

* Temperature Profile from center to bottom of WP (0 deg.) *

VARIABLE 2	IS AT NODE	924	ITEM= TEMP COMP=	NAME= t02i000
VARIABLE 3	IS AT NODE	914	ITEM= TEMP COMP=	NAME= a02i000
VARIABLE 4	IS AT NODE	850	ITEM= TEMP COMP=	NAME= s02i000
VARIABLE 5	IS AT NODE	856	ITEM= TEMP COMP=	NAME= h02i000
VARIABLE 6	IS AT NODE	854	ITEM= TEMP COMP=	NAME= c02i000
VARIABLE 7	IS AT NODE	852	ITEM= TEMP COMP=	NAME= h02o000
VARIABLE 8	IS AT NODE	849	ITEM= TEMP COMP=	NAME= s02o000
VARIABLE 9	IS AT NODE	895	ITEM= TEMP COMP=	NAME= a02o000
VARIABLE 10	IS AT NODE	894	ITEM= TEMP COMP=	NAME= t08i000
VARIABLE 11	IS AT NODE	1027	ITEM= TEMP COMP=	NAME= a08i000
VARIABLE 12	IS AT NODE	963	ITEM= TEMP COMP=	NAME= s08i000
VARIABLE 13	IS AT NODE	969	ITEM= TEMP COMP=	NAME= h08i000
VARIABLE 14	IS AT NODE	967	ITEM= TEMP COMP=	NAME= c08i000
VARIABLE 15	IS AT NODE	965	ITEM= TEMP COMP=	NAME= h08o000
VARIABLE 16	IS AT NODE	962	ITEM= TEMP COMP=	NAME= s08o000
VARIABLE 17	IS AT NODE	1008	ITEM= TEMP COMP=	NAME= a08o000
VARIABLE 18	IS AT NODE	1150	ITEM= TEMP COMP=	NAME= t18i000
VARIABLE 19	IS AT NODE	1140	ITEM= TEMP COMP=	NAME= a18i000
VARIABLE 20	IS AT NODE	1076	ITEM= TEMP COMP=	NAME= s18i000
VARIABLE 21	IS AT NODE	1082	ITEM= TEMP COMP=	NAME= h18i000
VARIABLE 22	IS AT NODE	1080	ITEM= TEMP COMP=	NAME= c18i000
VARIABLE 23	IS AT NODE	1078	ITEM= TEMP COMP=	NAME= h18o000
VARIABLE 24	IS AT NODE	1075	ITEM= TEMP COMP=	NAME= s18o000
VARIABLE 25	IS AT NODE	1121	ITEM= TEMP COMP=	NAME= a18o000
VARIABLE 26	IS AT NODE	1120	ITEM= TEMP COMP=	NAME= t24i000
VARIABLE 27	IS AT NODE	4124	ITEM= TEMP COMP=	NAME= a24i000
VARIABLE 28	IS AT NODE	4072	ITEM= TEMP COMP=	NAME= s24i000

VARIABLE 29 IS AT NODE 4075 ITEM= TEMP COMP= NAME= h24i000
 VARIABLE 30 IS AT NODE 4077 ITEM= TEMP COMP= NAME= c24i000
 VARIABLE 31 IS AT NODE 4079 ITEM= TEMP COMP= NAME= h24o000
 VARIABLE 32 IS AT NODE 4073 ITEM= TEMP COMP= NAME= s24o000
 VARIABLE 33 IS AT NODE 4137 ITEM= TEMP COMP= NAME= t24o000
 VARIABLE 34 IS AT NODE 4865 ITEM= TEMP COMP= NAME= g24i000
 VARIABLE 35 IS AT NODE 4860 ITEM= TEMP COMP= NAME= g24o000
 VARIABLE 36 IS AT NODE 5019 ITEM= TEMP COMP= NAME= m24i000
 VARIABLE 37 IS AT NODE 4946 ITEM= TEMP COMP= NAME= m24o000
 VARIABLE 38 IS AT NODE 5435 ITEM= TEMP COMP= NAME= i24i000
 VARIABLE 39 IS AT NODE 5508 ITEM= TEMP COMP= NAME= i24o000
 VARIABLE 40 IS AT NODE 6022 ITEM= TEMP COMP= NAME= o24o000

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	924 TEMP	t02i000	165.4	0.3156E+11	245.8	0.2840E+09
3 NSOL	914 TEMP	a02i000	165.4	0.3156E+11	245.8	0.2840E+09
4 NSOL	850 TEMP	s02i000	165.4	0.3156E+11	245.8	0.2840E+09
5 NSOL	856 TEMP	h02i000	166.5	0.3156E+11	252.6	0.2525E+09
6 NSOL	854 TEMP	c02i000	166.8	0.3156E+11	254.3	0.2525E+09
7 NSOL	852 TEMP	h02o000	166.4	0.3156E+11	252.0	0.2525E+09
8 NSOL	849 TEMP	s02o000	165.2	0.3156E+11	244.5	0.2840E+09
9 NSOL	895 TEMP	a02o000	165.2	0.3156E+11	244.5	0.2840E+09
10 NSOL	894 TEMP	t08i000	165.2	0.3156E+11	244.5	0.2840E+09
11 NSOL	1027 TEMP	a08i000	165.2	0.3156E+11	244.5	0.2840E+09
12 NSOL	963 TEMP	s08i000	165.2	0.3156E+11	244.5	0.2840E+09
13 NSOL	969 TEMP	h08i000	166.2	0.3156E+11	250.6	0.2525E+09
14 NSOL	967 TEMP	c08i000	166.4	0.3156E+11	251.6	0.2525E+09
15 NSOL	965 TEMP	h08o000	166.0	0.3156E+11	248.6	0.2525E+09
16 NSOL	962 TEMP	s08o000	164.7	0.3156E+11	240.5	0.3156E+09
17 NSOL	1008 TEMP	a08o000	164.7	0.3156E+11	240.4	0.3156E+09
18 NSOL	1150 TEMP	t18i000	164.7	0.3156E+11	240.4	0.3156E+09
19 NSOL	1140 TEMP	a18i000	164.7	0.3156E+11	240.4	0.3156E+09
20 NSOL	1076 TEMP	s18i000	164.7	0.3156E+11	240.4	0.3156E+09
21 NSOL	1082 TEMP	h18i000	165.6	0.3156E+11	245.8	0.2840E+09
22 NSOL	1080 TEMP	c18i000	165.7	0.3156E+11	246.1	0.2840E+09
23 NSOL	1078 TEMP	h18o000	165.2	0.3156E+11	242.3	0.3156E+09
24 NSOL	1075 TEMP	s18o000	163.8	0.3156E+11	233.7	0.6312E+09
25 NSOL	1121 TEMP	a18o000	163.8	0.3156E+11	233.6	0.6312E+09
26 NSOL	1120 TEMP	t24i000	163.8	0.3156E+11	233.6	0.6312E+09
27 NSOL	4124 TEMP	a24i000	163.8	0.3156E+11	233.6	0.6312E+09
28 NSOL	4072 TEMP	s24i000	163.8	0.3156E+11	233.6	0.6312E+09
29 NSOL	4075 TEMP	h24i000	164.4	0.3156E+11	237.0	0.3156E+09
30 NSOL	4077 TEMP	c24i000	164.3	0.3156E+11	235.5	0.6312E+09
31 NSOL	4079 TEMP	h24o000	161.5	0.1000E-05	230.3	0.9467E+09
32 NSOL	4073 TEMP	s24o000	140.5	0.1000E-05	220.0	0.9467E+09
33 NSOL	4137 TEMP	t24o000	140.3	0.1000E-05	219.9	0.9467E+09
34 NSOL	4865 TEMP	g24i000	129.1	0.1000E-05	215.0	0.9467E+09
35 NSOL	4860 TEMP	g24o000	128.9	0.1000E-05	214.9	0.9467E+09
36 NSOL	5019 TEMP	m24i000	120.1	0.1000E-05	210.8	0.9467E+09
37 NSOL	4946 TEMP	m24o000	119.1	0.1000E-05	210.2	0.9467E+09
38 NSOL	5435 TEMP	i24i000	28.97	0.1000E-05	190.6	0.1578E+10
39 NSOL	5508 TEMP	i24o000	27.89	0.1000E-05	190.1	0.1578E+10
40 NSOL	6022 TEMP	o24o000	26.14	0.1000E-05	189.3	0.1578E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.510
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	924 TEMP t02i000	914 TEMP a02i000	850 TEMP s02i000	856 TEMP h02i000	854 TEMP c02i000	852 TEMP h02o000
0.10000E-05	182.255	182.257	182.334	192.110	194.575	191.310
0.20000E-05	201.514	201.516	201.591	210.731	213.024	209.937
31.558	201.514	201.516	201.591	210.731	213.024	209.937
0.31558E+07	216.677	216.679	216.752	225.414	227.592	224.663
0.63116E+07	220.668	220.670	220.742	229.274	231.416	228.525
0.94673E+07	223.099	223.101	223.173	231.611	233.728	230.866
0.12623E+08	224.932	224.934	225.006	233.383	235.484	232.640
0.15779E+08	226.397	226.399	226.470	234.783	236.868	234.042
0.18935E+08	227.638	227.640	227.711	235.978	238.051	235.239
0.22090E+08	228.695	228.698	228.768	236.984	239.045	236.247
0.25246E+08	229.654	229.657	229.727	237.913	239.964	237.177
0.28402E+08	230.466	230.469	230.539	238.686	240.728	237.952
0.31558E+08	231.170	231.172	231.242	239.345	241.376	238.613
0.63115E+08	236.137	236.139	236.208	244.028	245.987	243.311
0.94673E+08	239.058	239.060	239.128	246.732	248.635	246.029
0.12623E+09	241.164	241.166	241.232	248.646	250.502	247.956
0.15779E+09	242.822	242.824	242.889	250.130	251.947	249.453
0.18935E+09	244.113	244.115	244.178	251.264	253.049	250.599
0.22090E+09	244.990	244.992	245.055	252.001	253.753	251.344
0.25246E+09	245.738	245.740	245.801	252.616	254.337	251.970
0.28402E+09	245.777	245.779	245.839	252.537	254.228	251.901
0.31558E+09	245.727	245.729	245.788	252.376	254.039	251.750
0.63115E+09	244.301	244.303	244.353	250.021	251.446	249.489
0.94673E+09	242.830	242.832	242.876	247.872	249.129	247.405
0.12623E+10	239.205	239.206	239.246	243.772	244.913	243.353
0.15779E+10	235.398	235.399	235.435	239.613	240.667	239.229
0.18935E+10	231.802	231.803	231.837	235.746	236.733	235.390
0.22090E+10	228.438	228.439	228.470	232.170	233.107	231.837
0.25246E+10	224.896	224.897	224.927	228.461	229.356	228.145
0.28402E+10	221.886	221.887	221.915	225.310	226.171	225.008
0.31558E+10	219.217	219.218	219.245	222.519	223.351	222.231
0.63115E+10	203.218	203.219	203.239	205.755	206.398	205.543
0.94673E+10	192.834	192.835	192.851	194.920	195.452	194.751
0.12623E+11	186.512	186.512	186.526	188.287	188.741	188.146
0.15779E+11	182.244	182.244	182.256	183.804	184.203	183.682
0.18935E+11	178.471	178.472	178.482	179.880	180.242	179.771
0.22090E+11	174.926	174.926	174.936	176.229	176.564	176.129
0.25246E+11	171.414	171.415	171.424	172.629	172.941	172.537
0.28402E+11	168.233	168.233	168.242	169.378	169.673	169.292
0.31558E+11	165.399	165.400	165.407	166.484	166.764	166.403

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.530
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	849 TEMP s02o000	895 TEMP a02o000	894 TEMP t08i000	1027 TEMP a08i000	963 TEMP s08i000	969 TEMP h08i000
0.10000E-05	180.643	180.561	180.559	180.555	180.627	189.643

0.20000E-05	199.916	199.836	199.833	199.830	199.900	208.281
31.558	199.916	199.836	199.833	199.830	199.900	208.281
0.31558E+07	215.175	215.097	215.094	215.091	215.159	223.061
0.63116E+07	219.170	219.092	219.090	219.086	219.154	226.925
0.94673E+07	221.607	221.530	221.527	221.523	221.590	229.271
0.12623E+08	223.444	223.367	223.364	223.361	223.428	231.049
0.15779E+08	224.914	224.837	224.834	224.831	224.897	232.456
0.18935E+08	226.158	226.082	226.079	226.076	226.142	233.656
0.22090E+08	227.220	227.144	227.142	227.138	227.204	234.669
0.25246E+08	228.183	228.107	228.104	228.101	228.167	235.602
0.28402E+08	228.999	228.923	228.921	228.917	228.983	236.581
0.31558E+08	229.706	229.631	229.628	229.624	229.690	237.045
0.63115E+08	234.706	234.632	234.630	234.626	234.690	241.775
0.94673E+08	237.656	237.584	237.582	237.578	237.641	244.521
0.12623E+09	239.789	239.718	239.716	239.713	239.774	246.476
0.15779E+09	241.474	241.405	241.403	241.399	241.459	248.000
0.18935E+09	242.790	242.722	242.720	242.717	242.775	249.171
0.22090E+09	243.692	243.625	243.623	243.620	243.677	249.942
0.25246E+09	244.464	244.398	244.396	244.393	244.449	250.588
0.28402E+09	244.524	244.460	244.458	244.455	244.510	250.543
0.31558E+09	244.495	244.432	244.429	244.427	244.481	250.415
0.63115E+09	243.247	243.193	243.191	243.189	243.235	248.345
0.94673E+09	241.907	241.859	241.857	241.855	241.896	246.400
0.12623E+10	238.377	238.334	238.332	238.330	238.367	242.450
0.15779E+10	234.641	234.602	234.600	234.599	234.632	238.405
0.18935E+10	231.101	231.065	231.064	231.062	231.094	234.627
0.22090E+10	227.781	227.747	227.746	227.744	227.773	231.121
0.25246E+10	224.275	224.243	224.241	224.240	224.268	227.468
0.28402E+10	221.294	221.263	221.262	221.261	221.287	224.363
0.31558E+10	218.650	218.620	218.619	218.618	218.643	221.613
0.63115E+10	202.802	202.780	202.779	202.778	202.797	205.089
0.94673E+10	192.503	192.485	192.485	192.484	192.499	194.389
0.12623E+11	186.236	186.221	186.221	186.220	186.233	187.844
0.15779E+11	182.005	181.992	181.992	181.991	182.003	183.420
0.18935E+11	178.258	178.247	178.246	178.246	178.256	179.538
0.22090E+11	174.731	174.721	174.720	174.720	174.729	175.916
0.25246E+11	171.234	171.225	171.225	171.224	171.233	172.340
0.28402E+11	168.065	168.056	168.056	168.055	168.063	169.108
0.31558E+11	165.241	165.233	165.233	165.232	165.240	166.230

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.540
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	967 TEMP c08i000	965 TEMP h08o000	962 TEMP s08o000	1008 TEMP a08o000	1150 TEMP t18i000	1140 TEMP a18i000
0.10000E-05	191.351	187.262	175.585	175.499	175.485	175.486
0.20000E-05	209.818	205.913	194.902	194.817	194.803	194.804
31.558	209.818	205.913	194.902	194.817	194.803	194.804
0.31558E+07	224.488	220.753	210.303	210.220	210.206	210.207
0.63116E+07	228.316	224.620	214.306	214.223	214.210	214.211
0.94673E+07	230.640	226.973	216.759	216.676	216.662	216.663
0.12623E+08	232.403	228.756	218.608	218.525	218.512	218.513
0.15779E+08	233.795	230.170	220.092	220.009	219.996	219.997
0.18935E+08	234.984	231.375	221.348	221.266	221.252	221.253
0.22090E+08	235.986	232.394	222.422	222.341	222.327	222.328
0.25246E+08	236.911	233.331	223.395	223.313	223.300	223.301
0.28402E+08	237.682	234.115	224.223	224.141	224.128	224.129
0.31558E+08	238.337	234.784	224.941	224.860	224.847	224.847
0.63115E+08	243.007	239.558	230.042	229.963	229.950	229.951
0.94673E+08	245.711	242.346	233.085	233.008	232.995	232.996
0.12623E+09	247.631	244.342	235.306	235.230	235.217	235.218

0.15779E+09	249.123	245.905	237.076	237.002	236.989	236.990
0.18935E+09	250.267	247.113	238.473	238.400	238.388	238.388
0.22090E+09	251.014	247.919	239.453	239.381	239.369	239.370
0.25246E+09	251.640	248.601	240.300	240.229	240.217	240.218
0.28402E+09	251.576	248.589	240.432	240.363	240.351	240.352
0.31558E+09	251.431	248.493	240.471	240.403	240.391	240.392
0.63115E+09	249.221	246.695	239.803	239.745	239.735	239.736
0.94673E+09	247.174	244.950	238.888	238.837	238.828	238.829
0.12623E+10	243.158	241.150	235.672	235.626	235.619	235.619
0.15779E+10	239.064	237.217	232.174	232.132	232.125	232.126
0.18935E+10	235.249	233.527	228.819	228.781	228.774	228.775
0.22090E+10	231.715	230.090	225.643	225.607	225.601	225.601
0.25246E+10	228.039	226.493	222.254	222.220	222.215	222.215
0.28402E+10	224.916	223.435	219.371	219.338	219.333	219.333
0.31558E+10	222.149	220.724	216.810	216.778	216.773	216.774
0.63115E+10	205.515	204.438	201.456	201.433	201.429	201.429
0.94673E+10	194.748	193.870	191.432	191.414	191.411	191.411
0.12623E+11	188.153	187.411	185.343	185.328	185.325	185.326
0.15779E+11	183.694	183.045	181.232	181.218	181.216	181.216
0.18935E+11	179.787	179.202	177.568	177.556	177.554	177.554
0.22090E+11	176.147	175.609	174.100	174.089	174.088	174.088
0.25246E+11	172.557	172.057	170.653	170.643	170.641	170.641
0.28402E+11	169.314	168.843	167.522	167.512	167.511	167.511
0.31558E+11	166.427	165.982	164.731	164.722	164.721	164.721

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.550
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1076 TEMP s18i000	1082 TEMP h18i000	1080 TEMP c18i000	1078 TEMP h18o000	1075 TEMP s18o000	1121 TEMP a18o000
0.10000E-05	175.553	183.866	184.747	179.611	166.480	166.386
0.20000E-05	194.869	202.538	203.253	198.319	185.909	185.816
31.558	194.869	202.538	203.253	198.319	185.909	185.816
0.31558E+07	210.270	217.460	218.076	213.345	201.551	201.460
0.63116E+07	214.273	221.328	221.909	217.219	205.573	205.482
0.94673E+07	216.725	223.692	224.252	219.594	208.056	207.965
0.12623E+08	218.575	225.482	226.030	221.395	209.931	209.840
0.15779E+08	220.059	226.906	227.441	222.830	211.441	211.351
0.18935E+08	221.315	228.119	228.644	224.052	212.720	212.631
0.22090E+08	222.389	229.146	229.662	225.091	213.819	213.729
0.25246E+08	223.362	230.089	230.600	226.043	214.811	214.722
0.28402E+08	224.190	230.881	231.385	226.845	215.660	215.571
0.31558E+08	224.908	231.558	232.055	227.532	216.400	216.311
0.63115E+08	230.010	236.398	236.850	232.457	221.691	221.604
0.94673E+08	233.053	239.246	239.671	235.383	224.906	224.821
0.12623E+09	235.274	241.299	241.701	237.508	227.288	227.205
0.15779E+09	237.045	242.918	243.301	239.198	229.215	229.133
0.18935E+09	238.442	244.179	244.547	240.525	230.758	230.678
0.22090E+09	239.423	245.036	245.392	241.447	231.879	231.800
0.25246E+09	240.270	245.768	246.112	242.241	232.862	232.785
0.28402E+09	240.403	245.803	246.141	242.337	233.124	233.048
0.31558E+09	240.442	245.753	246.084	242.343	233.285	233.210
0.63115E+09	239.779	244.342	244.628	241.415	233.655	233.591
0.94673E+09	238.866	242.883	243.138	240.312	233.501	233.445
0.12623E+10	235.653	239.295	239.535	236.988	230.846	230.796
0.15779E+10	232.157	235.523	235.754	233.416	227.771	227.725
0.18935E+10	228.804	231.959	232.183	230.008	224.745	224.703
0.22090E+10	225.628	228.620	228.840	226.790	221.826	221.786
0.25246E+10	222.241	225.102	225.319	223.370	218.646	218.608
0.28402E+10	219.358	222.110	222.325	220.462	215.936	215.900
0.31558E+10	216.797	219.456	219.668	217.877	213.521	213.487

0.63115E+10	201.447	203.508	203.694	202.348	199.046	199.021
0.94673E+10	191.425	193.128	193.294	192.203	189.512	189.492
0.12623E+11	185.337	186.792	186.939	186.019	183.741	183.724
0.15779E+11	181.227	182.507	182.641	181.837	179.842	179.827
0.18935E+11	177.564	178.723	178.847	178.124	176.328	176.315
0.22090E+11	174.096	175.170	175.287	174.622	172.966	172.954
0.25246E+11	170.649	171.652	171.763	171.146	169.606	169.595
0.28402E+11	167.518	168.465	168.573	167.993	166.544	166.534
0.31558E+11	164.728	165.627	165.730	165.183	163.813	163.803

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.560
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1120 TEMP t24i000	4124 TEMP a24i000	4072 TEMP s24i000	4075 TEMP h24i000	4077 TEMP c24i000	4079 TEMP h24o000
0.10000E-05	166.382	166.360	166.414	172.563	170.762	161.450
0.20000E-05	185.811	185.790	185.842	191.428	189.593	180.738
31.558	185.811	185.790	185.842	191.428	189.593	180.738
0.31558E+07	201.455	201.434	201.485	206.695	204.905	196.507
0.63116E+07	205.478	205.457	205.507	210.598	208.799	200.495
0.94673E+07	207.961	207.940	207.990	213.006	211.208	202.977
0.12623E+08	209.836	209.815	209.865	214.831	213.035	204.857
0.15779E+08	211.347	211.326	211.375	216.292	214.499	206.372
0.18935E+08	212.626	212.606	212.655	217.535	215.745	207.659
0.22090E+08	213.725	213.704	213.753	218.596	216.808	208.763
0.25246E+08	214.717	214.697	214.745	219.565	217.781	209.767
0.28402E+08	215.567	215.546	215.595	220.386	218.605	210.625
0.31558E+08	216.306	216.286	216.334	221.092	219.313	211.367
0.63115E+08	221.600	221.580	221.627	226.179	224.430	216.740
0.94673E+08	224.817	224.797	224.843	229.244	227.527	220.041
0.12623E+09	227.201	227.182	227.226	231.497	229.811	222.508
0.15779E+09	229.129	229.110	229.154	233.308	231.652	224.519
0.18935E+09	230.674	230.655	230.698	234.749	233.121	226.145
0.22090E+09	231.796	231.778	231.820	235.778	234.179	227.346
0.25246E+09	232.781	232.764	232.805	236.676	235.104	228.408
0.28402E+09	233.044	233.027	233.067	236.866	235.321	228.745
0.31558E+09	233.207	233.189	233.229	236.963	235.442	228.979
0.63115E+09	233.588	233.573	233.607	236.800	235.496	229.971
0.94673E+09	233.443	233.430	233.459	236.261	235.116	230.273
0.12623E+10	230.794	230.782	230.809	233.347	232.322	227.960
0.15779E+10	227.723	227.712	227.737	230.084	229.149	225.144
0.18935E+10	224.701	224.691	224.714	226.915	226.050	222.321
0.22090E+10	221.784	221.775	221.796	223.883	223.075	219.560
0.25246E+10	218.606	218.598	218.618	220.615	219.852	216.509
0.28402E+10	215.898	215.890	215.910	217.833	217.108	213.909
0.31558E+10	213.485	213.477	213.496	215.356	214.663	211.585
0.63115E+10	199.020	199.014	199.028	200.478	199.976	197.652
0.94673E+10	189.491	189.486	189.498	190.701	190.304	188.416
0.12623E+11	183.723	183.719	183.729	184.759	184.430	182.835
0.15779E+11	179.827	179.823	179.832	180.741	180.457	179.062
0.18935E+11	176.314	176.311	176.319	177.143	176.891	175.637
0.22090E+11	172.953	172.951	172.957	173.722	173.492	172.338
0.25246E+11	169.595	169.592	169.599	170.314	170.103	169.031
0.28402E+11	166.534	166.531	166.537	167.214	167.018	166.010
0.31558E+11	163.803	163.800	163.806	164.450	164.266	163.314

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.570
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	4073 TEMP s24o000	4137 TEMP t24o000	4865 TEMP g24i000	4860 TEMP g24o000	5019 TEMP m24i000	4946 TEMP m24o000
0.10000E-05	140.546	140.340	129.061	128.887	120.121	119.145
0.20000E-05	161.112	160.913	150.646	150.478	142.334	141.385
31.558	161.112	160.913	150.646	150.478	142.334	141.385
0.31558E+07	178.049	177.859	168.469	168.306	160.742	159.825
0.63116E+07	182.290	182.101	172.883	172.722	165.263	164.349
0.94673E+07	184.957	184.769	175.676	175.515	168.137	167.227
0.12623E+08	186.974	186.788	177.786	177.626	170.312	169.405
0.15779E+08	188.619	188.434	179.517	179.357	172.101	171.197
0.18935E+08	190.010	189.826	180.976	180.817	173.609	172.708
0.22090E+08	191.218	191.034	182.251	182.093	174.930	174.032
0.25246E+08	192.297	192.113	183.381	183.223	176.096	175.200
0.28402E+08	193.237	193.055	184.374	184.217	177.127	176.234
0.31558E+08	194.069	193.887	185.260	185.103	178.051	177.162
0.63115E+08	200.072	199.896	191.649	191.497	184.724	183.859
0.94673E+08	203.862	203.691	195.727	195.579	189.021	188.176
0.12623E+09	206.759	206.591	198.871	198.726	192.355	191.530
0.15779E+09	209.163	208.999	201.499	201.357	195.157	194.350
0.18935E+09	211.145	210.985	203.680	203.541	197.495	196.704
0.22090E+09	212.672	212.515	205.386	205.250	199.344	198.569
0.25246E+09	214.045	213.891	206.928	206.795	201.022	200.262
0.28402E+09	214.650	214.499	207.675	207.544	201.884	201.138
0.31558E+09	215.134	214.986	208.289	208.160	202.606	201.873
0.63115E+09	218.195	218.068	212.414	212.304	207.612	206.988
0.94673E+09	219.991	219.881	214.968	214.872	210.795	210.250
0.12623E+10	218.714	218.615	214.199	214.113	210.456	209.968
0.15779E+10	216.661	216.571	212.516	212.437	209.087	208.641
0.18935E+10	214.427	214.343	210.563	210.490	207.376	206.963
0.22090E+10	212.119	212.040	208.471	208.402	205.468	205.081
0.25246E+10	209.428	209.354	205.949	205.884	203.092	202.726
0.28402E+10	207.128	207.056	203.790	203.728	201.055	200.706
0.31558E+10	205.058	204.990	201.840	201.781	199.209	198.874
0.63115E+10	192.715	192.664	190.256	190.212	188.270	188.023
0.94673E+10	184.396	184.355	182.380	182.344	180.765	180.567
0.12623E+11	179.436	179.401	177.724	177.694	176.360	176.195
0.15779E+11	176.088	176.058	174.587	174.561	173.395	173.251
0.18935E+11	172.960	172.933	171.605	171.582	170.533	170.405
0.22090E+11	169.871	169.846	168.617	168.596	167.629	167.512
0.25246E+11	166.738	166.715	165.568	165.548	164.649	164.541
0.28402E+11	163.852	163.831	162.748	162.730	161.883	161.782
0.31558E+11	161.273	161.253	160.225	160.208	159.407	159.312

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 20:57:16 JUN 26, 1996 CP= 36971.580
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	5435 TEMP i24i000	5508 TEMP i24o000	6022 TEMP o24o000
0.10000E-05	28.9714	27.8909	26.1379
0.20000E-05	72.0421	70.9634	69.2535
31.558	72.0423	70.9634	69.2535
0.31558E+07	103.497	102.454	100.945
0.63116E+07	110.280	109.243	107.733
0.94673E+07	114.636	113.605	112.095
0.12623E+08	117.976	116.952	115.446

0.15779E+08	120.688	119.668	118.164
0.18935E+08	123.000	121.985	120.485
0.22090E+08	125.005	123.995	122.497
0.25246E+08	126.746	125.741	124.247
0.28402E+08	128.314	127.314	125.822
0.31558E+08	129.768	128.772	127.283
0.63115E+08	140.074	139.112	137.648
0.94673E+08	146.804	145.870	144.431
0.12623E+09	152.110	151.200	149.786
0.15779E+09	156.606	155.719	154.328
0.18935E+09	160.396	159.529	158.162
0.22090E+09	163.491	162.643	161.299
0.25246E+09	166.313	165.484	164.163
0.28402E+09	168.062	167.249	165.948
0.31558E+09	169.586	168.789	167.508
0.63115E+09	180.745	180.071	178.967
0.94673E+09	188.020	187.434	186.462
0.12623E+10	190.190	189.666	188.793
0.15779E+10	190.556	190.079	189.281
0.18935E+10	190.133	189.692	188.953
0.22090E+10	189.182	188.768	188.075
0.25246E+10	187.517	187.126	186.470
0.28402E+10	186.078	185.705	185.080
0.31558E+10	184.737	184.380	183.782
0.63115E+10	177.072	176.810	176.371
0.94673E+10	171.490	171.281	170.933
0.12623E+11	168.447	168.272	167.983
0.15779E+11	166.431	166.279	166.030
0.18935E+11	164.222	164.086	163.863
0.22090E+11	161.759	161.635	161.432
0.25246E+11	159.139	159.024	158.836
0.28402E+11	156.650	156.543	156.368
0.31558E+11	154.416	154.314	154.150

 * Temperature Profile from center to lower right (45 deg.) *

VARIABLE 2	IS AT NODE	854	ITEM= TEMP COMP=	NAME= c02i045
VARIABLE 3	IS AT NODE	881	ITEM= TEMP COMP=	NAME= h02o045
VARIABLE 4	IS AT NODE	862	ITEM= TEMP COMP=	NAME= s02o045
VARIABLE 5	IS AT NODE	897	ITEM= TEMP COMP=	NAME= a02o045
VARIABLE 6	IS AT NODE	901	ITEM= TEMP COMP=	NAME= t02o045
VARIABLE 7	IS AT NODE	1952	ITEM= TEMP COMP=	NAME= t07i045
VARIABLE 8	IS AT NODE	1934	ITEM= TEMP COMP=	NAME= a07i045
VARIABLE 9	IS AT NODE	1832	ITEM= TEMP COMP=	NAME= s07i045
VARIABLE 10	IS AT NODE	1859	ITEM= TEMP COMP=	NAME= h07i045
VARIABLE 11	IS AT NODE	1871	ITEM= TEMP COMP=	NAME= c07i045
VARIABLE 12	IS AT NODE	1883	ITEM= TEMP COMP=	NAME= h07o045
VARIABLE 13	IS AT NODE	1816	ITEM= TEMP COMP=	NAME= s07o045
VARIABLE 14	IS AT NODE	1907	ITEM= TEMP COMP=	NAME= a07o045
VARIABLE 15	IS AT NODE	1896	ITEM= TEMP COMP=	NAME= t07o045
VARIABLE 16	IS AT NODE	3415	ITEM= TEMP COMP=	NAME= t16i045
VARIABLE 17	IS AT NODE	3397	ITEM= TEMP COMP=	NAME= a16i045

VARIABLE 18 IS AT NODE 3295 ITEM= TEMP COMP= NAME= s16i045
 VARIABLE 19 IS AT NODE 3322 ITEM= TEMP COMP= NAME= h16i045
 VARIABLE 20 IS AT NODE 3334 ITEM= TEMP COMP= NAME= c16i045
 VARIABLE 21 IS AT NODE 3346 ITEM= TEMP COMP= NAME= h16o045
 VARIABLE 22 IS AT NODE 3279 ITEM= TEMP COMP= NAME= s16o045
 VARIABLE 23 IS AT NODE 3370 ITEM= TEMP COMP= NAME= a16o045
 VARIABLE 24 IS AT NODE 3359 ITEM= TEMP COMP= NAME= t16o045
 VARIABLE 25 IS AT NODE 4698 ITEM= TEMP COMP= NAME= g16i045
 VARIABLE 26 IS AT NODE 5050 ITEM= TEMP COMP= NAME= m16i045
 VARIABLE 27 IS AT NODE 4983 ITEM= TEMP COMP= NAME= m16o045
 VARIABLE 28 IS AT NODE 5472 ITEM= TEMP COMP= NAME= i16i045
 VARIABLE 29 IS AT NODE 5547 ITEM= TEMP COMP= NAME= i16o045
 VARIABLE 30 IS AT NODE 6061 ITEM= TEMP COMP= NAME= o16o045
 Add centers of assemblies 6, 14, 15, 17, 22, 23
 VARIABLE 31 IS AT NODE 1662 ITEM= TEMP COMP= NAME= c06i045
 VARIABLE 32 IS AT NODE 2916 ITEM= TEMP COMP= NAME= c14i045
 VARIABLE 33 IS AT NODE 3125 ITEM= TEMP COMP= NAME= c15i045
 VARIABLE 34 IS AT NODE 2080 ITEM= TEMP COMP= NAME= c17i045
 VARIABLE 35 IS AT NODE 3738 ITEM= TEMP COMP= NAME= c22i045
 VARIABLE 36 IS AT NODE 3933 ITEM= TEMP COMP= NAME= c23i045

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	854 TEMP	c02i045	166.8	0.3156E+11	254.3	0.2525E+09
3	NSOL	881 TEMP	h02o045	166.2	0.3156E+11	250.5	0.2525E+09
4	NSOL	862 TEMP	s02o045	165.2	0.3156E+11	244.3	0.2840E+09
5	NSOL	897 TEMP	a02o045	165.2	0.3156E+11	244.3	0.2840E+09
6	NSOL	901 TEMP	t02o045	165.2	0.3156E+11	244.2	0.2840E+09
7	NSOL	1952 TEMP	t07i045	165.2	0.3156E+11	243.9	0.2840E+09
8	NSOL	1934 TEMP	a07i045	165.2	0.3156E+11	243.9	0.2840E+09
9	NSOL	1832 TEMP	s07i045	165.2	0.3156E+11	243.8	0.2840E+09
10	NSOL	1859 TEMP	h07i045	165.9	0.3156E+11	248.5	0.2525E+09
11	NSOL	1871 TEMP	c07i045	166.3	0.3156E+11	250.6	0.2525E+09
12	NSOL	1883 TEMP	h07o045	165.6	0.3156E+11	245.6	0.2840E+09
13	NSOL	1816 TEMP	s07o045	164.5	0.3156E+11	238.6	0.3156E+09
14	NSOL	1907 TEMP	a07o045	164.5	0.3156E+11	238.4	0.3156E+09
15	NSOL	1896 TEMP	t07o045	164.5	0.3156E+11	238.3	0.3156E+09
16	NSOL	3415 TEMP	t16i045	164.4	0.3156E+11	237.6	0.3156E+09
17	NSOL	3397 TEMP	a16i045	164.4	0.3156E+11	237.5	0.3156E+09
18	NSOL	3295 TEMP	s16i045	164.4	0.3156E+11	237.4	0.3156E+09
19	NSOL	3322 TEMP	h16i045	165.0	0.3156E+11	241.1	0.3156E+09
20	NSOL	3334 TEMP	c16i045	165.2	0.3156E+11	241.9	0.3156E+09
21	NSOL	3346 TEMP	h16o045	164.3	0.3156E+11	235.5	0.6312E+09
22	NSOL	3279 TEMP	s16o045	159.7	0.1000E-05	229.2	0.9467E+09
23	NSOL	3370 TEMP	a16o045	159.6	0.1000E-05	229.1	0.9467E+09
24	NSOL	3359 TEMP	t16o045	159.5	0.1000E-05	229.1	0.9467E+09
25	NSOL	4698 TEMP	g16i045	130.6	0.1000E-05	216.1	0.9467E+09
26	NSOL	5050 TEMP	m16i045	114.1	0.1000E-05	209.0	0.9467E+09
27	NSOL	4983 TEMP	m16o045	113.1	0.1000E-05	208.4	0.9467E+09

28	NSOL	5472	TEMP	i16i045	29.11	0.1000E-05	190.2	0.1578E+10
29	NSOL	5547	TEMP	i16o045	27.88	0.1000E-05	189.7	0.1578E+10
30	NSOL	6061	TEMP	o16o045	26.14	0.1000E-05	188.8	0.1578E+10
31	NSOL	1662	TEMP	c06i045	166.6	0.3156E+11	253.3	0.2525E+09
32	NSOL	2916	TEMP	c14i045	166.3	0.3156E+11	250.3	0.2525E+09
33	NSOL	3125	TEMP	c15i045	165.9	0.3156E+11	247.3	0.2840E+09
34	NSOL	2080	TEMP	c17i045	165.6	0.3156E+11	245.4	0.2840E+09
35	NSOL	3738	TEMP	c22i045	165.5	0.3156E+11	244.1	0.2840E+09
36	NSOL	3933	TEMP	c23i045	164.9	0.3156E+11	239.7	0.3156E+09

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.280
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	854 TEMP c02i045	881 TEMP h02o045	862 TEMP s02o045	897 TEMP a02o045	901 TEMP t02o045	1952 TEMP t07i045
0.10000E-05	194.575	189.188	180.417	180.351	180.294	179.889
0.20000E-05	213.024	207.945	199.691	199.625	199.568	199.172
31.558	213.024	207.945	199.691	199.625	199.568	199.172
0.31558E+07	227.592	222.773	214.945	214.881	214.825	214.444
0.63116E+07	231.416	226.662	218.940	218.876	218.821	218.441
0.94673E+07	233.728	229.022	221.377	221.314	221.258	220.880
0.12623E+08	235.484	230.809	223.215	223.151	223.096	222.720
0.15779E+08	236.868	232.224	224.685	224.622	224.566	224.192
0.18935E+08	238.051	233.431	225.930	225.867	225.812	225.438
0.22090E+08	239.045	234.450	226.993	226.930	226.874	226.502
0.25246E+08	239.964	235.386	227.956	227.893	227.838	227.466
0.28402E+08	240.728	236.170	228.772	228.709	228.654	228.284
0.31558E+08	241.376	236.839	229.480	229.417	229.362	228.993
0.63115E+08	245.987	241.597	234.484	234.422	234.368	234.008
0.94673E+08	248.635	244.361	237.438	237.378	237.325	236.972
0.12623E+09	250.502	246.329	239.575	239.516	239.464	239.118
0.15779E+09	251.947	247.863	241.264	241.206	241.155	240.816
0.18935E+09	253.049	249.042	242.584	242.526	242.477	242.144
0.22090E+09	253.753	249.818	243.489	243.433	243.384	243.057
0.25246E+09	254.337	250.470	244.264	244.209	244.161	243.840
0.28402E+09	254.228	250.427	244.328	244.274	244.227	243.912
0.31558E+09	254.039	250.301	244.302	244.249	244.202	243.893
0.63115E+09	251.446	248.242	243.082	243.036	242.997	242.731
0.94673E+09	249.129	246.306	241.762	241.722	241.687	241.454
0.12623E+10	244.913	242.357	238.247	238.211	238.180	237.971
0.15779E+10	240.667	238.310	234.523	234.490	234.462	234.271
0.18935E+10	236.733	234.531	230.993	230.962	230.936	230.759
0.22090E+10	233.107	231.024	227.679	227.651	227.626	227.460
0.25246E+10	229.356	227.368	224.179	224.152	224.129	223.972
0.28402E+10	226.171	224.263	221.203	221.177	221.155	221.005
0.31558E+10	223.351	221.512	218.563	218.538	218.517	218.374
0.63115E+10	206.398	204.992	202.739	202.721	202.706	202.599
0.94673E+10	195.452	194.298	192.453	192.439	192.427	192.342
0.12623E+11	188.741	187.761	186.194	186.183	186.173	186.101
0.15779E+11	184.203	183.344	181.969	181.959	181.950	181.888
0.18935E+11	180.242	179.466	178.226	178.217	178.209	178.154
0.22090E+11	176.564	175.847	174.702	174.694	174.687	174.636
0.25246E+11	172.941	172.274	171.207	171.200	171.193	171.147
0.28402E+11	169.673	169.043	168.040	168.033	168.026	167.983
0.31558E+11	166.764	166.169	165.218	165.211	165.205	165.164

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.290
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1934 TEMP a07i045	1832 TEMP s07i045	1859 TEMP h07i045	1871 TEMP c07i045	1883 TEMP h07o045	1816 TEMP s07o045
0.10000E-05	179.832	179.781	186.829	190.184	183.393	173.324
0.20000E-05	199.114	199.063	205.599	208.650	202.173	192.639
31.558	199.114	199.063	205.599	208.650	202.173	192.639
0.31558E+07	214.388	214.338	220.485	223.320	217.120	208.034
0.63116E+07	218.385	218.335	224.376	227.147	221.010	212.034
0.94673E+07	220.824	220.775	226.743	229.473	223.385	214.489
0.12623E+08	222.663	222.614	228.536	231.237	225.184	216.342
0.15779E+08	224.136	224.086	229.958	232.632	226.615	217.830
0.18935E+08	225.382	225.333	231.169	233.823	227.833	219.090
0.22090E+08	226.446	226.397	232.193	234.827	228.866	220.168
0.25246E+08	227.410	227.361	233.134	235.754	229.813	221.144
0.28402E+08	228.228	228.179	233.923	236.527	230.608	221.976
0.31558E+08	228.937	228.888	234.597	237.184	231.290	222.698
0.63115E+08	233.954	233.906	239.399	241.874	236.155	227.840
0.94673E+08	236.919	236.872	242.204	244.597	239.020	230.923
0.12623E+09	239.066	239.019	244.212	246.536	241.085	233.182
0.15779E+09	240.765	240.719	245.785	248.048	242.715	234.990
0.18935E+09	242.094	242.049	247.000	249.209	243.984	236.423
0.22090E+09	243.008	242.964	247.812	249.972	244.848	237.438
0.25246E+09	243.791	243.748	248.499	250.614	245.586	238.319
0.28402E+09	243.864	243.821	248.489	250.567	245.625	238.485
0.31558E+09	243.846	243.804	248.395	250.439	245.577	238.557
0.63115E+09	242.691	242.655	246.606	248.369	244.188	238.163
0.94673E+09	241.419	241.388	244.869	246.426	242.746	237.450
0.12623E+10	237.940	237.912	241.068	242.487	239.165	234.387
0.15779E+10	234.242	234.217	237.134	238.452	235.397	231.004
0.18935E+10	230.733	230.709	233.442	234.683	231.836	227.739
0.22090E+10	227.435	227.413	230.003	231.185	228.499	224.634
0.25246E+10	223.948	223.928	226.404	227.539	224.982	221.303
0.28402E+10	220.983	220.963	223.345	224.440	221.992	218.467
0.31558E+10	218.352	218.333	220.633	221.694	219.338	215.946
0.63115E+10	202.584	202.570	204.348	205.184	203.402	200.831
0.94673E+10	192.329	192.318	193.785	194.484	193.033	190.937
0.12623E+11	186.091	186.082	187.333	187.933	186.706	184.931
0.15779E+11	181.879	181.872	182.973	183.504	182.430	180.875
0.18935E+11	178.146	178.139	179.135	179.617	178.650	177.251
0.22090E+11	174.629	174.622	175.545	175.993	175.102	173.811
0.25246E+11	171.140	171.134	171.995	172.414	171.586	170.387
0.28402E+11	167.977	167.971	168.783	169.181	168.402	167.274
0.31558E+11	165.158	165.153	165.924	166.302	165.566	164.499

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.310
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1907 TEMP a07o045	1896 TEMP t07o045	3415 TEMP t16i045	3397 TEMP a16i045	3295 TEMP s16i045	3322 TEMP h16i045
0.10000E-05	173.186	173.058	172.145	172.016	171.893	177.964
0.20000E-05	192.501	192.372	191.475	191.346	191.223	196.757
31.558	192.501	192.372	191.475	191.346	191.223	196.757
0.31558E+07	207.898	207.771	206.898	206.770	206.648	211.786
0.63116E+07	211.897	211.770	210.900	210.772	210.650	215.675
0.94673E+07	214.353	214.226	213.359	213.232	213.110	218.062

0.12623E+08	216.206	216.079	215.215	215.088	214.966	219.870
0.15779E+08	217.694	217.567	216.707	216.580	216.458	221.313
0.18935E+08	218.954	218.828	217.970	217.843	217.721	222.542
0.22090E+08	220.033	219.907	219.052	218.925	218.804	223.586
0.25246E+08	221.009	220.883	220.030	219.904	219.782	224.542
0.28402E+08	221.841	221.715	220.865	220.738	220.617	225.350
0.31558E+08	222.563	222.438	221.590	221.464	221.343	226.043
0.63115E+08	227.708	227.584	226.756	226.632	226.514	231.010
0.94673E+08	230.793	230.672	229.862	229.740	229.624	233.971
0.12623E+09	233.055	232.936	232.142	232.022	231.908	236.128
0.15779E+09	234.865	234.749	233.970	233.853	233.740	237.846
0.18935E+09	236.300	236.185	235.421	235.306	235.196	239.200
0.22090E+09	237.317	237.205	236.454	236.341	236.233	240.147
0.25246E+09	238.201	238.090	237.353	237.242	237.136	240.965
0.28402E+09	238.369	238.260	237.536	237.427	237.322	241.082
0.31558E+09	238.442	238.335	237.623	237.516	237.413	241.108
0.63115E+09	238.065	237.974	237.364	237.272	237.184	240.352
0.94673E+09	237.364	237.284	236.750	236.669	236.592	239.376
0.12623E+10	234.310	234.238	233.759	233.687	233.618	236.144
0.15779E+10	230.934	230.869	230.431	230.366	230.303	232.642
0.18935E+10	227.675	227.615	227.209	227.149	227.090	229.287
0.22090E+10	224.517	224.517	224.136	224.080	224.026	226.111
0.25246E+10	221.246	221.193	220.833	220.779	220.728	222.725
0.28402E+10	218.413	218.363	218.020	217.969	217.920	219.845
0.31558E+10	215.894	215.846	215.517	215.469	215.422	217.284
0.63115E+10	200.793	200.758	200.516	200.481	200.447	201.902
0.94673E+10	190.907	190.879	190.686	190.658	190.631	191.839
0.12623E+11	184.907	184.884	184.722	184.699	184.676	185.711
0.15779E+11	180.854	180.834	180.693	180.673	180.654	181.567
0.18935E+11	177.232	177.214	177.088	177.071	177.054	177.881
0.22090E+11	173.793	173.777	173.662	173.646	173.630	174.398
0.25246E+11	170.371	170.356	170.250	170.235	170.220	170.938
0.28402E+11	167.259	167.245	167.146	167.132	167.119	167.798
0.31558E+11	164.485	164.471	164.378	164.365	164.353	164.999

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.320
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	3334 TEMP c16i045	3346 TEMP h16o045	3279 TEMP s16o045	3370 TEMP a16o045	3359 TEMP t16o045	4698 TEMP g16i045
0.10000E-05	179.829	171.097	159.745	159.618	159.504	130.558
0.20000E-05	198.305	189.915	179.147	179.022	178.910	152.379
31.558	198.305	189.915	179.146	179.022	178.909	152.379
0.31558E+07	213.121	205.046	194.771	194.650	194.540	170.062
0.63116E+07	216.942	208.937	198.784	198.663	198.554	174.502
0.94673E+07	219.288	211.337	201.273	201.153	201.044	177.310
0.12623E+08	221.070	213.159	203.159	203.039	202.930	179.430
0.15779E+08	222.489	214.617	204.679	204.560	204.452	181.168
0.18935E+08	223.699	215.859	205.971	205.852	205.744	182.632
0.22090E+08	224.726	216.918	207.080	206.961	206.853	183.909
0.25246E+08	225.670	217.886	208.083	207.964	207.857	185.040
0.28402E+08	226.464	218.707	208.945	208.826	208.719	186.035
0.31558E+08	227.142	219.413	209.694	209.576	209.469	186.921
0.63115E+08	232.021	224.512	215.104	214.989	214.885	193.305
0.94673E+08	234.925	227.598	218.439	218.327	218.225	197.369
0.12623E+09	237.035	229.873	220.937	220.826	220.727	200.493
0.15779E+09	238.714	231.705	222.976	222.868	222.770	203.098
0.18935E+09	240.035	233.167	224.627	224.521	224.425	205.255
0.22090E+09	240.954	234.219	225.854	225.749	225.656	206.938
0.25246E+09	241.747	235.139	226.940	226.838	226.746	208.455
0.28402E+09	241.848	235.354	227.303	227.203	227.112	209.178

0.31558E+09	241.860	235.474	227.561	227.462	227.373	209.768
0.63115E+09	240.994	235.516	228.752	228.668	228.592	213.685
0.94673E+09	239.941	235.130	229.204	229.130	229.064	216.083
0.12623E+10	236.670	232.339	227.004	226.938	226.878	215.197
0.15779E+10	233.142	229.169	224.273	224.213	224.159	213.423
0.18935E+10	229.768	226.074	221.518	221.463	221.412	211.400
0.22090E+10	226.579	223.100	218.808	218.756	218.709	209.251
0.25246E+10	223.185	219.881	215.802	215.752	215.708	206.684
0.28402E+10	220.297	217.139	213.236	213.189	213.147	204.486
0.31558E+10	217.729	214.696	210.941	210.896	210.855	202.504
0.63115E+10	202.285	200.011	197.181	197.147	197.118	190.727
0.94673E+10	192.175	190.334	188.034	188.008	187.984	182.740
0.12623E+11	186.007	184.456	182.513	182.491	182.471	178.016
0.15779E+11	181.834	180.479	178.781	178.761	178.744	174.834
0.18935E+11	178.128	176.911	175.382	175.365	175.350	171.822
0.22090E+11	174.631	173.511	172.105	172.089	172.075	168.812
0.25246E+11	171.159	170.121	168.815	168.800	168.787	165.744
0.28402E+11	168.010	167.035	165.806	165.792	165.780	162.910
0.31558E+11	165.202	164.282	163.121	163.109	163.097	160.374

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.330
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	5050 TEMP m16i045	4983 TEMP m16o045	5472 TEMP i16i045	5547 TEMP i16o045	6061 TEMP o16o045	1662 TEMP c06i045
0.10000E-05	114.142	113.115	29.1127	27.8765	26.1379	193.413
0.20000E-05	137.486	136.457	72.1622	70.9257	69.2232	211.864
31.558	137.486	136.457	72.1625	70.9257	69.2232	211.864
0.31558E+07	156.359	155.339	102.471	101.291	99.6174	226.435
0.63116E+07	161.044	160.022	109.247	108.074	106.397	230.258
0.94673E+07	164.032	163.010	113.614	112.446	110.770	232.573
0.12623E+08	166.289	165.268	116.960	115.799	114.127	234.331
0.15779E+08	168.152	167.132	119.681	118.525	116.855	235.717
0.18935E+08	169.719	168.700	121.999	120.848	119.182	236.901
0.22090E+08	171.095	170.078	124.011	122.865	121.201	237.898
0.25246E+08	172.301	171.286	125.752	124.611	122.951	238.819
0.28402E+08	173.375	172.361	127.325	126.189	124.532	239.585
0.31558E+08	174.341	173.329	128.783	127.652	125.997	240.235
0.63115E+08	181.302	180.309	139.138	138.044	136.420	244.866
0.94673E+08	185.794	184.820	145.914	144.850	143.255	247.534
0.12623E+09	189.285	188.329	151.254	150.217	148.651	249.419
0.15779E+09	192.220	191.282	155.777	154.765	153.226	250.879
0.18935E+09	194.670	193.750	159.589	158.599	157.087	251.995
0.22090E+09	196.615	195.711	162.705	161.737	160.251	252.716
0.25246E+09	198.379	197.492	165.546	164.598	163.137	253.315
0.28402E+09	199.309	198.436	167.318	166.389	164.952	253.223
0.31558E+09	200.089	199.231	168.861	167.949	166.536	253.050
0.63115E+09	205.545	204.813	180.163	179.392	178.179	250.603
0.94673E+09	209.032	208.391	187.536	186.864	185.800	248.389
0.12623E+10	208.873	208.300	189.780	189.179	188.227	244.250
0.15779E+10	207.624	207.102	190.198	189.651	188.785	240.063
0.18935E+10	206.000	205.519	189.815	189.310	188.510	236.174
0.22090E+10	204.157	203.706	188.893	188.420	187.671	232.584
0.25246E+10	201.828	201.403	187.256	186.809	186.103	228.862
0.28402E+10	199.829	199.425	185.836	185.411	184.741	225.701
0.31558E+10	198.016	197.630	184.511	184.104	183.464	222.901
0.63115E+10	187.306	187.026	176.933	176.635	176.171	206.070
0.94673E+10	179.938	179.716	171.378	171.140	170.773	195.191
0.12623E+11	175.638	175.454	168.350	168.151	167.846	188.523
0.15779E+11	172.751	172.591	166.345	166.173	165.909	184.015
0.18935E+11	169.943	169.802	164.146	163.992	163.757	180.074

0.22090E+11	167.076	166.947	161.692	161.551	161.337	176.410
0.25246E+11	164.126	164.007	159.078	158.948	158.751	172.799
0.28402E+11	161.383	161.273	156.595	156.473	156.290	169.541
0.31558E+11	158.927	158.824	154.364	154.250	154.078	166.640

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:21 JUN 26, 1996 CP= 36976.340
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2916 TEMP	3125 TEMP	2080 TEMP	3738 TEMP	3933 TEMP
	c14i045	c15i045	c17i045	c22i045	c23i045
0.10000E-05	189.957	186.356	183.985	182.587	176.800
0.20000E-05	208.413	204.834	202.456	201.087	195.437
31.558	208.413	204.834	202.456	201.087	195.437
0.31558E+07	222.994	219.526	217.246	215.739	210.315
0.63116E+07	226.814	223.350	221.071	219.559	214.162
0.94673E+07	229.137	225.684	223.410	221.900	216.532
0.12623E+08	230.900	227.456	225.186	223.678	218.330
0.15779E+08	232.294	228.860	226.596	225.091	219.766
0.18935E+08	233.484	230.058	227.799	226.297	220.989
0.22090E+08	234.488	231.071	228.817	227.318	222.029
0.25246E+08	235.414	232.004	229.754	228.257	222.982
0.28402E+08	236.187	232.784	230.540	229.045	223.787
0.31558E+08	236.843	233.449	231.209	229.717	224.476
0.63115E+08	241.533	238.208	236.011	234.547	229.441
0.94673E+08	244.260	240.999	238.841	237.405	232.414
0.12623E+09	246.202	243.001	240.882	239.472	234.585
0.15779E+09	247.717	244.574	242.493	241.107	236.320
0.18935E+09	248.882	245.795	243.750	242.386	237.691
0.22090E+09	249.650	246.616	244.606	243.265	238.657
0.25246E+09	250.295	247.314	245.338	244.017	239.495
0.28402E+09	250.253	247.322	245.379	244.080	239.635
0.31558E+09	250.130	247.246	245.334	244.056	239.684
0.63115E+09	248.103	245.625	243.981	242.878	239.128
0.94673E+09	246.192	244.014	242.568	241.596	238.302
0.12623E+10	242.280	240.324	239.026	238.154	235.193
0.15779E+10	238.266	236.478	235.292	234.497	231.784
0.18935E+10	234.513	232.857	231.758	231.022	228.504
0.22090E+10	231.028	229.474	228.444	227.755	225.387
0.25246E+10	227.392	225.922	224.946	224.297	222.051
0.28402E+10	224.302	222.901	221.972	221.355	219.211
0.31558E+10	221.564	220.222	219.333	218.742	216.685
0.63115E+10	205.095	204.109	203.456	203.025	201.497
0.94673E+10	194.414	193.627	193.108	192.761	191.532
0.12623E+11	187.875	187.218	186.785	186.493	185.462
0.15779E+11	183.454	182.884	182.509	182.254	181.357
0.18935E+11	179.573	179.064	178.730	178.502	177.698
0.22090E+11	175.953	175.487	175.181	174.972	174.235
0.25246E+11	172.378	171.948	171.666	171.474	170.792
0.28402E+11	169.147	168.746	168.483	168.303	167.664
0.31558E+11	166.271	165.893	165.646	165.477	164.876

 * Temperature Profile from center to side of WP (90 deg.) *

VARIABLE 2 IS AT NODE 924 ITEM= TEMP COMP= NAME= c01i090
 VARIABLE 3 IS AT NODE 928 ITEM= TEMP COMP= NAME= h01o090
 VARIABLE 4 IS AT NODE 453 ITEM= TEMP COMP= NAME= s01o090
 VARIABLE 5 IS AT NODE 930 ITEM= TEMP COMP= NAME= a01o090

VARIABLE 6	IS AT NODE	926	ITEM= TEMP COMP=	NAME= t01o090
VARIABLE 7	IS AT NODE	484	ITEM= TEMP COMP=	NAME= t05i090
VARIABLE 8	IS AT NODE	492	ITEM= TEMP COMP=	NAME= a05i090
VARIABLE 9	IS AT NODE	491	ITEM= TEMP COMP=	NAME= s05i090
VARIABLE 10	IS AT NODE	490	ITEM= TEMP COMP=	NAME= h05i090
VARIABLE 11	IS AT NODE	488	ITEM= TEMP COMP=	NAME= c05i090
VARIABLE 12	IS AT NODE	1749	ITEM= TEMP COMP=	NAME= h05o090
VARIABLE 13	IS AT NODE	485	ITEM= TEMP COMP=	NAME= s05o090
VARIABLE 14	IS AT NODE	493	ITEM= TEMP COMP=	NAME= a05o090
VARIABLE 15	IS AT NODE	483	ITEM= TEMP COMP=	NAME= t05i090
VARIABLE 16	IS AT NODE	2315	ITEM= TEMP COMP=	NAME= t13i090
VARIABLE 17	IS AT NODE	2324	ITEM= TEMP COMP=	NAME= a13i090
VARIABLE 18	IS AT NODE	2322	ITEM= TEMP COMP=	NAME= s13i090
VARIABLE 19	IS AT NODE	2321	ITEM= TEMP COMP=	NAME= h13i090
VARIABLE 20	IS AT NODE	2319	ITEM= TEMP COMP=	NAME= c13i090
VARIABLE 21	IS AT NODE	3003	ITEM= TEMP COMP=	NAME= h13o090
VARIABLE 22	IS AT NODE	2316	ITEM= TEMP COMP=	NAME= s13o090
VARIABLE 23	IS AT NODE	2333	ITEM= TEMP COMP=	NAME= a13o090
VARIABLE 26	IS AT NODE	2315	ITEM= TEMP COMP=	NAME= t13i090
VARIABLE 27	IS AT NODE	574	ITEM= TEMP COMP=	NAME= t21i090
VARIABLE 28	IS AT NODE	582	ITEM= TEMP COMP=	NAME= a21i090
VARIABLE 29	IS AT NODE	581	ITEM= TEMP COMP=	NAME= s21i090
VARIABLE 30	IS AT NODE	3829	ITEM= TEMP COMP=	NAME= h21i090
VARIABLE 31	IS AT NODE	578	ITEM= TEMP COMP=	NAME= c21i090
VARIABLE 32	IS AT NODE	576	ITEM= TEMP COMP=	NAME= h21o090
VARIABLE 33	IS AT NODE	573	ITEM= TEMP COMP=	NAME= s21o090
VARIABLE 34	IS AT NODE	573	ITEM= TEMP COMP=	NAME= t21o090
VARIABLE 35	IS AT NODE	4555	ITEM= TEMP COMP=	NAME= g04i090
VARIABLE 36	IS AT NODE	4516	ITEM= TEMP COMP=	NAME= g04o090
VARIABLE 37	IS AT NODE	4625	ITEM= TEMP COMP=	NAME= m04i090
VARIABLE 38	IS AT NODE	4873	ITEM= TEMP COMP=	NAME= m04o090
VARIABLE 39	IS AT NODE	5432	ITEM= TEMP COMP=	NAME= i04i090
VARIABLE 40	IS AT NODE	5431	ITEM= TEMP COMP=	NAME= i04o090
VARIABLE 41	IS AT NODE	6019	ITEM= TEMP COMP=	NAME= o04o090

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	924 TEMP	c01i090	165.4	0.3156E+11	245.8	0.2840E+09
3 NSOL	928 TEMP	h01o090	165.4	0.3156E+11	245.7	0.2840E+09
4 NSOL	453 TEMP	s01o090	165.4	0.3156E+11	245.5	0.2840E+09
5 NSOL	930 TEMP	a01o090	165.4	0.3156E+11	245.4	0.2840E+09
6 NSOL	926 TEMP	t01o090	165.4	0.3156E+11	245.4	0.2840E+09
7 NSOL	484 TEMP	t05i090	165.3	0.3156E+11	245.3	0.2840E+09
8 NSOL	492 TEMP	a05i090	165.3	0.3156E+11	245.3	0.2840E+09
9 NSOL	491 TEMP	s05i090	165.3	0.3156E+11	245.3	0.2840E+09
10 NSOL	490 TEMP	h05i090	165.3	0.3156E+11	245.1	0.2840E+09
11 NSOL	488 TEMP	c05i090	165.3	0.3156E+11	244.8	0.2840E+09
12 NSOL	1749 TEMP	h05o090	165.2	0.3156E+11	244.2	0.2840E+09
13 NSOL	485 TEMP	s05o090	165.2	0.3156E+11	243.8	0.2840E+09
14 NSOL	493 TEMP	a05o090	165.1	0.3156E+11	243.5	0.2840E+09
15 NSOL	483 TEMP	t05i090	165.1	0.3156E+11	243.5	0.2840E+09
16 NSOL	2315 TEMP	t13i090	165.1	0.3156E+11	243.2	0.2840E+09
17 NSOL	2324 TEMP	a13i090	165.1	0.3156E+11	243.2	0.2840E+09
18 NSOL	2322 TEMP	s13i090	165.1	0.3156E+11	243.0	0.2840E+09
19 NSOL	2321 TEMP	h13i090	165.0	0.3156E+11	242.6	0.3156E+09
20 NSOL	2319 TEMP	c13i090	164.9	0.3156E+11	241.8	0.3156E+09
21 NSOL	3003 TEMP	h13o090	164.8	0.3156E+11	240.8	0.3156E+09
22 NSOL	2316 TEMP	s13o090	164.7	0.3156E+11	240.1	0.3156E+09
23 NSOL	2333 TEMP	a13o090	164.7	0.3156E+11	239.7	0.3156E+09
26 NSOL	2315 TEMP	t13i090	165.1	0.3156E+11	243.2	0.2840E+09
27 NSOL	574 TEMP	t21i090	164.6	0.3156E+11	239.3	0.3156E+09
28 NSOL	582 TEMP	a21i090	164.6	0.3156E+11	239.3	0.3156E+09
29 NSOL	581 TEMP	s21i090	164.6	0.3156E+11	239.0	0.3156E+09
30 NSOL	3829 TEMP	h21i090	164.5	0.3156E+11	238.4	0.3156E+09
31 NSOL	578 TEMP	c21i090	164.4	0.3156E+11	237.4	0.3156E+09
32 NSOL	576 TEMP	h21o090	164.2	0.3156E+11	236.1	0.3156E+09
33 NSOL	573 TEMP	s21o090	164.1	0.3156E+11	235.0	0.6312E+09
34 NSOL	573 TEMP	t21o090	164.1	0.3156E+11	235.0	0.6312E+09
35 NSOL	4555 TEMP	g04i090	142.1	0.1000E-05	221.2	0.9467E+09
36 NSOL	4516 TEMP	g04o090	141.0	0.1000E-05	220.6	0.9467E+09
37 NSOL	4625 TEMP	m04i090	111.0	0.1000E-05	207.6	0.1262E+10
38 NSOL	4873 TEMP	m04o090	108.5	0.1000E-05	206.5	0.1262E+10
39 NSOL	5432 TEMP	i04i090	28.87	0.1000E-05	189.6	0.1578E+10
40 NSOL	5431 TEMP	i04o090	27.73	0.1000E-05	189.1	0.1578E+10
41 NSOL	6019 TEMP	o04o090	26.14	0.1000E-05	188.3	0.1578E+10

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.450
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	924 TEMP c01i090	928 TEMP h01o090	453 TEMP s01o090	930 TEMP a01o090	926 TEMP t01o090	484 TEMP t05i090
0.10000E-05	182.255	182.121	181.969	181.854	181.846	181.740
0.20000E-05	201.514	201.381	201.230	201.116	201.107	201.004
31.558	201.514	201.381	201.230	201.116	201.107	201.004
0.31558E+07	216.677	216.545	216.394	216.286	216.277	216.168
0.63116E+07	220.668	220.536	220.384	220.277	220.268	220.159
0.94673E+07	223.099	222.967	222.816	222.709	222.700	222.591
0.12623E+08	224.932	224.801	224.649	224.543	224.534	224.426
0.15779E+08	226.397	226.266	226.115	226.009	226.000	225.892
0.18935E+08	227.638	227.507	227.357	227.250	227.241	227.134
0.22090E+08	228.695	228.565	228.415	228.309	228.300	228.193
0.25246E+08	229.654	229.524	229.375	229.269	229.260	229.153
0.28402E+08	230.466	230.337	230.187	230.082	230.073	229.966
0.31558E+08	231.170	231.040	230.891	230.786	230.777	230.670

0.63115E+08	236.137	236.010	235.864	235.761	235.752	235.648
0.94673E+08	239.058	238.934	238.790	238.689	238.681	238.578
0.12623E+09	241.164	241.042	240.901	240.802	240.793	240.693
0.15779E+09	242.822	242.702	242.564	242.467	242.459	242.360
0.18935E+09	244.113	243.995	243.859	243.764	243.756	243.659
0.22090E+09	244.990	244.875	244.741	244.648	244.640	244.544
0.25246E+09	245.738	245.625	245.493	245.402	245.394	245.300
0.28402E+09	245.777	245.666	245.537	245.446	245.439	245.347
0.31558E+09	245.727	245.617	245.491	245.402	245.394	245.304
0.63115E+09	244.301	244.207	244.099	244.023	244.016	243.938
0.94673E+09	242.830	242.748	242.653	242.586	242.581	242.512
0.12623E+10	239.205	239.131	239.046	238.986	238.981	238.920
0.15779E+10	235.398	235.330	235.253	235.198	235.194	235.138
0.18935E+10	231.802	231.740	231.668	231.618	231.614	231.562
0.22090E+10	228.438	228.379	228.312	228.265	228.261	228.213
0.25246E+10	224.896	224.842	224.778	224.734	224.730	224.685
0.28402E+10	221.886	221.834	221.774	221.731	221.728	221.684
0.31558E+10	219.217	219.167	219.109	219.069	219.065	219.024
0.63115E+10	203.218	203.182	203.140	203.110	203.108	203.078
0.94673E+10	192.834	192.805	192.772	192.748	192.746	192.722
0.12623E+11	186.512	186.488	186.460	186.440	186.439	186.419
0.15779E+11	182.244	182.223	182.199	182.182	182.181	182.163
0.18935E+11	178.471	178.453	178.431	178.416	178.415	178.399
0.22090E+11	174.926	174.909	174.890	174.876	174.875	174.860
0.25246E+11	171.414	171.399	171.381	171.368	171.367	171.354
0.28402E+11	168.233	168.218	168.202	168.190	168.189	168.176
0.31558E+11	165.399	165.386	165.370	165.359	165.358	165.346

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.460
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	492 TEMP a05i090	491 TEMP s05i090	490 TEMP h05i090	488 TEMP c05i090	1749 TEMP h05o090	485 TEMP s05o090
0.10000E-05	181.732	181.646	181.503	181.053	180.334	179.887
0.20000E-05	200.995	200.910	200.767	200.317	199.601	199.156
31.558	200.995	200.910	200.767	200.317	199.601	199.156
0.31558E+07	216.159	216.076	215.935	215.487	214.776	214.332
0.63116E+07	220.150	220.067	219.926	219.478	218.766	218.321
0.94673E+07	222.582	222.499	222.358	221.911	221.201	220.757
0.12623E+08	224.417	224.334	224.193	223.746	223.037	222.594
0.15779E+08	225.883	225.800	225.659	225.214	224.506	224.065
0.18935E+08	227.125	227.042	226.902	226.457	225.751	225.310
0.22090E+08	228.184	228.101	227.961	227.517	226.813	226.373
0.25246E+08	229.144	229.062	228.921	228.478	227.775	227.336
0.28402E+08	229.957	229.875	229.735	229.293	228.591	228.153
0.31558E+08	230.661	230.579	230.440	229.998	229.298	228.860
0.63115E+08	235.639	235.559	235.422	234.988	234.301	233.872
0.94673E+08	238.570	238.491	238.356	237.931	237.257	236.836
0.12623E+09	240.684	240.607	240.475	240.057	239.395	238.982
0.15779E+09	242.352	242.275	242.146	241.736	241.086	240.681
0.18935E+09	243.651	243.576	243.448	243.046	242.408	242.009
0.22090E+09	244.536	244.463	244.338	243.942	243.315	242.923
0.25246E+09	245.292	245.220	245.097	244.708	244.092	243.707
0.28402E+09	245.339	245.268	245.147	244.765	244.159	243.781
0.31558E+09	245.296	245.226	245.107	244.731	244.136	243.764
0.63115E+09	243.932	243.872	243.770	243.448	242.938	242.620
0.94673E+09	242.507	242.454	242.365	242.083	241.636	241.357
0.12623E+10	238.915	238.868	238.788	238.536	238.136	237.886
0.15779E+10	235.133	235.091	235.018	234.788	234.424	234.196
0.18935E+10	231.558	231.519	231.451	231.239	230.903	230.693
0.22090E+10	228.209	228.172	228.109	227.911	227.596	227.400

0.25246E+10	224.681	224.646	224.587	224.400	224.103	223.917
0.28402E+10	221.681	221.648	221.591	221.414	221.131	220.955
0.31558E+10	219.021	218.989	218.935	218.765	218.495	218.327
0.63115E+10	203.076	203.053	203.014	202.890	202.694	202.572
0.94673E+10	192.720	192.702	192.671	192.574	192.418	192.321
0.12623E+11	186.417	186.402	186.376	186.295	186.165	186.084
0.15779E+11	182.162	182.149	182.126	182.056	181.944	181.874
0.18935E+11	178.398	178.386	178.367	178.304	178.204	178.141
0.22090E+11	174.859	174.849	174.831	174.773	174.682	174.625
0.25246E+11	171.353	171.343	171.326	171.274	171.190	171.137
0.28402E+11	168.175	168.166	168.151	168.102	168.023	167.974
0.31558E+11	165.345	165.337	165.322	165.276	165.203	165.157

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.470
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	493 TEMP a05o090	483 TEMP t05i090	2315 TEMP t13i090	2324 TEMP a13i090	2322 TEMP s13i090	2321 TEMP h13i090
0.10000E-05	179.572	179.547	179.238	179.213	178.939	178.520
0.20000E-05	198.842	198.818	198.513	198.488	198.215	197.796
31.558	198.842	198.818	198.513	198.488	198.215	197.796
0.31558E+07	214.018	213.994	213.694	213.669	213.398	212.983
0.63116E+07	218.007	217.983	217.685	217.659	217.388	216.972
0.94673E+07	220.444	220.420	220.122	220.097	219.827	219.411
0.12623E+08	222.281	222.258	221.961	221.936	221.666	221.251
0.15779E+08	223.752	223.729	223.433	223.408	223.138	222.724
0.18935E+08	224.998	224.975	224.680	224.655	224.386	223.972
0.22090E+08	226.062	226.038	225.744	225.719	225.451	225.038
0.25246E+08	227.025	227.002	226.708	226.683	226.415	226.003
0.28402E+08	227.843	227.819	227.527	227.502	227.234	226.823
0.31558E+08	228.551	228.528	228.236	228.211	227.944	227.533
0.63115E+08	233.569	233.546	233.261	233.236	232.974	232.571
0.94673E+08	236.538	236.516	236.236	236.212	235.955	235.559
0.12623E+09	238.690	238.668	238.394	238.370	238.117	237.729
0.15779E+09	240.394	240.372	240.103	240.080	239.831	239.450
0.18935E+09	241.727	241.706	241.442	241.419	241.175	240.800
0.22090E+09	242.646	242.625	242.366	242.344	242.104	241.736
0.25246E+09	243.435	243.414	243.159	243.137	242.902	242.540
0.28402E+09	243.513	243.493	243.243	243.221	242.990	242.634
0.31558E+09	243.501	243.481	243.235	243.213	242.986	242.636
0.63115E+09	242.394	242.377	242.166	242.148	241.953	241.654
0.94673E+09	241.159	241.144	240.959	240.943	240.772	240.510
0.12623E+10	237.710	237.696	237.530	237.516	237.363	237.129
0.15779E+10	234.035	234.023	233.872	233.859	233.720	233.506
0.18935E+10	230.544	230.533	230.393	230.381	230.252	230.055
0.22090E+10	227.261	227.250	227.119	227.108	226.987	226.803
0.25246E+10	223.786	223.776	223.652	223.641	223.528	223.354
0.28402E+10	220.831	220.821	220.703	220.693	220.585	220.420
0.31558E+10	218.208	218.199	218.086	218.076	217.973	217.815
0.63115E+10	202.485	202.479	202.395	202.389	202.314	202.199
0.94673E+10	192.252	192.247	192.181	192.175	192.116	192.025
0.12623E+11	186.027	186.023	185.967	185.963	185.914	185.838
0.15779E+11	181.824	181.821	181.772	181.768	181.726	181.660
0.18935E+11	178.097	178.094	178.051	178.047	178.009	177.951
0.22090E+11	174.585	174.582	174.542	174.539	174.504	174.451
0.25246E+11	171.100	171.097	171.061	171.058	171.026	170.977
0.28402E+11	167.940	167.937	167.903	167.900	167.871	167.825
0.31558E+11	165.124	165.122	165.090	165.087	165.059	165.016

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.480
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2319 TEMP c13i090	3003 TEMP h13o090	2316 TEMP s13o090	2333 TEMP a13o090	3359 TEMP t16o045	4698 TEMP g16i045
0.10000E-05	177.522	176.257	175.534	175.035	159.504	130.558
0.20000E-05	196.801	195.539	194.818	194.320	178.910	152.379
31.558	196.801	195.539	194.818	194.320	178.909	152.379
0.31558E+07	211.991	210.737	210.018	209.521	194.540	170.062
0.63116E+07	215.980	214.724	214.005	213.508	198.554	174.502
0.94673E+07	218.420	217.167	216.449	215.953	201.044	177.310
0.12623E+08	220.262	219.011	218.294	217.798	202.930	179.430
0.15779E+08	221.737	220.489	219.774	219.279	204.452	181.168
0.18935E+08	222.987	221.741	221.027	220.533	205.744	182.632
0.22090E+08	224.055	222.811	222.099	221.606	206.853	183.909
0.25246E+08	225.022	223.780	223.069	222.577	207.857	185.040
0.28402E+08	225.843	224.604	223.894	223.404	208.719	186.035
0.31558E+08	226.555	225.319	224.610	224.120	209.469	186.921
0.63115E+08	231.611	230.398	229.703	229.222	214.885	193.305
0.94673E+08	234.617	233.427	232.745	232.273	218.225	197.369
0.12623E+09	236.804	235.635	234.966	234.502	220.727	200.493
0.15779E+09	238.542	237.394	236.737	236.282	222.770	203.098
0.18935E+09	239.908	238.780	238.135	237.688	224.425	205.255
0.22090E+09	240.859	239.751	239.116	238.677	225.656	206.938
0.25246E+09	241.678	240.589	239.966	239.534	226.746	208.455
0.28402E+09	241.787	240.717	240.104	239.680	227.112	209.178
0.31558E+09	241.803	240.750	240.148	239.731	227.373	209.768
0.63115E+09	240.940	240.039	239.523	239.166	228.592	213.685
0.94673E+09	239.884	239.094	238.642	238.329	229.064	216.083
0.12623E+10	236.569	235.863	235.458	235.178	226.878	215.197
0.15779E+10	232.997	232.353	231.985	231.730	224.159	213.423
0.18935E+10	229.584	228.990	228.650	228.415	221.412	211.400
0.22090E+10	226.363	225.807	225.489	225.269	218.709	209.251
0.25246E+10	222.939	222.415	222.115	221.907	215.708	206.684
0.28402E+10	220.026	219.527	219.242	219.045	213.147	204.486
0.31558E+10	217.438	216.962	216.689	216.501	210.855	202.504
0.63115E+10	201.926	201.580	201.382	201.246	197.118	190.727
0.94673E+10	191.809	191.534	191.377	191.269	187.984	182.740
0.12623E+11	185.658	185.430	185.299	185.208	182.471	178.016
0.15779E+11	181.504	181.307	181.194	181.115	178.744	174.834
0.18935E+11	177.812	177.636	177.535	177.466	175.350	171.822
0.22090E+11	174.324	174.164	174.072	174.008	172.075	168.812
0.25246E+11	170.860	170.712	170.628	170.569	168.787	165.744
0.28402E+11	167.716	167.578	167.499	167.445	165.780	162.910
0.31558E+11	164.914	164.785	164.711	164.660	163.097	160.374

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****

38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.490
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2315 TEMP t13i090	574 TEMP t21i090	582 TEMP a21i090	581 TEMP s21i090	3829 TEMP h21i090	578 TEMP c21i090
0.10000E-05	179.238	174.521	174.485	174.099	173.455	172.230
0.20000E-05	198.513	193.813	193.776	193.388	192.740	191.510
31.558	198.513	193.813	193.776	193.388	192.740	191.510

0.31558E+07	213.694	209.020	208.983	208.596	207.949	206.718
0.63116E+07	217.685	213.008	212.970	212.583	211.934	210.700
0.94673E+07	220.122	215.454	215.416	215.029	214.381	213.148
0.12623E+08	221.961	217.301	217.264	216.877	216.229	214.998
0.15779E+08	223.433	218.783	218.746	218.359	217.712	216.483
0.18935E+08	224.680	220.039	220.001	219.616	218.970	217.742
0.22090E+08	225.744	221.113	221.075	220.690	220.045	218.819
0.25246E+08	226.708	222.085	222.047	221.663	221.019	219.794
0.28402E+08	227.527	222.912	222.875	222.491	221.848	220.626
0.31558E+08	228.236	223.630	223.593	223.209	222.567	221.347
0.63115E+08	233.261	228.743	228.706	228.329	227.698	226.498
0.94673E+08	236.236	231.804	231.767	231.397	230.777	229.598
0.12623E+09	238.394	234.042	234.006	233.642	233.032	231.874
0.15779E+09	240.103	235.830	235.795	235.437	234.838	233.699
0.18935E+09	241.442	237.243	237.209	236.857	236.268	235.149
0.22090E+09	242.366	238.241	238.207	237.861	237.282	236.183
0.25246E+09	243.159	239.106	239.073	238.733	238.163	237.082
0.28402E+09	243.243	239.259	239.226	238.892	238.332	237.269
0.31558E+09	243.235	239.316	239.284	238.956	238.405	237.360
0.63115E+09	242.166	238.811	238.783	238.502	238.030	237.134
0.94673E+09	240.959	238.018	237.994	237.747	237.333	236.548
0.12623E+10	237.530	234.899	234.878	234.657	234.287	233.586
0.15779E+10	233.872	231.476	231.456	231.255	230.919	230.280
0.18935E+10	230.393	228.179	228.161	227.976	227.666	227.077
0.22090E+10	227.119	225.048	225.031	224.858	224.568	224.018
0.25246E+10	223.652	221.699	221.683	221.520	221.246	220.728
0.28402E+10	220.703	218.847	218.832	218.677	218.417	217.925
0.31558E+10	218.086	216.311	216.297	216.149	215.901	215.431
0.63115E+10	202.395	201.107	201.096	200.990	200.811	200.471
0.94673E+10	192.181	191.158	191.150	191.066	190.924	190.655
0.12623E+11	185.967	185.116	185.109	185.039	184.922	184.699
0.15779E+11	181.772	181.035	181.029	180.969	180.867	180.674
0.18935E+11	178.051	177.394	177.389	177.335	177.245	177.073
0.22090E+11	174.542	173.943	173.938	173.889	173.806	173.650
0.25246E+11	171.061	170.509	170.504	170.459	170.384	170.240
0.28402E+11	167.903	167.388	167.384	167.342	167.272	167.137
0.31558E+11	165.090	164.607	164.603	164.563	164.497	164.372

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.500
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	576 TEMP h21o090	573 TEMP s21o090	573 TEMP t21o090	4555 TEMP g04i090	4516 TEMP g04o090	4625 TEMP m04i090
0.10000E-05	170.723	169.297	169.297	142.054	140.978	110.955
0.20000E-05	189.999	188.571	188.571	163.075	162.039	134.743
31.558	189.999	188.571	188.571	163.075	162.039	134.743
0.31558E+07	205.209	203.786	203.786	179.685	178.682	153.395
0.63116E+07	209.189	207.763	207.763	183.973	182.978	158.130
0.94673E+07	211.638	210.215	210.215	186.667	185.679	161.160
0.12623E+08	213.490	212.069	212.069	188.699	187.716	163.450
0.15779E+08	214.977	213.559	213.559	190.359	189.382	165.342
0.18935E+08	216.239	214.823	214.823	191.759	190.786	166.933
0.22090E+08	217.319	215.905	215.905	192.977	192.008	168.332
0.25246E+08	218.297	216.885	216.885	194.056	193.091	169.554
0.28402E+08	219.131	217.722	217.722	195.002	194.040	170.645
0.31558E+08	219.854	218.447	218.447	195.839	194.880	171.629
0.63115E+08	225.031	223.650	223.650	201.860	200.931	178.726
0.94673E+08	228.157	226.801	226.801	205.650	204.744	183.320
0.12623E+09	230.459	229.127	229.127	208.534	207.649	186.895
0.15779E+09	232.309	231.001	231.001	210.920	210.055	189.903
0.18935E+09	233.783	232.498	232.498	212.879	212.032	192.417

0.22090E+09	234.840	233.577	233.577	214.381	213.552	194.419
0.25246E+09	235.762	234.521	234.521	215.728	214.915	196.236
0.28402E+09	235.972	234.752	234.752	216.308	215.510	197.213
0.31558E+09	236.084	234.884	234.884	216.764	215.980	198.036
0.63115E+09	236.041	235.013	235.013	219.582	218.916	203.828
0.94673E+09	235.590	234.689	234.689	221.203	220.621	207.554
0.12623E+10	232.729	231.923	231.923	219.789	219.268	207.558
0.15779E+10	229.500	228.767	228.767	217.629	217.154	206.426
0.18935E+10	226.357	225.680	225.680	215.310	214.870	204.892
0.22090E+10	223.345	222.712	222.712	212.935	212.521	203.115
0.25246E+10	220.093	219.496	219.496	210.192	209.800	200.842
0.28402E+10	217.323	216.756	216.756	207.844	207.471	198.887
0.31558E+10	214.855	214.313	214.313	205.736	205.378	197.110
0.63115E+10	200.055	199.663	199.663	193.170	192.905	186.628
0.94673E+10	190.326	190.015	190.015	184.723	184.511	179.378
0.12623E+11	184.425	184.166	184.166	179.687	179.509	175.159
0.15779E+11	180.438	180.214	180.214	176.294	176.138	172.328
0.18935E+11	176.862	176.663	176.663	173.134	172.995	169.562
0.22090E+11	173.458	173.276	173.276	170.021	169.894	166.724
0.25246E+11	170.063	169.896	169.896	166.869	166.751	163.798
0.28402E+11	166.972	166.816	166.816	163.969	163.858	161.074
0.31558E+11	164.217	164.071	164.071	161.376	161.272	158.634

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:26 JUN 26, 1996 CP= 36981.510
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	4873 TEMP m04o090	5432 TEMP i04i090	5431 TEMP i04o090	6019 TEMP o04o090
0.10000E-05	108.487	28.8688	27.7252	26.1379
0.20000E-05	132.433	71.8843	70.7420	69.1920
31.558	132.433	71.8845	70.7420	69.1920
0.31558E+07	151.206	100.962	99.8312	98.2533
0.63116E+07	155.964	107.732	106.606	105.025
0.94673E+07	159.012	112.108	110.988	109.408
0.12623E+08	161.316	115.461	114.347	112.771
0.15779E+08	163.221	118.192	117.083	115.509
0.18935E+08	164.824	120.517	119.413	117.843
0.22090E+08	166.234	122.538	121.438	119.870
0.25246E+08	167.465	124.279	123.184	121.619
0.28402E+08	168.565	125.858	124.768	123.206
0.31558E+08	169.557	127.321	126.235	124.676
0.63115E+08	176.724	137.735	136.685	135.157
0.94673E+08	181.378	144.567	143.546	142.047
0.12623E+09	185.005	149.950	148.956	147.484
0.15779E+09	188.060	154.509	153.538	152.093
0.18935E+09	190.618	158.350	157.402	155.982
0.22090E+09	192.660	161.497	160.569	159.173
0.25246E+09	194.515	164.363	163.455	162.082
0.28402E+09	195.526	166.167	165.277	163.928
0.31558E+09	196.380	167.736	166.863	165.536
0.63115E+09	202.430	179.241	178.504	177.368
0.94673E+09	206.339	186.756	186.115	185.120
0.12623E+10	206.471	189.107	188.535	187.646
0.15779E+10	205.434	189.603	189.083	188.275
0.18935E+10	203.973	189.280	188.800	188.055
0.22090E+10	202.251	188.402	187.953	187.256
0.25246E+10	200.023	186.806	186.382	185.727
0.28402E+10	198.105	185.417	185.014	184.391
0.31558E+10	196.360	184.117	183.731	183.137
0.63115E+10	186.069	176.676	176.394	175.965
0.94673E+10	178.927	171.173	170.948	170.609
0.12623E+11	174.780	168.175	167.988	167.705

0.15779E+11	171.998	166.193	166.030	165.786
0.18935E+11	169.266	164.010	163.865	163.648
0.22090E+11	166.452	161.570	161.437	161.239
0.25246E+11	163.546	158.968	158.846	158.664
0.28402E+11	160.838	156.494	156.379	156.210
0.31558E+11	158.411	154.270	154.162	154.003

 * Temperature Profile from center to upper right (135 deg.) *

VARIABLE	IS AT NODE	ITEM= TEMP COMP=	NAME=
2	6	ITEM= TEMP COMP=	c01i135
3	37	ITEM= TEMP COMP=	h01o135
4	10	ITEM= TEMP COMP=	s01o135
5	265	ITEM= TEMP COMP=	a01o135
6	461	ITEM= TEMP COMP=	t01o135
7	1270	ITEM= TEMP COMP=	t04i135
8	1278	ITEM= TEMP COMP=	a04i135
9	1188	ITEM= TEMP COMP=	s04i135
10	1228	ITEM= TEMP COMP=	h04i135
11	1244	ITEM= TEMP COMP=	c04i135
12	1260	ITEM= TEMP COMP=	h04o135
13	1197	ITEM= TEMP COMP=	s04o135
14	1305	ITEM= TEMP COMP=	a04o135
15	1323	ITEM= TEMP COMP=	t04o135
16	2733	ITEM= TEMP COMP=	t11i135
17	2741	ITEM= TEMP COMP=	a11i135
18	2651	ITEM= TEMP COMP=	s11i135
19	2691	ITEM= TEMP COMP=	h11i135
20	2707	ITEM= TEMP COMP=	c11i135
21	2723	ITEM= TEMP COMP=	h11o135
22	2660	ITEM= TEMP COMP=	s11o135
23	2768	ITEM= TEMP COMP=	a11o135
24	2786	ITEM= TEMP COMP=	t11o135
25	4344	ITEM= TEMP COMP=	g11i135
26	5109	ITEM= TEMP COMP=	m11i135
27	4910	ITEM= TEMP COMP=	m11o135
28	5767	ITEM= TEMP COMP=	i11i135
29	5839	ITEM= TEMP COMP=	i11o135
30	6280	ITEM= TEMP COMP=	o11o135

Add centers of assemblies 5, 10, 12, 13, 20, 21

VARIABLE 31 IS AT NODE 102 ITEM= TEMP COMP= NAME= c06i135
 VARIABLE 32 IS AT NODE 102 ITEM= TEMP COMP= NAME= c14i135
 VARIABLE 33 IS AT NODE 2289 ITEM= TEMP COMP= NAME= c15i135
 VARIABLE 34 IS AT NODE 2498 ITEM= TEMP COMP= NAME= c17i135
 VARIABLE 35 IS AT NODE 228 ITEM= TEMP COMP= NAME= c22i135
 VARIABLE 36 IS AT NODE 3543 ITEM= TEMP COMP= NAME= c23i135

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	6 TEMP	c01i135	166.8	0.3156E+11	254.3	0.2525E+09
3 NSOL	37 TEMP	h01o135	166.2	0.3156E+11	250.3	0.2525E+09
4 NSOL	10 TEMP	s01o135	165.2	0.3156E+11	244.2	0.2840E+09
5 NSOL	265 TEMP	a01o135	165.2	0.3156E+11	244.1	0.2840E+09
6 NSOL	461 TEMP	t01o135	165.2	0.3156E+11	244.1	0.2840E+09
7 NSOL	1270 TEMP	t04i135	165.1	0.3156E+11	243.7	0.2840E+09
8 NSOL	1278 TEMP	a04i135	165.1	0.3156E+11	243.7	0.2840E+09
9 NSOL	1188 TEMP	s04i135	165.1	0.3156E+11	243.6	0.2840E+09
10 NSOL	1228 TEMP	h04i135	165.9	0.3156E+11	248.3	0.2525E+09
11 NSOL	1244 TEMP	c04i135	166.3	0.3156E+11	250.4	0.2525E+09
12 NSOL	1260 TEMP	h04o135	165.5	0.3156E+11	245.3	0.2840E+09
13 NSOL	1197 TEMP	s04o135	164.5	0.3156E+11	238.2	0.3156E+09
14 NSOL	1305 TEMP	a04o135	164.5	0.3156E+11	238.1	0.3156E+09
15 NSOL	1323 TEMP	t04o135	164.4	0.3156E+11	238.0	0.3156E+09
16 NSOL	2733 TEMP	t11i135	164.3	0.3156E+11	237.3	0.3156E+09
17 NSOL	2741 TEMP	a11i135	164.3	0.3156E+11	237.2	0.3156E+09
18 NSOL	2651 TEMP	s11i135	164.3	0.3156E+11	237.1	0.3156E+09
19 NSOL	2691 TEMP	h11i135	165.0	0.3156E+11	240.7	0.3156E+09
20 NSOL	2707 TEMP	c11i135	165.2	0.3156E+11	241.5	0.3156E+09
21 NSOL	2723 TEMP	h11o135	164.2	0.3156E+11	235.1	0.6312E+09
22 NSOL	2660 TEMP	s11o135	159.7	0.1000E-05	228.8	0.9467E+09
23 NSOL	2768 TEMP	a11o135	159.6	0.1000E-05	228.8	0.9467E+09
24 NSOL	2786 TEMP	t11o135	159.5	0.1000E-05	228.7	0.9467E+09
25 NSOL	4344 TEMP	g11i135	130.6	0.1000E-05	215.5	0.9467E+09
26 NSOL	5109 TEMP	m11i135	114.2	0.1000E-05	208.5	0.9467E+09
27 NSOL	4910 TEMP	m11o135	112.7	0.1000E-05	207.6	0.1262E+10
28 NSOL	5767 TEMP	i11i135	29.13	0.1000E-05	189.5	0.1578E+10
29 NSOL	5839 TEMP	i11o135	27.88	0.1000E-05	188.9	0.1578E+10
30 NSOL	6280 TEMP	o11o135	26.14	0.1000E-05	188.1	0.1578E+10
31 NSOL	102 TEMP	c06i135	166.6	0.3156E+11	253.2	0.2525E+09
32 NSOL	102 TEMP	c14i135	166.6	0.3156E+11	253.2	0.2525E+09
33 NSOL	2289 TEMP	c15i135	166.3	0.3156E+11	250.2	0.2525E+09
34 NSOL	2498 TEMP	c17i135	165.9	0.3156E+11	247.1	0.2840E+09
35 NSOL	228 TEMP	c22i135	165.5	0.3156E+11	244.0	0.2840E+09
36 NSOL	3543 TEMP	c23i135	164.8	0.3156E+11	239.4	0.3156E+09

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.220
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	6 TEMP c01i135	37 TEMP h01o135	10 TEMP s01o135	265 TEMP a01o135	461 TEMP t01o135	1270 TEMP t04i135
0.10000E-05	194.572	189.184	180.412	180.346	180.289	179.884
0.20000E-05	213.020	207.939	199.682	199.616	199.559	199.162
31.558	213.020	207.939	199.682	199.616	199.559	199.162

0.31558E+07	227.514	222.656	214.794	214.728	214.670	214.275
0.63116E+07	231.334	226.540	218.782	218.716	218.658	218.264
0.94673E+07	233.645	228.898	221.216	221.150	221.092	220.700
0.12623E+08	235.401	230.684	223.053	222.987	222.929	222.538
0.15779E+08	236.783	232.098	224.522	224.456	224.398	224.008
0.18935E+08	237.966	233.304	225.766	225.700	225.643	225.254
0.22090E+08	238.960	234.323	226.828	226.762	226.705	226.318
0.25246E+08	239.879	235.258	227.790	227.724	227.667	227.280
0.28402E+08	240.642	236.041	228.605	228.540	228.483	228.097
0.31558E+08	241.290	236.710	229.312	229.247	229.190	228.805
0.63115E+08	245.899	241.467	234.315	234.251	234.195	233.819
0.94673E+08	248.548	244.231	237.270	237.208	237.153	236.785
0.12623E+09	250.416	246.200	239.409	239.347	239.293	238.932
0.15779E+09	251.861	247.735	241.099	241.038	240.985	240.632
0.18935E+09	252.963	248.915	242.420	242.361	242.308	241.961
0.22090E+09	253.668	249.692	243.327	243.268	243.217	242.876
0.25246E+09	254.253	250.345	244.103	244.046	243.996	243.660
0.28402E+09	254.145	250.305	244.171	244.114	244.065	243.736
0.31558E+09	253.957	250.181	244.147	244.092	244.043	243.720
0.63115E+09	251.376	248.138	242.947	242.900	242.858	242.581
0.94673E+09	249.067	246.214	241.644	241.602	241.566	241.322
0.12623E+10	244.859	242.277	238.144	238.107	238.074	237.856
0.15779E+10	240.619	238.239	234.432	234.398	234.368	234.169
0.18935E+10	236.690	234.467	230.911	230.879	230.852	230.668
0.22090E+10	233.067	230.965	227.604	227.575	227.549	227.376
0.25246E+10	229.320	227.315	224.111	224.083	224.059	223.896
0.28402E+10	226.138	224.214	221.139	221.113	221.090	220.935
0.31558E+10	223.320	221.465	218.503	218.478	218.456	218.307
0.63115E+10	206.378	204.962	202.701	202.683	202.667	202.558
0.94673E+10	195.436	194.274	192.423	192.409	192.396	192.308
0.12623E+11	188.727	187.741	186.169	186.157	186.146	186.073
0.15779E+11	184.191	183.326	181.947	181.936	181.927	181.863
0.18935E+11	180.231	179.450	178.206	178.197	178.189	178.132
0.22090E+11	176.554	175.833	174.684	174.676	174.668	174.616
0.25246E+11	172.932	172.261	171.192	171.184	171.177	171.129
0.28402E+11	169.665	169.032	168.025	168.018	168.012	167.967
0.31558E+11	166.757	166.158	165.204	165.198	165.192	165.149

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.230
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1278 TEMP a04i135	1188 TEMP s04i135	1228 TEMP h04i135	1244 TEMP c04i135	1260 TEMP h04o135	1197 TEMP s04o135
0.10000E-05	179.826	179.775	186.821	190.175	183.381	173.309
0.20000E-05	199.104	199.053	205.587	208.636	202.155	192.617
31.558	199.104	199.053	205.587	208.636	202.155	192.617
0.31558E+07	214.216	214.164	220.285	223.087	216.846	207.723
0.63116E+07	218.206	218.154	224.167	226.903	220.725	211.709
0.94673E+07	220.642	220.590	226.530	229.224	223.094	214.158
0.12623E+08	222.479	222.428	228.321	230.987	224.891	216.009
0.15779E+08	223.950	223.898	229.741	232.380	226.320	217.494
0.18935E+08	225.196	225.144	230.951	233.570	227.537	218.752
0.22090E+08	226.260	226.208	231.975	234.573	228.568	219.830
0.25246E+08	227.222	227.171	232.914	235.498	229.513	220.804
0.28402E+08	228.039	227.988	233.702	236.270	230.307	221.634
0.31558E+08	228.747	228.696	234.375	236.925	230.987	222.355
0.63115E+08	233.762	233.712	239.175	241.612	235.850	227.493
0.94673E+08	236.729	236.680	241.982	244.338	238.717	230.580
0.12623E+09	238.878	238.829	243.991	246.279	240.785	232.841
0.15779E+09	240.578	240.530	245.566	247.792	242.416	234.652
0.18935E+09	241.908	241.861	246.783	248.955	243.688	236.088

0.22090E+09	242.824	242.778	247.597	249.721	244.554	237.106
0.25246E+09	243.610	243.564	248.285	250.364	245.295	237.990
0.28402E+09	243.686	243.641	248.280	250.322	245.340	238.163
0.31558E+09	243.670	243.627	248.189	250.198	245.297	238.240
0.63115E+09	242.539	242.501	246.427	248.159	243.944	237.888
0.94673E+09	241.286	241.253	244.711	246.242	242.531	237.209
0.12623E+10	237.823	237.794	240.931	242.326	238.977	234.176
0.15779E+10	234.139	234.113	237.012	238.309	235.231	230.817
0.18935E+10	230.640	230.615	233.333	234.554	231.686	227.572
0.22090E+10	227.350	227.327	229.903	231.067	228.362	224.480
0.25246E+10	223.871	223.849	226.313	227.431	224.857	221.163
0.28402E+10	220.911	220.891	223.260	224.340	221.876	218.338
0.31558E+10	218.285	218.266	220.553	221.601	219.230	215.825
0.63115E+10	202.542	202.527	204.298	205.125	203.333	200.754
0.94673E+10	192.295	192.284	193.745	194.437	192.978	190.876
0.12623E+11	186.062	186.053	187.299	187.893	186.659	184.879
0.15779E+11	181.854	181.846	182.943	183.468	182.388	180.829
0.18935E+11	178.124	178.116	179.108	179.586	178.613	177.210
0.22090E+11	174.609	174.602	175.521	175.964	175.069	173.774
0.25246E+11	171.122	171.116	171.973	172.389	171.557	170.354
0.28402E+11	167.960	167.955	168.764	169.158	168.375	167.244
0.31558E+11	165.143	165.138	165.906	166.280	165.542	164.471

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.240
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	1305 TEMP a04o135	1323 TEMP t04o135	2733 TEMP t11i135	2741 TEMP a11i135	2651 TEMP s11i135	2691 TEMP h11i135
0.10000E-05	173.170	173.041	172.127	171.998	171.875	177.944
0.20000E-05	192.478	192.350	191.451	191.322	191.198	196.730
31.558	192.478	192.350	191.451	191.322	191.198	196.730
0.31558E+07	207.584	207.455	206.568	206.439	206.315	211.431
0.63116E+07	211.571	211.441	210.557	210.427	210.303	215.305
0.94673E+07	214.020	213.891	213.010	212.880	212.756	217.685
0.12623E+08	215.870	215.741	214.864	214.734	214.610	219.490
0.15779E+08	217.356	217.227	216.352	216.223	216.099	220.931
0.18935E+08	218.615	218.486	217.614	217.485	217.361	222.157
0.22090E+08	219.693	219.564	218.695	218.566	218.442	223.201
0.25246E+08	220.666	220.538	219.671	219.542	219.419	224.154
0.28402E+08	221.497	221.369	220.504	220.375	220.252	224.960
0.31558E+08	222.218	222.090	221.227	221.099	220.976	225.651
0.63115E+08	227.359	227.234	226.391	226.265	226.144	230.616
0.94673E+08	230.448	230.325	229.500	229.376	229.257	233.580
0.12623E+09	232.712	232.591	231.783	231.661	231.545	235.740
0.15779E+09	234.525	234.407	233.614	233.494	233.380	237.461
0.18935E+09	235.963	235.846	235.068	234.951	234.839	238.818
0.22090E+09	236.983	236.868	236.104	235.989	235.879	239.767
0.25246E+09	237.870	237.757	237.007	236.894	236.785	240.589
0.28402E+09	238.045	237.934	237.197	237.086	236.979	240.714
0.31558E+09	238.123	238.014	237.289	237.180	237.075	240.746
0.63115E+09	237.788	237.695	237.073	236.980	236.890	240.036
0.94673E+09	237.122	237.040	236.495	236.413	236.335	239.099
0.12623E+10	234.098	234.025	233.537	233.464	233.394	235.902
0.15779E+10	230.746	230.680	230.234	230.168	230.103	232.426
0.18935E+10	227.506	227.445	227.032	226.971	226.911	229.093
0.22090E+10	224.418	224.361	223.974	223.917	223.861	225.933
0.25246E+10	221.105	221.051	220.685	220.631	220.579	222.564
0.28402E+10	218.283	218.231	217.883	217.831	217.782	219.695
0.31558E+10	215.772	215.723	215.389	215.340	215.293	217.144
0.63115E+10	200.715	200.680	200.435	200.399	200.365	201.813
0.94673E+10	190.846	190.817	190.621	190.593	190.566	191.768

0.12623E+11	184.854	184.831	184.666	184.643	184.620	185.650
0.15779E+11	180.807	180.787	180.645	180.624	180.605	181.513
0.18935E+11	177.191	177.173	177.045	177.027	177.010	177.833
0.22090E+11	173.757	173.740	173.624	173.607	173.592	174.356
0.25246E+11	170.338	170.323	170.215	170.200	170.185	170.901
0.28402E+11	167.229	167.215	167.115	167.100	167.087	167.763
0.31558E+11	164.457	164.444	164.349	164.336	164.323	164.967

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.250
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2707 TEMP c11i135	2723 TEMP h11o135	2660 TEMP s11o135	2768 TEMP a11o135	2786 TEMP t11o135	4344 TEMP g11i135
0.10000E-05	179.809	171.078	159.727	159.601	159.486	130.561
0.20000E-05	198.278	189.887	179.119	178.994	178.882	152.359
31.558	198.278	189.887	179.118	178.994	178.882	152.359
0.31558E+07	212.735	204.615	194.300	194.178	194.067	169.294
0.63116E+07	216.539	208.487	198.294	198.171	198.061	173.708
0.94673E+07	218.877	210.879	200.774	200.652	200.542	176.504
0.12623E+08	220.656	212.697	202.655	202.534	202.424	178.620
0.15779E+08	222.072	214.151	204.172	204.051	203.942	180.354
0.18935E+08	223.280	215.392	205.462	205.341	205.232	181.817
0.22090E+08	224.305	216.449	206.569	206.449	206.340	183.094
0.25246E+08	225.246	217.414	207.569	207.449	207.340	184.219
0.28402E+08	226.038	218.233	208.428	208.308	208.200	185.212
0.31558E+08	226.714	218.936	209.175	209.056	208.948	186.096
0.63115E+08	231.590	224.031	214.581	214.465	214.360	192.482
0.94673E+08	234.497	227.121	217.921	217.807	217.704	196.558
0.12623E+09	236.610	229.400	220.422	220.311	220.210	199.693
0.15779E+09	238.292	231.235	222.465	222.356	222.257	202.308
0.18935E+09	239.616	232.701	224.121	224.014	223.917	204.475
0.22090E+09	240.539	233.757	225.352	225.246	225.152	206.166
0.25246E+09	241.336	234.681	226.444	226.341	226.248	207.694
0.28402E+09	241.445	234.906	226.817	226.715	226.624	208.434
0.31558E+09	241.463	235.033	227.082	226.982	226.892	209.038
0.63115E+09	240.647	235.131	228.337	228.251	228.174	213.058
0.94673E+09	239.637	234.793	228.840	228.766	228.698	215.540
0.12623E+10	236.404	232.044	226.687	226.620	226.560	214.725
0.15779E+10	232.905	228.907	223.992	223.931	223.876	213.005
0.18935E+10	229.555	225.838	221.266	221.209	221.158	211.024
0.22090E+10	226.384	222.884	218.576	218.524	218.476	208.907
0.25246E+10	223.007	219.685	215.591	215.541	215.496	206.372
0.28402E+10	220.131	216.957	213.041	212.993	212.951	204.195
0.31558E+10	217.574	214.525	210.758	210.712	210.671	202.232
0.63115E+10	202.187	199.902	197.065	197.032	197.001	190.554
0.94673E+10	192.097	190.248	187.942	187.916	187.892	182.602
0.12623E+11	185.940	184.382	182.435	182.412	182.392	177.898
0.15779E+11	181.775	180.414	178.711	178.692	178.675	174.730
0.18935E+11	178.075	176.853	175.321	175.304	175.288	171.729
0.22090E+11	174.584	173.460	172.050	172.034	172.020	168.730
0.25246E+11	171.117	170.075	168.766	168.751	168.738	165.670
0.28402E+11	167.972	166.993	165.761	165.748	165.736	162.842
0.31558E+11	165.167	164.244	163.080	163.068	163.056	160.312

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.260
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	5109 TEMP m11i135	4910 TEMP m11o135	5767 TEMP i11i135	5839 TEMP i11o135	6280 TEMP o11o135	102 TEMP c06i135
0.10000E-05	114.176	112.695	29.1250	27.8754	26.1379	193.409
0.20000E-05	137.488	136.066	72.1178	70.8672	69.1654	211.859
31.558	137.488	136.066	72.1180	70.8672	69.1654	211.859
0.31558E+07	155.516	154.141	100.613	99.3859	97.6979	226.357
0.63116E+07	160.172	158.804	107.384	106.163	104.471	230.176
0.94673E+07	163.150	161.788	111.768	110.552	108.862	232.489
0.12623E+08	165.402	164.047	115.127	113.918	112.231	234.247
0.15779E+08	167.261	165.912	117.865	116.660	114.975	235.632
0.18935E+08	168.826	167.482	120.195	118.996	117.314	236.816
0.22090E+08	170.202	168.863	122.222	121.027	119.349	237.812
0.25246E+08	171.404	170.068	123.964	122.775	121.099	238.733
0.28402E+08	172.474	171.143	125.544	124.359	122.686	239.499
0.31558E+08	173.438	172.111	127.008	125.828	124.158	240.148
0.63115E+08	180.403	179.113	137.441	136.299	134.660	244.778
0.94673E+08	184.911	183.654	144.288	143.178	141.568	247.447
0.12623E+09	188.416	187.188	149.686	148.604	147.023	249.333
0.15779E+09	191.362	190.162	154.255	153.200	151.646	250.793
0.18935E+09	193.825	192.650	158.109	157.077	155.550	251.910
0.22090E+09	195.781	194.630	161.261	160.252	158.750	252.631
0.25246E+09	197.557	196.430	164.137	163.149	161.673	253.230
0.28402E+09	198.505	197.399	165.952	164.983	163.532	253.140
0.31558E+09	199.301	198.214	167.529	166.578	165.151	252.969
0.63115E+09	204.873	203.950	179.077	178.274	177.049	250.532
0.94673E+09	208.452	207.647	186.625	185.926	184.852	248.327
0.12623E+10	208.370	207.650	189.001	188.378	187.416	244.196
0.15779E+10	207.179	206.522	189.515	188.948	188.073	240.015
0.18935E+10	205.601	204.994	189.206	188.682	187.874	236.131
0.22090E+10	203.791	203.221	188.336	187.846	187.091	232.544
0.25246E+10	201.497	200.957	186.751	186.288	185.576	228.826
0.28402E+10	199.521	199.007	185.367	184.927	184.251	225.667
0.31558E+10	197.727	197.234	184.072	183.650	183.005	222.870
0.63115E+10	187.124	186.760	176.655	176.348	175.881	206.050
0.94673E+10	179.792	179.501	171.155	170.910	170.541	195.175
0.12623E+11	175.513	175.269	168.159	167.954	167.647	188.509
0.15779E+11	172.640	172.428	166.177	165.999	165.733	184.003
0.18935E+11	169.846	169.656	163.996	163.837	163.601	180.063
0.22090E+11	166.989	166.815	161.558	161.412	161.197	176.400
0.25246E+11	164.048	163.888	158.958	158.824	158.626	172.791
0.28402E+11	161.312	161.162	156.485	156.359	156.175	169.533
0.31558E+11	158.861	158.720	154.262	154.144	153.971	166.632

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.270
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	102 TEMP c14i135	2289 TEMP c15i135	2498 TEMP c17i135	228 TEMP c22i135	3543 TEMP c23i135
0.10000E-05	193.409	189.951	186.336	182.580	176.752
0.20000E-05	211.859	208.405	204.809	201.079	195.387
31.558	211.859	208.405	204.809	201.078	195.387
0.31558E+07	226.357	222.913	219.285	215.652	210.027
0.63116E+07	230.176	226.730	223.099	219.468	213.864
0.94673E+07	232.489	229.051	225.428	221.808	216.229
0.12623E+08	234.247	230.814	227.198	223.585	218.026
0.15779E+08	235.632	232.207	228.600	224.997	219.460
0.18935E+08	236.816	233.397	229.797	226.203	220.682

0.12623E+11	184.854	184.831	184.666	184.643	184.620	185.650
0.15779E+11	180.807	180.787	180.645	180.624	180.605	181.513
0.18935E+11	177.191	177.173	177.045	177.027	177.010	177.833
0.22090E+11	173.757	173.740	173.624	173.607	173.592	174.356
0.25246E+11	170.338	170.323	170.215	170.200	170.185	170.901
0.28402E+11	167.229	167.215	167.115	167.100	167.087	167.763
0.31558E+11	164.457	164.444	164.349	164.336	164.323	164.967

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.250
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2707 TEMP c11i135	2723 TEMP h11o135	2660 TEMP s11o135	2768 TEMP a11o135	2786 TEMP t11o135	4344 TEMP g11i135
0.10000E-05	179.809	171.078	159.727	159.601	159.486	130.561
0.20000E-05	198.278	189.887	179.119	178.994	178.882	152.359
31.558	198.278	189.887	179.118	178.994	178.882	152.359
0.31558E+07	212.735	204.615	194.300	194.178	194.067	169.294
0.63116E+07	216.539	208.487	198.294	198.171	198.061	173.708
0.94673E+07	218.877	210.879	200.774	200.652	200.542	176.504
0.12623E+08	220.656	212.697	202.655	202.534	202.424	178.620
0.15779E+08	222.072	214.151	204.172	204.051	203.942	180.354
0.18935E+08	223.280	215.392	205.462	205.341	205.232	181.817
0.22090E+08	224.305	216.449	206.569	206.449	206.340	183.094
0.25246E+08	225.246	217.414	207.569	207.449	207.340	184.219
0.28402E+08	226.038	218.233	208.428	208.308	208.200	185.212
0.31558E+08	226.714	218.936	209.175	209.056	208.948	186.096
0.63115E+08	231.590	224.031	214.581	214.465	214.360	192.482
0.94673E+08	234.497	227.121	217.921	217.807	217.704	196.558
0.12623E+09	236.610	229.400	220.422	220.311	220.210	199.693
0.15779E+09	238.292	231.235	222.465	222.356	222.257	202.308
0.18935E+09	239.616	232.701	224.121	224.014	223.917	204.475
0.22090E+09	240.539	233.757	225.352	225.246	225.152	206.166
0.25246E+09	241.336	234.681	226.444	226.341	226.248	207.694
0.28402E+09	241.445	234.906	226.817	226.715	226.624	208.434
0.31558E+09	241.463	235.033	227.082	226.982	226.892	209.038
0.63115E+09	240.647	235.131	228.337	228.251	228.174	213.058
0.94673E+09	239.637	234.793	228.840	228.766	228.698	215.540
0.12623E+10	236.404	232.044	226.687	226.620	226.560	214.725
0.15779E+10	232.905	228.907	223.992	223.931	223.876	213.005
0.18935E+10	229.555	225.838	221.266	221.209	221.158	211.024
0.22090E+10	226.384	222.884	218.576	218.524	218.476	208.907
0.25246E+10	223.007	219.685	215.591	215.541	215.496	206.372
0.28402E+10	220.131	216.957	213.041	212.993	212.951	204.195
0.31558E+10	217.574	214.525	210.758	210.712	210.671	202.232
0.63115E+10	202.187	199.902	197.065	197.032	197.001	190.554
0.94673E+10	192.097	190.248	187.942	187.916	187.892	182.602
0.12623E+11	185.940	184.382	182.435	182.412	182.392	177.898
0.15779E+11	181.775	180.414	178.711	178.692	178.675	174.730
0.18935E+11	178.075	176.853	175.321	175.304	175.288	171.729
0.22090E+11	174.584	173.460	172.050	172.034	172.020	168.730
0.25246E+11	171.117	170.075	168.766	168.751	168.738	165.670
0.28402E+11	167.972	166.993	165.761	165.748	165.736	162.842
0.31558E+11	165.167	164.244	163.080	163.068	163.056	160.312

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.260
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	5109 TEMP m11i135	4910 TEMP m11o135	5767 TEMP i11i135	5839 TEMP i11o135	6280 TEMP o11o135	102 TEMP c06i135
0.10000E-05	114.176	112.695	29.1250	27.8754	26.1379	193.409
0.20000E-05	137.488	136.066	72.1178	70.8672	69.1654	211.859
31.558	137.488	136.066	72.1180	70.8672	69.1654	211.859
0.31558E+07	155.516	154.141	100.613	99.3859	97.6979	226.357
0.63116E+07	160.172	158.804	107.384	106.163	104.471	230.176
0.94673E+07	163.150	161.788	111.768	110.552	108.862	232.489
0.12623E+08	165.402	164.047	115.127	113.918	112.231	234.247
0.15779E+08	167.261	165.912	117.865	116.660	114.975	235.632
0.18935E+08	168.826	167.482	120.195	118.996	117.314	236.816
0.22090E+08	170.202	168.863	122.222	121.027	119.349	237.812
0.25246E+08	171.404	170.068	123.964	122.775	121.099	238.733
0.28402E+08	172.474	171.143	125.544	124.359	122.686	239.499
0.31558E+08	173.438	172.111	127.008	125.828	124.158	240.148
0.63115E+08	180.403	179.113	137.441	136.299	134.660	244.778
0.94673E+08	184.911	183.654	144.288	143.178	141.568	247.447
0.12623E+09	188.416	187.188	149.686	148.604	147.023	249.333
0.15779E+09	191.362	190.162	154.255	153.200	151.646	250.793
0.18935E+09	193.825	192.650	158.109	157.077	155.550	251.910
0.22090E+09	195.781	194.630	161.261	160.252	158.750	252.631
0.25246E+09	197.557	196.430	164.137	163.149	161.673	253.230
0.28402E+09	198.505	197.399	165.952	164.983	163.532	253.140
0.31558E+09	199.301	198.214	167.529	166.578	165.151	252.969
0.63115E+09	204.873	203.950	179.077	178.274	177.049	250.532
0.94673E+09	208.452	207.647	186.625	185.926	184.852	248.327
0.12623E+10	208.370	207.650	189.001	188.378	187.416	244.196
0.15779E+10	207.179	206.522	189.515	188.948	188.073	240.015
0.18935E+10	205.601	204.994	189.206	188.682	187.874	236.131
0.22090E+10	203.791	203.221	188.336	187.846	187.091	232.544
0.25246E+10	201.497	200.957	186.751	186.288	185.576	228.826
0.28402E+10	199.521	199.007	185.367	184.927	184.251	225.667
0.31558E+10	197.727	197.234	184.072	183.650	183.005	222.870
0.63115E+10	187.124	186.760	176.655	176.348	175.881	206.050
0.94673E+10	179.792	179.501	171.155	170.910	170.541	195.175
0.12623E+11	175.513	175.269	168.159	167.954	167.647	188.509
0.15779E+11	172.640	172.428	166.177	165.999	165.733	184.003
0.18935E+11	169.846	169.656	163.996	163.837	163.601	180.063
0.22090E+11	166.989	166.815	161.558	161.412	161.197	176.400
0.25246E+11	164.048	163.888	158.958	158.824	158.626	172.791
0.28402E+11	161.312	161.162	156.485	156.359	156.175	169.533
0.31558E+11	158.861	158.720	154.262	154.144	153.971	166.632

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:31 JUN 26, 1996 CP= 36986.270
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	102 TEMP c14i135	2289 TEMP c15i135	2498 TEMP c17i135	228 TEMP c22i135	3543 TEMP c23i135
0.10000E-05	193.409	189.951	186.336	182.580	176.752
0.20000E-05	211.859	208.405	204.809	201.079	195.387
31.558	211.859	208.405	204.809	201.078	195.387
0.31558E+07	226.357	222.913	219.285	215.652	210.027
0.63116E+07	230.176	226.730	223.099	219.468	213.864
0.94673E+07	232.489	229.051	225.428	221.808	216.229
0.12623E+08	234.247	230.814	227.198	223.585	218.026
0.15779E+08	235.632	232.207	228.600	224.997	219.460
0.18935E+08	236.816	233.397	229.797	226.203	220.682

0.22090E+08	237.812	234.400	230.810	227.224	221.721
0.25246E+08	238.733	235.326	231.741	228.162	222.673
0.28402E+08	239.499	236.098	232.520	228.950	223.477
0.31558E+08	240.148	236.754	233.184	229.621	224.164
0.63115E+08	244.778	241.443	237.941	234.451	229.129
0.94673E+08	247.447	244.171	240.733	237.310	232.105
0.12623E+09	249.333	246.114	242.738	239.377	234.279
0.15779E+09	250.793	247.630	244.313	241.013	236.017
0.18935E+09	251.910	248.795	245.536	242.293	237.391
0.22090E+09	252.631	249.564	246.359	243.172	238.360
0.25246E+09	253.230	250.209	247.059	243.926	239.201
0.28402E+09	253.140	250.170	247.073	243.991	239.347
0.31558E+09	252.969	250.048	247.001	243.968	239.401
0.63115E+09	250.532	248.031	245.411	242.801	238.881
0.94673E+09	248.327	246.129	243.826	241.528	238.086
0.12623E+10	244.196	242.225	240.160	238.095	235.003
0.15779E+10	240.015	238.217	236.332	234.444	231.615
0.18935E+10	236.131	234.469	232.725	230.975	228.351
0.22090E+10	232.544	230.987	229.353	227.711	225.246
0.25246E+10	228.826	227.355	225.812	224.257	221.922
0.28402E+10	225.667	224.268	222.799	221.318	219.091
0.31558E+10	222.870	221.532	220.126	218.707	216.572
0.63115E+10	206.050	205.074	204.047	203.003	201.423
0.94673E+10	195.175	194.398	193.578	192.743	191.473
0.12623E+11	188.509	187.861	187.176	186.478	185.412
0.15779E+11	184.003	183.441	182.846	182.240	181.312
0.18935E+11	180.063	179.562	179.031	178.490	177.659
0.22090E+11	176.400	175.943	175.457	174.962	174.200
0.25246E+11	172.791	172.369	171.922	171.464	170.760
0.28402E+11	169.533	169.139	168.722	168.295	167.635
0.31558E+11	166.632	166.263	165.871	165.469	164.849

 * Temperature Profile from center to top of WP (180 deg.) *

VARIABLE 2	IS AT NODE	924	ITEM= TEMP COMP=	NAME= t02i000
VARIABLE 3	IS AT NODE	253	ITEM= TEMP COMP=	NAME= a02i000
VARIABLE 4	IS AT NODE	1	ITEM= TEMP COMP=	NAME= s02i000
VARIABLE 5	IS AT NODE	4	ITEM= TEMP COMP=	NAME= h02i000
VARIABLE 6	IS AT NODE	6	ITEM= TEMP COMP=	NAME= c02i000
VARIABLE 7	IS AT NODE	8	ITEM= TEMP COMP=	NAME= h02o000
VARIABLE 8	IS AT NODE	2	ITEM= TEMP COMP=	NAME= s02o000
VARIABLE 9	IS AT NODE	263	ITEM= TEMP COMP=	NAME= a02o000
VARIABLE 10	IS AT NODE	459	ITEM= TEMP COMP=	NAME= t08i000
VARIABLE 11	IS AT NODE	669	ITEM= TEMP COMP=	NAME= a08i000
VARIABLE 12	IS AT NODE	623	ITEM= TEMP COMP=	NAME= s08i000
VARIABLE 13	IS AT NODE	626	ITEM= TEMP COMP=	NAME= h08i000
VARIABLE 14	IS AT NODE	628	ITEM= TEMP COMP=	NAME= c08i000
VARIABLE 15	IS AT NODE	630	ITEM= TEMP COMP=	NAME= h08o000
VARIABLE 16	IS AT NODE	624	ITEM= TEMP COMP=	NAME= s08o000
VARIABLE 17	IS AT NODE	688	ITEM= TEMP COMP=	NAME= a08o000
VARIABLE 18	IS AT NODE	698	ITEM= TEMP COMP=	NAME= t18i000

VARIABLE 19	IS AT NODE	782	ITEM= TEMP COMP=	NAME= a18i000
VARIABLE 20	IS AT NODE	736	ITEM= TEMP COMP=	NAME= s18i000
VARIABLE 21	IS AT NODE	739	ITEM= TEMP COMP=	NAME= h18i000
VARIABLE 22	IS AT NODE	741	ITEM= TEMP COMP=	NAME= c18i000
VARIABLE 23	IS AT NODE	743	ITEM= TEMP COMP=	NAME= h18o000
VARIABLE 24	IS AT NODE	737	ITEM= TEMP COMP=	NAME= s18o000
VARIABLE 25	IS AT NODE	801	ITEM= TEMP COMP=	NAME= a18o000
VARIABLE 26	IS AT NODE	811	ITEM= TEMP COMP=	NAME= t24i000
VARIABLE 27	IS AT NODE	351	ITEM= TEMP COMP=	NAME= a24i000
VARIABLE 28	IS AT NODE	127	ITEM= TEMP COMP=	NAME= s24i000
VARIABLE 29	IS AT NODE	130	ITEM= TEMP COMP=	NAME= h24i000
VARIABLE 30	IS AT NODE	132	ITEM= TEMP COMP=	NAME= c24i000
VARIABLE 31	IS AT NODE	134	ITEM= TEMP COMP=	NAME= h24o000
VARIABLE 32	IS AT NODE	128	ITEM= TEMP COMP=	NAME= s24o000
VARIABLE 33	IS AT NODE	361	ITEM= TEMP COMP=	NAME= t24o000
VARIABLE 34	IS AT NODE	4271	ITEM= TEMP COMP=	NAME= g24i000
VARIABLE 35	IS AT NODE	4269	ITEM= TEMP COMP=	NAME= g24o000
VARIABLE 36	IS AT NODE	5135	ITEM= TEMP COMP=	NAME= m24i000
VARIABLE 37	IS AT NODE	4872	ITEM= TEMP COMP=	NAME= m24o000
VARIABLE 38	IS AT NODE	5728	ITEM= TEMP COMP=	NAME= i24i000
VARIABLE 39	IS AT NODE	5727	ITEM= TEMP COMP=	NAME= i24o000
VARIABLE 40	IS AT NODE	6241	ITEM= TEMP COMP=	NAME= o24o000

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	924 TEMP	t02i000	165.4	0.3156E+11	245.8	0.2840E+09
3 NSOL	253 TEMP	a02i000	165.4	0.3156E+11	245.8	0.2840E+09
4 NSOL	1 TEMP	s02i000	165.4	0.3156E+11	245.8	0.2840E+09
5 NSOL	4 TEMP	h02i000	166.5	0.3156E+11	252.6	0.2525E+09
6 NSOL	6 TEMP	c02i000	166.8	0.3156E+11	254.3	0.2525E+09
7 NSOL	8 TEMP	h02o000	166.4	0.3156E+11	251.8	0.2525E+09
8 NSOL	2 TEMP	s02o000	165.2	0.3156E+11	244.4	0.2840E+09
9 NSOL	263 TEMP	a02o000	165.2	0.3156E+11	244.3	0.2840E+09
10 NSOL	459 TEMP	t08i000	165.2	0.3156E+11	244.3	0.2840E+09
11 NSOL	669 TEMP	a08i000	165.2	0.3156E+11	244.3	0.2840E+09
12 NSOL	623 TEMP	s08i000	165.2	0.3156E+11	244.3	0.2840E+09
13 NSOL	626 TEMP	h08i000	166.2	0.3156E+11	250.4	0.2525E+09
14 NSOL	628 TEMP	c08i000	166.4	0.3156E+11	251.4	0.2525E+09
15 NSOL	630 TEMP	h08o000	166.0	0.3156E+11	248.3	0.2525E+09
16 NSOL	624 TEMP	s08o000	164.7	0.3156E+11	240.1	0.3156E+09
17 NSOL	688 TEMP	a08o000	164.7	0.3156E+11	240.1	0.3156E+09
18 NSOL	698 TEMP	t18i000	164.7	0.3156E+11	240.1	0.3156E+09
19 NSOL	782 TEMP	a18i000	164.7	0.3156E+11	240.1	0.3156E+09
20 NSOL	736 TEMP	s18i000	164.7	0.3156E+11	240.1	0.3156E+09
21 NSOL	739 TEMP	h18i000	165.6	0.3156E+11	245.4	0.2840E+09
22 NSOL	741 TEMP	c18i000	165.7	0.3156E+11	245.7	0.2840E+09

23	NSOL	743	TEMP	h18o000	165.1	0.3156E+11	241.9	0.3156E+09
24	NSOL	737	TEMP	s18o000	163.8	0.3156E+11	233.2	0.6312E+09
25	NSOL	801	TEMP	a18o000	163.8	0.3156E+11	233.1	0.6312E+09
26	NSOL	811	TEMP	t24i000	163.8	0.3156E+11	233.1	0.6312E+09
27	NSOL	351	TEMP	a24i000	163.8	0.3156E+11	233.1	0.6312E+09
28	NSOL	127	TEMP	s24i000	163.8	0.3156E+11	233.2	0.6312E+09
29	NSOL	130	TEMP	h24i000	164.4	0.3156E+11	236.4	0.3156E+09
30	NSOL	132	TEMP	c24i000	164.2	0.3156E+11	234.9	0.6312E+09
31	NSOL	134	TEMP	h24o000	161.5	0.1000E-05	229.7	0.9467E+09
32	NSOL	128	TEMP	s24o000	140.5	0.1000E-05	219.2	0.9467E+09
33	NSOL	361	TEMP	t24o000	140.3	0.1000E-05	219.1	0.9467E+09
34	NSOL	4271	TEMP	g24i000	129.0	0.1000E-05	214.1	0.9467E+09
35	NSOL	4269	TEMP	g24o000	128.9	0.1000E-05	214.0	0.9467E+09
36	NSOL	5135	TEMP	m24i000	120.1	0.1000E-05	209.8	0.9467E+09
37	NSOL	4872	TEMP	m24o000	119.1	0.1000E-05	209.3	0.9467E+09
38	NSOL	5728	TEMP	i24i000	28.97	0.1000E-05	189.3	0.1578E+10
39	NSOL	5727	TEMP	i24o000	27.89	0.1000E-05	188.8	0.1578E+10
40	NSOL	6241	TEMP	o24o000	26.14	0.1000E-05	187.9	0.1578E+10

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.510
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	924 TEMP t02i000	253 TEMP a02i000	1 TEMP s02i000	4 TEMP h02i000	6 TEMP c02i000	8 TEMP h02o000
0.10000E-05	182.255	182.257	182.334	192.108	194.572	191.306
0.20000E-05	201.514	201.516	201.591	210.729	213.020	209.930
31.558	201.514	201.516	201.591	210.729	213.020	209.930
0.31558E+07	216.677	216.679	216.752	225.373	227.514	224.546
0.63116E+07	220.668	220.670	220.742	229.231	231.334	228.403
0.94673E+07	223.099	223.101	223.172	231.568	233.645	230.741
0.12623E+08	224.932	224.934	225.005	233.340	235.401	232.514
0.15779E+08	226.397	226.399	226.470	234.739	236.783	233.915
0.18935E+08	227.638	227.640	227.710	235.934	237.966	235.111
0.22090E+08	228.695	228.697	228.768	236.941	238.960	236.120
0.25246E+08	229.654	229.656	229.727	237.868	239.879	237.048
0.28402E+08	230.466	230.468	230.539	238.642	240.642	237.823
0.31558E+08	231.170	231.172	231.242	239.301	241.290	238.483
0.63115E+08	236.137	236.139	236.208	243.983	245.899	243.180
0.94673E+08	239.058	239.060	239.127	246.687	248.548	245.898
0.12623E+09	241.164	241.166	241.231	248.602	250.416	247.827
0.15779E+09	242.822	242.824	242.888	250.086	251.861	249.325
0.18935E+09	244.113	244.115	244.178	251.220	252.963	250.471
0.22090E+09	244.990	244.992	245.054	251.957	253.668	251.218
0.25246E+09	245.738	245.740	245.801	252.573	254.253	251.844
0.28402E+09	245.777	245.779	245.839	252.494	254.145	251.777
0.31558E+09	245.727	245.729	245.788	252.334	253.957	251.629
0.63115E+09	244.301	244.303	244.353	249.985	251.376	249.384
0.94673E+09	242.830	242.832	242.876	247.841	249.067	247.313
0.12623E+10	239.205	239.206	239.246	243.745	244.859	243.272
0.15779E+10	235.398	235.399	235.435	239.588	240.619	239.157
0.18935E+10	231.802	231.803	231.837	235.723	236.690	235.325
0.22090E+10	228.438	228.438	228.470	232.150	233.067	231.778
0.25246E+10	224.896	224.897	224.927	228.442	229.320	228.091
0.28402E+10	221.886	221.887	221.915	225.293	226.138	224.959
0.31558E+10	219.217	219.218	219.245	222.503	223.320	222.184
0.63115E+10	203.218	203.219	203.239	205.745	206.378	205.513
0.94673E+10	192.834	192.835	192.851	194.912	195.436	194.727
0.12623E+11	186.512	186.512	186.526	188.280	188.727	188.126
0.15779E+11	182.244	182.244	182.256	183.798	184.191	183.664
0.18935E+11	178.471	178.472	178.482	179.875	180.231	179.755
0.22090E+11	174.926	174.926	174.936	176.225	176.554	176.115

0.25246E+11	171.414	171.415	171.424	172.625	172.932	172.524
0.28402E+11	168.233	168.233	168.242	169.374	169.665	169.280
0.31558E+11	165.399	165.399	165.407	166.481	166.757	166.393

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.520
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	2 TEMP s02o000	263 TEMP a02o000	459 TEMP t08i000	669 TEMP a08i000	623 TEMP s08i000	626 TEMP h08i000
0.10000E-05	180.637	180.556	180.553	180.550	180.621	189.638
0.20000E-05	199.907	199.827	199.824	199.821	199.891	208.271
31.558	199.907	199.827	199.824	199.821	199.891	208.271
0.31558E+07	215.013	214.934	214.932	214.928	214.996	222.863
0.63116E+07	219.001	218.923	218.920	218.916	218.984	226.719
0.94673E+07	221.434	221.357	221.354	221.350	221.417	229.061
0.12623E+08	223.270	223.193	223.190	223.186	223.253	230.837
0.15779E+08	224.739	224.662	224.659	224.655	224.721	232.243
0.18935E+08	225.983	225.906	225.903	225.899	225.965	233.442
0.22090E+08	227.044	226.968	226.965	226.961	227.027	234.454
0.25246E+08	228.005	227.929	227.926	227.923	227.988	235.385
0.28402E+08	228.821	228.745	228.742	228.738	228.803	236.163
0.31558E+08	229.527	229.451	229.448	229.445	229.510	236.826
0.63115E+08	234.525	234.451	234.449	234.445	234.508	241.553
0.94673E+08	237.477	237.404	237.402	237.398	237.460	244.301
0.12623E+09	239.611	239.540	239.538	239.534	239.595	246.258
0.15779E+09	241.298	241.228	241.226	241.222	241.282	247.784
0.18935E+09	242.615	242.547	242.544	242.541	242.599	248.956
0.22090E+09	243.519	243.451	243.449	243.446	243.503	249.729
0.25246E+09	244.292	244.226	244.223	244.220	244.276	250.377
0.28402E+09	244.356	244.291	244.289	244.286	244.341	250.336
0.31558E+09	244.330	244.266	244.264	244.260	244.315	250.211
0.63115E+09	243.103	243.049	243.047	243.044	243.091	248.167
0.94673E+09	241.781	241.733	241.731	241.729	241.770	246.244
0.12623E+10	238.267	238.224	238.222	238.220	238.257	242.314
0.15779E+10	234.543	234.504	234.503	234.501	234.534	238.284
0.18935E+10	231.014	230.977	230.976	230.974	231.005	234.518
0.22090E+10	227.700	227.666	227.665	227.663	227.693	231.021
0.25246E+10	224.202	224.170	224.168	224.167	224.195	227.377
0.28402E+10	221.226	221.195	221.194	221.193	221.219	224.279
0.31558E+10	218.586	218.557	218.556	218.554	218.580	221.534
0.63115E+10	202.762	202.740	202.739	202.738	202.757	205.039
0.94673E+10	192.471	192.453	192.453	192.452	192.467	194.350
0.12623E+11	186.209	186.194	186.194	186.193	186.206	187.810
0.15779E+11	181.981	181.968	181.968	181.967	181.978	183.390
0.18935E+11	178.237	178.226	178.225	178.225	178.235	179.511
0.22090E+11	174.712	174.702	174.701	174.701	174.710	175.892
0.25246E+11	171.217	171.208	171.208	171.207	171.216	172.318
0.28402E+11	168.049	168.040	168.040	168.040	168.048	169.088
0.31558E+11	165.227	165.219	165.218	165.218	165.225	166.213

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.530
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	628 TEMP c08i000	630 TEMP h08o000	624 TEMP s08o000	688 TEMP a08o000	698 TEMP t18i000	782 TEMP a18i000
0.10000E-05	191.345	187.256	175.579	175.492	175.489	175.480
0.20000E-05	209.807	205.900	194.888	194.803	194.800	194.790
31.558	209.807	205.900	194.888	194.803	194.800	194.790
0.31558E+07	224.254	220.479	209.979	209.895	209.892	209.882
0.63116E+07	228.072	224.333	213.968	213.884	213.881	213.871
0.94673E+07	230.390	226.681	216.413	216.330	216.327	216.317
0.12623E+08	232.151	228.462	218.260	218.177	218.174	218.164
0.15779E+08	233.542	229.873	219.741	219.659	219.655	219.646
0.18935E+08	234.730	231.077	220.996	220.913	220.910	220.901
0.22090E+08	235.731	232.095	222.069	221.987	221.984	221.974
0.25246E+08	236.655	233.029	223.039	222.957	222.954	222.945
0.28402E+08	237.424	233.812	223.865	223.783	223.780	223.771
0.31558E+08	238.078	234.480	224.582	224.500	224.497	224.488
0.63115E+08	242.745	239.251	229.680	229.600	229.597	229.588
0.94673E+08	245.451	242.041	232.726	232.648	232.645	232.636
0.12623E+09	247.372	244.039	234.949	234.873	234.870	234.861
0.15779E+09	248.867	245.604	236.723	236.648	236.644	236.636
0.18935E+09	250.012	246.814	238.122	238.049	238.045	238.037
0.22090E+09	250.760	247.623	239.105	239.032	239.029	239.021
0.25246E+09	251.388	248.307	239.955	239.884	239.881	239.873
0.28402E+09	251.329	248.301	240.095	240.025	240.022	240.014
0.31558E+09	251.188	248.210	240.139	240.070	240.068	240.060
0.63115E+09	249.010	246.448	239.514	239.456	239.453	239.446
0.94673E+09	246.989	244.733	238.635	238.584	238.582	238.576
0.12623E+10	242.996	240.960	235.452	235.406	235.404	235.399
0.15779E+10	238.920	237.049	231.979	231.937	231.935	231.930
0.18935E+10	235.119	233.376	228.644	228.605	228.603	228.599
0.22090E+10	231.596	229.952	225.482	225.446	225.444	225.440
0.25246E+10	227.931	226.367	222.109	222.074	222.073	222.069
0.28402E+10	224.816	223.318	219.236	219.203	219.202	219.198
0.31558E+10	222.055	220.615	216.683	216.651	216.650	216.647
0.63115E+10	205.456	204.369	201.376	201.353	201.352	201.349
0.94673E+10	194.700	193.815	191.369	191.350	191.349	191.347
0.12623E+11	188.112	187.364	185.289	185.273	185.273	185.271
0.15779E+11	183.658	183.003	181.184	181.170	181.170	181.168
0.18935E+11	179.755	179.166	177.526	177.514	177.513	177.512
0.22090E+11	176.119	175.576	174.063	174.052	174.051	174.050
0.25246E+11	172.532	172.027	170.619	170.609	170.609	170.608
0.28402E+11	169.291	168.817	167.491	167.482	167.481	167.480
0.31558E+11	166.405	165.958	164.703	164.694	164.694	164.693

1

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.540
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	736 TEMP s18i000	739 TEMP h18i000	741 TEMP c18i000	743 TEMP h18o000	737 TEMP s18o000	801 TEMP a18o000
0.10000E-05	175.547	183.862	184.745	179.611	166.483	166.389
0.20000E-05	194.855	202.525	203.241	198.308	185.899	185.806
31.558	194.855	202.525	203.241	198.308	185.899	185.806
0.31558E+07	209.945	217.103	217.683	212.905	201.046	200.955
0.63116E+07	213.934	220.956	221.498	216.758	205.046	204.955
0.94673E+07	216.379	223.311	223.832	219.124	207.518	207.427
0.12623E+08	218.226	225.099	225.606	220.921	209.389	209.298
0.15779E+08	219.707	226.520	227.014	222.352	210.895	210.805
0.18935E+08	220.962	227.731	228.215	223.572	212.172	212.082
0.22090E+08	222.035	228.757	229.232	224.609	213.268	213.179
0.25246E+08	223.005	229.697	230.166	225.557	214.257	214.167
0.28402E+08	223.831	230.487	230.949	226.357	215.103	215.014

0.31558E+08	224.548	231.162	231.616	227.042	215.840	215.751
0.63115E+08	229.646	235.998	236.407	231.962	221.126	221.039
0.94673E+08	232.693	238.849	239.231	234.891	224.346	224.260
0.12623E+09	234.917	240.905	241.264	237.020	226.733	226.649
0.15779E+09	236.691	242.526	242.867	238.713	228.663	228.581
0.18935E+09	238.091	243.790	244.116	240.044	230.211	230.130
0.22090E+09	239.074	244.650	244.964	240.970	231.336	231.257
0.25246E+09	239.925	245.385	245.689	241.768	232.325	232.248
0.28402E+09	240.065	245.429	245.725	241.873	232.598	232.521
0.31558E+09	240.109	245.384	245.676	241.886	232.767	232.692
0.63115E+09	239.489	244.020	244.271	241.016	233.205	233.141
0.94673E+09	238.613	242.600	242.824	239.963	233.108	233.051
0.12623E+10	235.432	239.048	239.261	236.683	230.503	230.453
0.15779E+10	231.961	235.305	235.511	233.146	227.467	227.421
0.18935E+10	228.628	231.762	231.965	229.764	224.472	224.430
0.22090E+10	225.467	228.440	228.640	226.567	221.576	221.536
0.25246E+10	222.094	224.938	225.137	223.168	218.419	218.381
0.28402E+10	219.222	221.959	222.156	220.274	215.726	215.690
0.31558E+10	216.670	219.314	219.510	217.701	213.324	213.290
0.63115E+10	201.367	203.418	203.595	202.238	198.923	198.898
0.94673E+10	191.361	193.057	193.215	192.115	189.414	189.394
0.12623E+11	185.283	186.731	186.871	185.943	183.657	183.640
0.15779E+11	181.179	182.454	182.581	181.770	179.768	179.753
0.18935E+11	177.521	178.675	178.794	178.065	176.262	176.249
0.22090E+11	174.058	175.128	175.240	174.570	172.908	172.896
0.25246E+11	170.615	171.614	171.721	171.099	169.554	169.544
0.28402E+11	167.488	168.431	168.534	167.950	166.497	166.487
0.31558E+11	164.700	165.595	165.695	165.144	163.769	163.760

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***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.550
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	811 TEMP t24i000	351 TEMP a24i000	127 TEMP s24i000	130 TEMP h24i000	132 TEMP c24i000	134 TEMP h24o000
0.10000E-05	166.384	166.362	166.417	172.568	170.768	161.453
0.20000E-05	185.801	185.780	185.832	191.419	189.582	180.721
31.558	185.801	185.780	185.832	191.419	189.582	180.721
0.31558E+07	200.950	200.929	200.979	206.126	204.253	195.728
0.63116E+07	204.950	204.929	204.979	210.003	208.118	199.682
0.94673E+07	207.423	207.402	207.451	212.399	210.514	202.149
0.12623E+08	209.294	209.272	209.321	214.219	212.336	204.025
0.15779E+08	210.800	210.779	210.828	215.676	213.794	205.533
0.18935E+08	212.077	212.056	212.105	216.916	215.037	206.817
0.22090E+08	213.174	213.153	213.201	217.974	216.098	207.919
0.25246E+08	214.162	214.141	214.190	218.939	217.065	208.917
0.28402E+08	215.010	214.989	215.037	219.757	217.886	209.771
0.31558E+08	215.746	215.725	215.773	220.460	218.590	210.509
0.63115E+08	221.034	221.014	221.060	225.540	223.701	215.876
0.94673E+08	224.256	224.236	224.281	228.611	226.804	219.185
0.12623E+09	226.645	226.625	226.669	230.869	229.094	221.660
0.15779E+09	228.577	228.557	228.601	232.684	230.940	223.678
0.18935E+09	230.126	230.107	230.150	234.130	232.415	225.311
0.22090E+09	231.253	231.234	231.276	235.164	233.478	226.519
0.25246E+09	232.244	232.225	232.266	236.068	234.410	227.590
0.28402E+09	232.518	232.500	232.540	236.271	234.641	227.944
0.31558E+09	232.689	232.671	232.710	236.376	234.774	228.191
0.63115E+09	233.138	233.123	233.156	236.289	234.914	229.286
0.94673E+09	233.049	233.035	233.065	235.813	234.605	229.674
0.12623E+10	230.451	230.439	230.465	232.956	231.876	227.437
0.15779E+10	227.419	227.408	227.432	229.737	228.753	224.679
0.18935E+10	224.428	224.418	224.440	226.603	225.694	221.904

0.22090E+10	221.534	221.525	221.546	223.598	222.748	219.178
0.25246E+10	218.380	218.371	218.391	220.356	219.556	216.162
0.28402E+10	215.688	215.680	215.699	217.593	216.833	213.587
0.31558E+10	213.288	213.280	213.299	215.131	214.406	211.283
0.63115E+10	198.896	198.890	198.904	200.337	199.813	197.461
0.94673E+10	189.393	189.388	189.399	190.588	190.174	188.263
0.12623E+11	183.639	183.635	183.645	184.662	184.319	182.704
0.15779E+11	179.753	179.749	179.758	180.655	180.359	178.947
0.18935E+11	176.249	176.246	176.253	177.067	176.804	175.535
0.22090E+11	172.895	172.892	172.899	173.655	173.415	172.247
0.25246E+11	169.543	169.540	169.547	170.254	170.034	168.949
0.28402E+11	166.487	166.484	166.490	167.160	166.955	165.936
0.31558E+11	163.759	163.757	163.762	164.399	164.208	163.245

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
 38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.560
 FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	128 TEMP s24o000	361 TEMP t24o000	4271 TEMP g24i000	4269 TEMP g24o000	5135 TEMP m24i000	4872 TEMP m24o000
0.10000E-05	140.535	140.329	129.029	128.855	120.079	119.102
0.20000E-05	161.077	160.879	150.589	150.421	142.264	141.314
31.558	161.077	160.879	150.589	150.421	142.264	141.314
0.31558E+07	177.042	176.849	167.269	167.104	159.378	158.444
0.63116E+07	181.244	181.052	171.642	171.477	163.853	162.921
0.94673E+07	183.895	183.704	174.418	174.253	166.710	165.781
0.12623E+08	185.905	185.715	176.520	176.357	168.876	167.951
0.15779E+08	187.544	187.356	178.246	178.083	170.660	169.737
0.18935E+08	188.932	188.744	179.702	179.540	172.164	171.245
0.22090E+08	190.137	189.950	180.975	180.814	173.484	172.567
0.25246E+08	191.209	191.022	182.097	181.936	174.642	173.727
0.28402E+08	192.145	191.960	183.087	182.926	175.669	174.757
0.31558E+08	192.972	192.787	183.968	183.808	176.589	175.679
0.63115E+08	198.972	198.793	190.359	190.203	183.266	182.380
0.94673E+08	202.776	202.601	194.455	194.304	187.585	186.720
0.12623E+09	205.685	205.514	197.617	197.468	190.940	190.095
0.15779E+09	208.100	207.933	200.259	200.114	193.760	192.933
0.18935E+09	210.093	209.930	202.455	202.313	196.116	195.306
0.22090E+09	211.631	211.471	204.175	204.036	197.981	197.187
0.25246E+09	213.016	212.859	205.734	205.597	199.678	198.899
0.28402E+09	213.644	213.490	206.507	206.373	200.570	199.806
0.31558E+09	214.145	213.994	207.142	207.010	201.316	200.565
0.63115E+09	217.341	217.212	211.429	211.316	206.507	205.868
0.94673E+09	219.248	219.135	214.112	214.014	209.838	209.279
0.12623E+10	218.067	217.966	213.456	213.368	209.625	209.125
0.15779E+10	216.088	215.996	211.857	211.777	208.351	207.895
0.18935E+10	213.912	213.826	209.972	209.897	206.715	206.293
0.22090E+10	211.647	211.567	207.929	207.859	204.862	204.467
0.25246E+10	209.000	208.924	205.456	205.390	202.542	202.168
0.28402E+10	206.730	206.658	203.332	203.269	200.543	200.187
0.31558E+10	204.686	204.616	201.411	201.351	198.729	198.388
0.63115E+10	192.479	192.427	189.983	189.939	187.965	187.713
0.94673E+10	184.208	184.166	182.162	182.126	180.521	180.320
0.12623E+11	179.274	179.239	177.537	177.507	176.151	175.982
0.15779E+11	175.946	175.915	174.422	174.395	173.210	173.064
0.18935E+11	172.834	172.807	171.459	171.436	170.370	170.239
0.22090E+11	169.759	169.734	168.487	168.465	167.483	167.364
0.25246E+11	166.637	166.614	165.451	165.431	164.518	164.408
0.28402E+11	163.761	163.739	162.641	162.623	161.764	161.661
0.31558E+11	161.188	161.168	160.126	160.109	159.296	159.200

***** ANSYS - ENGINEERING ANALYSIS SYSTEM REVISION 5.1 24 *****
38303 VERSION=HP 9000/7XX 20:57:36 JUN 26, 1996 CP= 36991.570
FOR SUPPORT CALL ROBERT BAHNEY PHONE (702) 794-5337 FAX (702) 794-1844

40 BWR MOX MPC/WP at 100 years

***** ANSYS POST26 VARIABLE LISTING *****

TIME	5728 TEMP	5727 TEMP	6241 TEMP
	i24i000	i24o000	o24o000
0.10000E-05	28.9695	27.8897	26.1379
0.20000E-05	71.9333	70.8546	69.1381
31.558	71.9335	70.8546	69.1381
0.31558E+07	99.9683	98.8949	97.1270
0.63116E+07	106.741	105.673	103.902
0.94673E+07	111.130	110.068	108.300
0.12623E+08	114.496	113.440	111.677
0.15779E+08	117.239	116.187	114.427
0.18935E+08	119.574	118.527	116.772
0.22090E+08	121.607	120.564	118.812
0.25246E+08	123.351	122.313	120.565
0.28402E+08	124.931	123.897	122.152
0.31558E+08	126.397	125.367	123.625
0.63115E+08	136.850	135.856	134.148
0.94673E+08	143.716	142.750	141.075
0.12623E+09	149.132	148.191	146.549
0.15779E+09	153.717	152.799	151.187
0.18935E+09	157.586	156.690	155.106
0.22090E+09	160.748	159.872	158.315
0.25246E+09	163.639	162.781	161.252
0.28402E+09	165.468	164.628	163.125
0.31558E+09	167.056	166.232	164.755
0.63115E+09	178.682	177.986	176.720
0.94673E+09	186.290	185.685	184.576
0.12623E+10	188.711	188.171	187.180
0.15779E+10	189.258	188.767	187.865
0.18935E+10	188.975	188.521	187.689
0.22090E+10	188.124	187.698	186.920
0.25246E+10	186.556	186.154	185.421
0.28402E+10	185.185	184.803	184.107
0.31558E+10	183.900	183.534	182.869
0.63115E+10	176.542	176.275	175.794
0.94673E+10	171.066	170.852	170.471
0.12623E+11	168.083	167.904	167.586
0.15779E+11	166.110	165.955	165.679
0.18935E+11	163.936	163.797	163.553
0.22090E+11	161.504	161.377	161.153
0.25246E+11	158.909	158.792	158.586
0.28402E+11	156.440	156.330	156.139
0.31558E+11	154.221	154.117	153.938

***** ROUTINE COMPLETED ***** CP = 36991.580

End of batch input file

PURGE ALL SOLUTION AND POST DATA
SAVE ALL MODEL DATA

ALL CURRENT ANSYS DATA WRITTEN TO FILE NAME= mpc40mxx.db
FOR POSSIBLE RESUME FROM THIS POINT

NUMBER OF WARNING MESSAGES ENCOUNTERED= 267
NUMBER OF ERROR MESSAGES ENCOUNTERED= 0


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|                                     |
|               ANSYS RUN COMPLETED |
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|                                     |
|      REV. 5.1  24                  |
|                                     |
| CP TIME      (sec) = 36995.960      |
| ELAPSED TIME (sec) = 41717.000      |
|                                     |
|      HR 9000/7XX                  |
|                                     |
| TIME = 20:57:41                    |
| DATE = 06/26/96                    |
|                                     |
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