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HFIR DISSOLUTION NUCLEAR CRITICALITY ANALYSIS INFORMATION

H-Canyon Nuclear and Criticality Safety Engineering has completed development of the documentation necessary to complete the September 30, 2014, H-Canyon PBI milestone that states:

> Complete the analytical work to develop proposed HFIR Criticality Safety Limits associated with receipt and dissolving of HFIR material.

Attached to this memorandum are the following:

- Attachment 1- HFIR Dissolution Nuclear Criticality Analysis
- Attachment 2 - SCALE 5/KENO VI sample input

As documented in Attachment 1, the safety of HFIR dissolution in H-Canyon has been evaluated. Due to the composition and geometry of the HFIR elements and the chemistry of the dissolution process, there are no credible criticality events associated with HFIR dissolution, with the exception of potential Pu polymerization. There are no mass, concentration, or soluble poison CSLs required for HFIR dissolution in H-Canyon. If SRNL, in the development of the HFIR flow sheet, determines that Pu polymerization is a credible event, a minimum nitric acid PPL and controls will be developed. However, there is no analysis or CSLs needed for this event. The boron in the borated stainless steel posts is not required, and, therefore, blackness testing is not required for criticality safety.

Please contact Brittany Williamson (208-3887) or John Lint (208-2400) should you have any questions or comments regarding this analysis.

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ATTACHMENT 1 – HFIR DISSOLUTION NUCLEAR CRITICALITY ANALYSIS

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1.0 INTRODUCTION

The purpose of this analysis is to demonstrate the safety of High Flux Isotope Reactor (HFIR) dissolution from a criticality safety perspective and to establish any Criticality Safety Limits (CSLs) that may be necessary. HFIR fuel consists of two annular elements that are designed to be nested together with a beryllium reflector in the reactor configuration. HFIR cores are currently stored in L-Area as separate inner elements and outer elements, each on a unique aluminum carrier. HFIR elements will be shipped to H-Canyon in the 70-ton Cask Railcar and loaded into the dissolver with the HFIR insert installed. The HFIR insert consists of a small well for the inner fuel element and a large well for the outer fuel element.

2.0 PARAMETERS AND ASSUMPTIONS

2.1 MODELING ASSUMPTIONS

The SCALE model chosen for this analysis was derived from the HFIR model created by Oak Ridge National Laboratory (ORNL) for Cycle 400, which is documented in *Development of a SCALE Model for High Flux Isotope Reactor Cycle 400*, ORNL/TM-2011/367. Cycle 400 is representative of the HFIR fuel elements that are stored in L-Area and will be processed in H-Canyon. The original input was provided by ORNL and is a model of the entire HFIR, including fuel regions, control rods, flux trap, experimental regions, and Be reflector. For this analysis, only the fuel region portion of the input was extracted and inserted into a model of the dissolver with the HFIR insert. To verify that this was an accurate representation of the HFIR fuel, the 'read volume' card was used in the SCALE input which results in ^{235}U mass data in the output. The ^{235}U mass data given in the SCALE output matched the ^{235}U mass data given in the HFIR Appendix A Agreements to within 1 gram. This information, along with the fact that the model was developed by the originator of the fuel, provides high confidence that this model is accurate and realistic.

2.2 ISOTOPICS

The original isotopics of the HFIR fuel were not altered and are ~93 wt. % ^{235}U. All fissile solution is modeled at 95 wt. % ^{235}U and 5 wt. % ^{238}U. When Pu is modeled, it is modeled at 95 wt. % ^{239}Pu and 5 wt. % ^{240}Pu.

2.3 BURNUP

The end of life enrichment for HFIR cores is expected to be ~86 wt. % ^{235}U. However, no credit is taken for burnup. All inputs for this analysis use pre-irradiation (beginning of life) ^{235}U masses and enrichment.

2.4 INSERT DIMENSIONS

Dimensions for the HFIR insert were obtained from a memo issued by engineering, *H-Canyon Dissolver HFIR Insert Dimensions*, SRNS-H8100-2014-00075, Rev. 1. This analysis is applicable to both Dissolver 6.1D and 6.4D. The dimensions of 6.4D were used for this analysis and bound 6.1D. 6.4D is larger and may contain more fissile mass and have less neutron leakage, so it is

conservative to use the 6.4D dimensions for this analysis. The table that contains the dimensions from the memo is reproduced below in Table 1 below.

Table 1 HFIR Insert Dimensions

The volume of the holes is not discussed in the insert dimension memo, so it will be discussed here. Drawing S5-2-3613 shows that there are 20 holes per row on the small well, and there are 30 holes per row on the large well. Each hole has a 1" diameter. Drawing S5-2-14901Q shows that there are 10 rows of holes in each well. In each well, there is a lower section of holes and an upper section of holes, as shown in Figure 1 below.

Figure 1 HFIR Insert Hole Spacing (S5-2-3612)

Drawing S5-2-3612 shows that there are 10 rows of holes and 2' 3" (27") from the center of the first row of holes to the center of the last row of holes in the lower section. This means there are 28" from the bottom of the first row of holes to the top of the last row of holes in the lower section. There are 8 rows of holes and 1' 9" (21") from the center of the first row of holes to the center of the last row of holes in the upper section. This means there are 22" from the bottom of the first row of holes to the top of the last row of holes in the upper section.

According to drawing S5-2-3613, the pipe that constitutes the inner (small) well has an OD of 13" and an ID of 12.25". Therefore, the pipe thickness is 0.375". To determine the fraction of pipe that contains solution in the holes, the volume of the holes is divided by the volume of that portion of the pipe. The volume of the holes is calculated from the area of the holes times the thickness of the pipe, *t*. This is demonstrated in the equations below for the lower portion of the small well.

$$V_{holes} = \#\ of\ holes * A_{holes} * t$$
$$V_{holes} = 200\pi r^2 * t$$
$$V_{holes} = 200\pi(0.5")^2 * 0.375"$$
$$V_{holes} = 58.905\ in^3$$
$$V_{pipe} = V_{outer} - V_{inner}$$
$$V_{pipe} = A_o l - A_i l$$
$$V_{pipe} = \pi {r_o}^2 l - \pi {r_i}^2 l$$
$$V_{pipe} = \pi l({r_o}^2 - {r_i}^2)$$
$$V_{pipe} = \pi 28"(6.5^2 - 6.125^2)$$
$$V_{pipe} = 416.457\ in^3$$
$$F = \frac{V_{holes}}{V_{pipe}}$$
$$F = \frac{58.905}{416.457}$$
$$F = 0.141$$

Table 2 Hole Fraction

Therefore, 0.15 is used as the volume fraction of the pipe that is uranyl nitrate. To simplify the computer model, this value is conservatively used for the entire length of pipe, even though the holes are only located in the bottom portion of the pipe. Since the holes are modeled as fissile solution and reduce the amount of stainless steel in the model, maximizing the hole fraction is conservative.

2.5 FIXED AND BURNABLE POISONS

Drawing S5-2-3613 indicates that the center post in both wells is constructed from 304 stainless steel containing 1% boron. There is no credit taken for this fixed poison. The posts are modeled only as stainless steel.

Also, the inner HFIR element contains some boron as a burnable poison, according to ORNL/TM-2011/367 and the Appendix A documents. There is no credit taken for this burnable poison. The boron was removed (commented out) from the material cards in the SCALE inputs.

2.6 k_{SAFE} DETERMINATION

2.6.1 Area of Applicability (AOA)

The following table presents the AOA for uranium and plutonium solutions in the dissolver. The set of solution experiments is in good agreement with the candidate cases presented in this evaluation.

Table 3 AOA Comparison, Uranium and Plutonium Solutions

Validation Parameter	Highly Enriched Uranium (HEU) Solutions (SRNS-RP-2008-00153, Section 5.2) **Experiments**	Pu Solutions (SRNS-RP-2008-00153, Section 4.2) **Experiments**	Uranyl Nitrate and Plutonium Nitrate Solutions **Candidate**	**Comments**
Fissionable Materials	Uranyl Nitrate $UO_2(NO_3)_2$, Uranium Oxyflouride UO_2F_2	Plutonium Nitrate $Pu(NO_3)_4$	Uranyl Nitrate $UO_2(NO_3)_2$ Plutonium Nitrate $Pu(NO_3)_4$	Within AOA
Fissile Enrichment	93.2 wt. % ^{235}U	0.54 wt. % < ^{240}Pu < 18.91 wt. %	Max. 95.0 wt. % ^{235}U Min 5.0 wt. % ^{240}Pu	Within AOA, See Note 1
Moderating Materials	Water	Water	Water	Within AOA
H/X	$H/^{235}U$ = 50 – 1,300	$H/^{239}Pu$ = 90-2,800	$H/^{235}U$ = 48 – 1,072 $H/^{239}Pu$ = 55,552-111, 260	Outside AOA, See Note 2
Reflecting Materials	Concrete, Plexiglas, Water, or None	Water or None	Water with $UO_2(NO_3)_2$ and/or $Pu(NO_3)_4$	Within AOA
Geometry	Single unit spheres, cylinders and arrays of cylinders	Single spheres, single slabs, arrays of cylinders	Arrays of cylinders	Within AOA
Neutron Spectrum: Average Energy Group Causing Fission (AEG)	Thermal: 186.7 < AEG (238) < 220.6	Thermal: 195.7 < AEG (238) < 219.8	Thermal: 208.7 < AEG(238) < 221.9	Outside AOA, See Note 3
Neutron Spectrum: Average Lethargy (eV) Causing Fission (ALF)	Thermal: 0.032 < ALF (eV) < 0.53	Thermal: 0.04 < ALF (eV) < 0.34	Thermal: 0.029 < ALF (eV) < 0.092	Outside AOA, See Note 3
Poisons	None	None	None	Within AOA
Bias (see Section 2.6.2)	Keno VI LTL = 0.990	Min. LTB ($H/^{239}Pu$) = 0.993	Applied Biased k_{eff} = 0.990	
Number of Experiments	85	78	Total : 163	

Note 1. The candidate system enrichment for uranium is within 10 wt. % of the enrichment in the validation experiments, and therefore no additional AOA margin is needed (SRNS-IM-2009-00035, Chapter 3.2).

Note 2. The candidate system H:Pu is outside the range of the experiments due to the dilute concentration of plutonium. However, the H:Pu value is above the minimum safe value in ANSI/ANS-8.1, *Nuclear Criticality Safety in Operations with Fissionable Material Outside Reactors* (H: ^{239}Pu=3,630), and no additional AOA margin will be added. Only the fuel regions were considered for the H:U values; the low-concentration bulk solution values (H: ^{235}U=9,304) were not included because they are also above the minimum safe value in ANSI/ANS-8.1 (H: ^{235}U=2,250) and are not the primary concern for the AOA evaluation.

Note 3. The maximum AEG value is slightly outside the maximum AEG range of the experiments. Also, the minimum ALF is slightly outside the minimum ALF range of the experiments. Both of these values indicate that the neutron spectrum is slightly more thermal than the experiments. This is due to the large volume of low-fissile-concentration bulk solution in the candidate system. Since the candidate system is still in the thermal range, no additional AOA margin will be added.

2.6.2 Bias

Per the validation document, SRNS-RP-2008-00153, the uranium solution has a biased k_{eff} given by an LTL=0.990. The LTL covers an H/X range of $50 < H/^{235}U < 1{,}300$.
Also per the validation, the plutonium nitrate solution has an LTB provided as a function of $H/^{239}Pu$. The function is:

$$LTB=9.9341E\text{-}1 + \left(5.3803E\text{-}6^{*}\frac{H}{^{239}Pu}\right) + \left(-9.5760E\text{-}10^{*}\left(\frac{H}{^{239}Pu}\right)^{2}\right)$$

The LTB function covers an H/X range of $90 < H < 2{,}800$. The function was found over its range: LTB (90) = 0.993 and LTB (2,800) = 1.001. This indicates that the lowest possible LTB for these plutonium solutions is found at the lowest H:X value and is 0.993, which is higher than the LTL for uranium solutions. Therefore, an LTL of 0.990 (implies bias = 0.01) for uranium solutions over the range of applicability provided in SRNS-IM-2009-00035 is used.

2.6.3 Minimum Subcritical Margin (MSM)

The biased k_{eff} does not incorporate a MSM. The MSM, by definition, must be large enough to protect against reasonable changes to the system being analyzed leading to an unsafe condition using the evaluated k_{safe}. The MSM depends on several items and is used to ensure subcriticality for systems with calculated k_{eff} less than k_{safe}.

Maintaining an adequate criticality safety margin helps ensure that the analyzed system is subcritical. The calculated $k_{eff} + 2\sigma$ value for the system shall not exceed the subcritical limit or k_{safe} value. Guidance for choosing an appropriate MSM for the system being analyzed is provided in SRNS-IM-2009-00035, Chapter 3.3. This guidance asks the analyst to consider a series of seven questions and make a judgment based on the answers.

1. Is the system/process simple (versus being complex)?
   Yes. This is an evaluation with simple geometry. The dissolver is modeled as a cylinder containing an array of nested cylinders.
2. Does the fissile material maintain its shape and composition during normal and credible abnormal events?
   No. The purpose of the dissolution process is to change the material's shape and composition. However, the system was evaluated throughout the range of potential configurations. Also, the plutonium is maintained in solution form throughout the process and is evaluated in that configuration.
3. Does a thorough validation exist for the analysis method?
   Yes. Validation report SRNS-RP-2008-00153 is applicable to the fissile materials considered in this analysis.
4. Does the validation for the analysis method use many data points from benchmark experiments by several independent experimenters?
   No. The validation report (SRNS-RP-2008-00153) identified that the uranium solution experiments were from a single laboratory with an unidentified data scatter. An MSM of at least 0.03 was recommended by the validation (SRNS-RP-2008-00153, Section 5.2.4).

5. Has a subset of the validation benchmark experiments with an acceptable degree of 'similarity' been identified and is the apparent bias uncertainty for this subset less than the desired MSM? Yes. There are subsets identified that are similar to the analyzed cases. Table 3 provides the subsets of validation benchmark experiments and identifies the degree of similarity to the candidate cases. The corresponding LTL is listed. Table 4 provides a summary of the candidate material, LTL, bias, and MSM applied. Note that the validation document (SRNS-RP-2008-00153) only provides the (bias + bias uncertainty). This evaluation regards the bias uncertainty as bounded by the reported (bias + bias uncertainty).

Table 4 Summary of Experiment Subsets and Bias

Fissile Material	Number of Experiments (Subset)	LTL	Bias + Bias Uncertainty	MSM Applied
Uranium-Plutonium Solution	163	0.990	0.010	0.030

The bias uncertainty (0.010) is less than the nominal minimum MSM of 0.03 suggested by Section 5.2.4 of SRNS-RP-2008-00153. The EU-Pu Solution MSM is set to 0.03, as recommended by the validation document. As demonstrated in Section 2.6.4, both the MSM and bias (plus the bias uncertainty) are used in conjunction to derive the applied the k_{safe} value.

6. To what degree are the process calculations within the AOA of the validation calculations? The benchmarks in the cited validations cover a range of H/X, AEG, and ALF that are similar with the analyzed system AOA (see Table 3).
7. How sensitive is the k_{eff} of the system to credible physical/chemical changes in the system? All materials were taken at their theoretical densities. The resulting mixtures were analyzed at the highest concentration considered reasonable for this system. Therefore, all credible physical and chemical changes are bound by this analysis.

Not all questions are answered in a favorable manner. For uranium solutions, Section 5.2.4 of the validation (SRNS-RP-2008-00153) specifically recommends use of an MSM of 0.03 due to the data coming from one experimental facility with an unexplained data scatter. Therefore, an MSM of 0.03 is applied to the use of uranium-plutonium solutions.

2.6.4 k_{safe} Determination

k_{safe} is defined as follows:

$$k_{safe} = \text{Biased } k_{eff} - \text{AOA} - \text{MSM}$$

The following table presents the determined k_{safe} value for use in this evaluation.

Table 5 k_{safe} Determination

System	Biased k_{eff}	(Less) AOA	(Less) MSM	k_{safe}
Uranium-Plutonium Solution (No Poison)	0.990	0.000	0.030	0.960

2.7 VALIDATION OF ORNL MODEL

In order to validate that the SCALE model provided by ORNL is a reasonable and accurate model for criticality safety evaluations, SCALE was used to perform a Monte Carlo integration of the volumes of the many units in the model. Along with calculating the volume of each unit, SCALE also calculates the total mass of each unit and provides this data in a table in the output. SCALE also provides a "mixing table" in the output which gives the weight fraction of each nuclide for every material number. These two pieces of data (overall mass and nuclide-specific weight fractions) can be combined to determine how much mass is being modeled in the input.

When this technique was performed on the ORNL model of HFIR, the SCALE output mass calculations agree to within 1 gram ^{235}U based on the Appendix A mass values for both the inner and the outer element. This indicates that the ORNL model is a reasonable and accurate model for criticality safety evaluations.

2.7.1 SCALE 6 vs. SCALE 5

The original input provided by ORNL was written for SCALE 6, and it included many isotopes that do not exist in the validated SCALE 5 cross section libraries. To run the input in SCALE 5, all the isotopes were removed (commented out) such that only H, O, Al, and the U isotopes remained. Three SCALE 6 cases were run, 1.) with all original isotopes, 2.) with only boron removed, 3.) with all isotopes removed except H, O, Al, and U isotopes.

The lowest k_{eff} is for the case with all the original isotopes. When boron is removed, k_{eff} increases. When the remaining isotopes are removed, k_{eff} increases further. This indicates that modeling the fuel as consisting of H, O, Al, and U overestimates the calculated k_{eff}, and use of the modified SCALE 5 inputs is conservative.

3.0 NORMAL CONDITIONS

3.1 WITH FRESH ACID

The mass of the inner element is 2,595.8 g ^{235}U. The mass of the outer element is 6,804.4 g ^{235}U. Also, there are 4,571.7 moles of Al in each HFIR core. A core consists of an inner element and an outer element. These values are given in the HFIR NCSE Scope of Work Memo, SRNS-H8100-2014-00004 and have been validated against the Appendix A documents. The preferred dissolver for HFIR dissolution is 6.4D (although either dissolver may be used), and a typical volume for HFIR dissolution is 13,500 L. It is assumed that one core (one inner element and one outer element) will be charged in each dissolution. The resulting ^{235}U concentration and Al molarity after each dissolution is shown in the Table 6 below.

Table 6 Normal ^{235}U Concentration and Al Molarity

	Concentration (g ^{235}U/L)	Al Molarity (M)
After 1 core is dissolved	0.70	0.34
After 2 cores are dissolved	1.39	0.68
After 3 cores are dissolved	2.09	1.02
After 4 cores are dissolved	2.79	1.35
After 5 cores are dissolved	3.48	1.69
After 6 cores are dissolved	4.18	2.03

The facility will strive to keep the dissolver solution below the aluminum solubility point, which is ~2 M Al in 2 M HNO_3 at 20° C. Therefore, it is assumed that the facility will not charge more than 5 cores to the dissolver, because 6 cores would result in aluminum precipitation. Although aluminum precipitation does not cause a criticality concern, it can cause dip tube blockage and other operations concerns.

Assuming the facility will only charge up to 5 HFIR cores in a batch, which results in a concentration of 3.48 g ^{235}U/L, the concentration change was calculated at multiple points throughout the dissolution process of the 5th core. The dissolution process is divided into 10 phases (Phase 0 through Phase 9). The outer HFIR element is divided into 9 radial regions, and the inner HFIR element is divided into 8 radial regions. To simulate the dissolution process, a radial region (starting from the outside) is removed for each subsequent dissolution phase. For example, at Phase 0, the inner element and outer element are modeled intact inside the wells of the HFIR insert. At Phase 1, the outer radial region is removed from both elements and that mass is assumed to have entered the bulk solution. At Phase 2, the next outer radial region is removed from each element and that mass is assumed to have entered the bulk solution. This continues until each element is completely dissolved. Removing the material from the outermost radial region for each phase is representative of how the fuel will dissolve since there are holes in the outside of the wells to allow fresh acid to interact most with the outer surface of the fuel element. The Phase 0 configuration is shown in Figure 2 below.

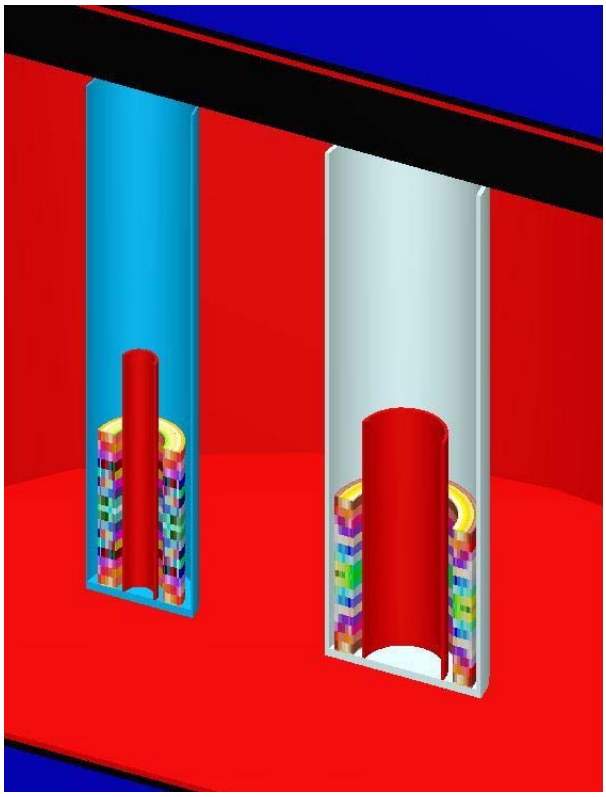

Figure 2 Normal HFIR Dissolution, 1 core, Phase 0

To account for the ^{235}U in the bulk solution between the fuel plates, the fuel ^{235}U atom density was increased by an amount equivalent to an upper bound concentration of 5.65 g ^{235}U /L. Refer to the Section 4.2 of this analysis to see how this was calculated. Using a constant value for the ^{235}U contribution minimized changes to the models for dissolution.

Table 7 shows the concentration change for each dissolution phase of dissolving the 5th HFIR core in a batch, assuming a normal volume of 13,500 L.

Table 7 HFIR Dissolution Phases

Phase	Starting Concentration (g ^{235}U/L)	Starting Concentration (g U/L)	Inner Element Mass Lost (g ^{235}U)	Outer Element Mass Lost (g ^{235}U)	Concentration Increase (g ^{235}U/L)
0	2.79	2.94	341.65	333.17	0.05
1	2.84	2.99	305.40	427.07	0.05
2	2.89	3.05	623.16	509.43	0.08
3	2.97	3.14	558.15	1252.35	0.13
4	3.11	3.28	422.15	1457.32	0.14
5	3.25	3.42	155.60	1429.06	0.12
6	3.36	3.55	121.18	601.90	0.05

Phase	Starting Concentration (g ^{235}U/L)	Starting Concentration (g U/L)	Inner Element Mass Lost (g ^{235}U)	Outer Element Mass Lost (g ^{235}U)	Concentration Increase (g ^{235}U/L)
7	3.42	3.60	67.59	491.63	0.04
8	3.46	3.65	- *	298.46	0.02
9	3.48**	3.67**	-	-	-

*There is no inner element mass value for Phase 8 because there are only 8 radial regions in the inner element, and it is completely dissolved after Phase 7.
**These values are the final concentration values after all the material is dissolved.

Table 8 provides the k_{eff}, sigma, and k_{eff} + 2*sigma values for the normal condition.

Table 8 Normal HFIR Dissolution Results

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE00	0.743	0.0017	0.747
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE01	0.732	0.0018	0.736
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE02	0.725	0.0014	0.728
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE03	0.715	0.0020	0.719
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE04	0.685	0.0015	0.689
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE05	0.638	0.0017	0.641
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE06	0.571	0.0015	0.574
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE07	0.512	0.0014	0.515
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE08	0.431	0.0003	0.432
ORNL2_HFIR_DISSOLVING_NORMAL_PHASE09	0.430	0.0003	0.431

Figure 3 shows how k_{eff} changes over the normal dissolution process.

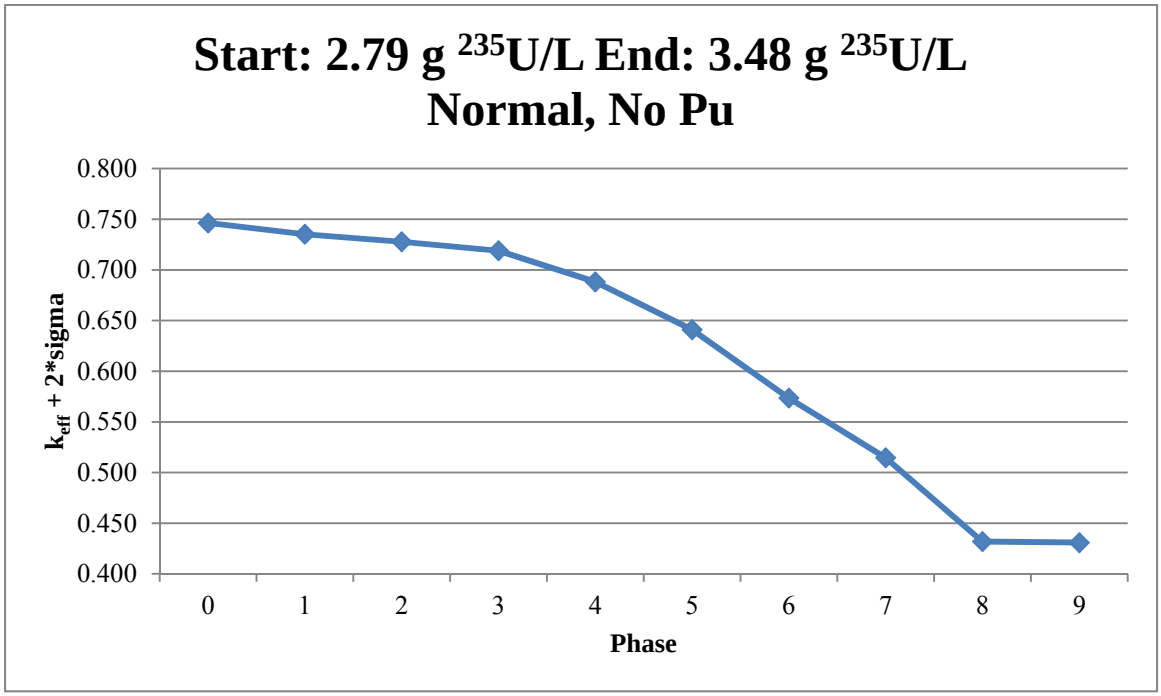

Figure 3 Normal HFIR Dissolution Results

All normal cases are below the k_{safe} value of 0.96, and the highest k_{eff} + 2*sigma value is 0.747. The straight portion of the graph between Phases 8 and 9 is reasonable because the concentration only changed from 3.46 to 3.48 g ^{235}U/L, and there was only ~300 g ^{235}U remaining in the well in Phase 8. This is less than a single mass and does not contribute significantly to the system multiplication. Therefore, Phase 8 and Phase 9 are very similar.

The fissile mass in the wells contributes more to the overall system multiplication than the fissile material in the bulk solution. This trend can be seen if k_{eff} is graphed as a function of mass remaining in the well, as shown in Figure 4 below.

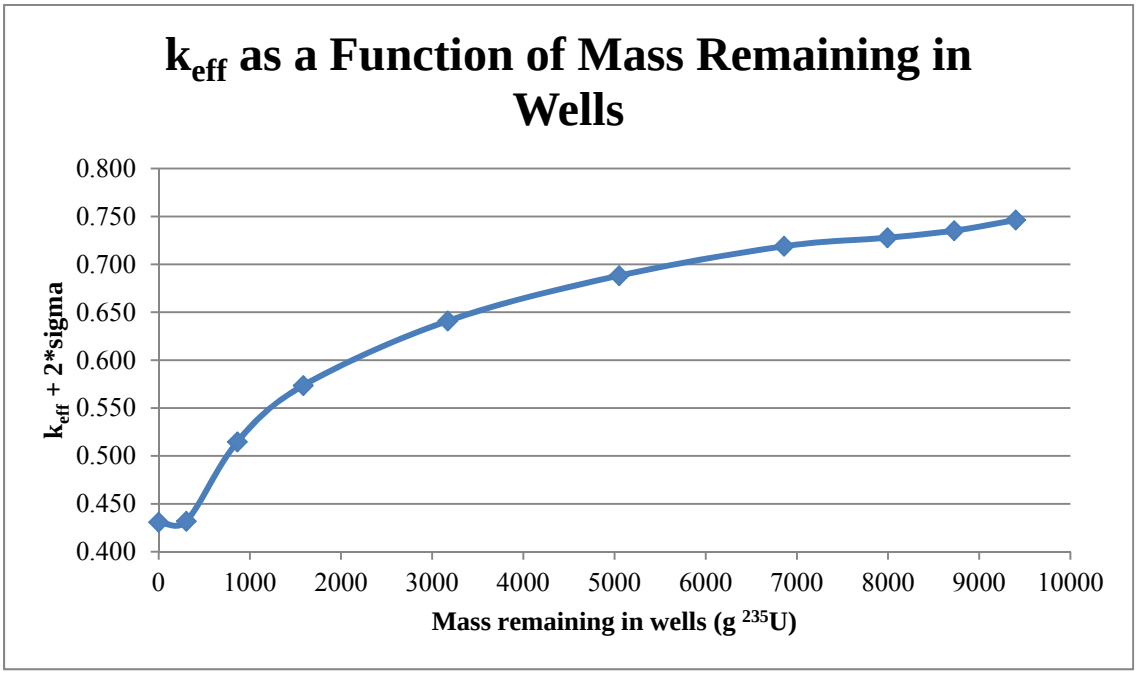

Figure 4 Normal Results as a Function of Mass Remaining in the Wells

Once there is less than a single mass remaining in the wells, k_{eff} ceases to change significantly between phases.

3.2 WITH RECYCLED ACID

There is a potential to use recycled HB-Line column waste as the acid for HFIR dissolution. This material may have up to 0.25 g Pu/L at 95 wt. % ^{239}Pu and 5 wt. % ^{240}Pu. This concentration was added to the bulk solution in the dissolver models to determine the effect of the additional fissile material. This concentration was also converted to an atom density for Pu^{239} and Pu^{240} and added to the fuel regions to simulate the bulk solution being present between the fuel plates. For additional U and Pu in the fuel regions due to the fissile/acid solution in the cooling channels, it is assumed that the entire volume of that fuel region has the maximum atom density of the additional U & Pu. This overestimates the amount of U and Pu in the fuel region and is conservative. All other parameters are the same as for the normal conditions.

Table 9 provides the k_{eff}, sigma, and k_{eff} + 2*sigma values for the normal condition with Pu.

Table 9 Normal HFIR Dissolution Results with Pu

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE00	0.749	0.0014	0.752
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE01	0.742	0.0008	0.744
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE02	0.730	0.0016	0.734
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE03	0.723	0.0008	0.725

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE04	0.692	0.0013	0.695
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE05	0.653	0.0016	0.656
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE06	0.579	0.0010	0.582
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE07	0.523	0.0013	0.526
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE08	0.466	0.0004	0.467
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE09	0.469	0.0004	0.470

Figure 5 shows how k_{eff} changes over the normal dissolution process with Pu.

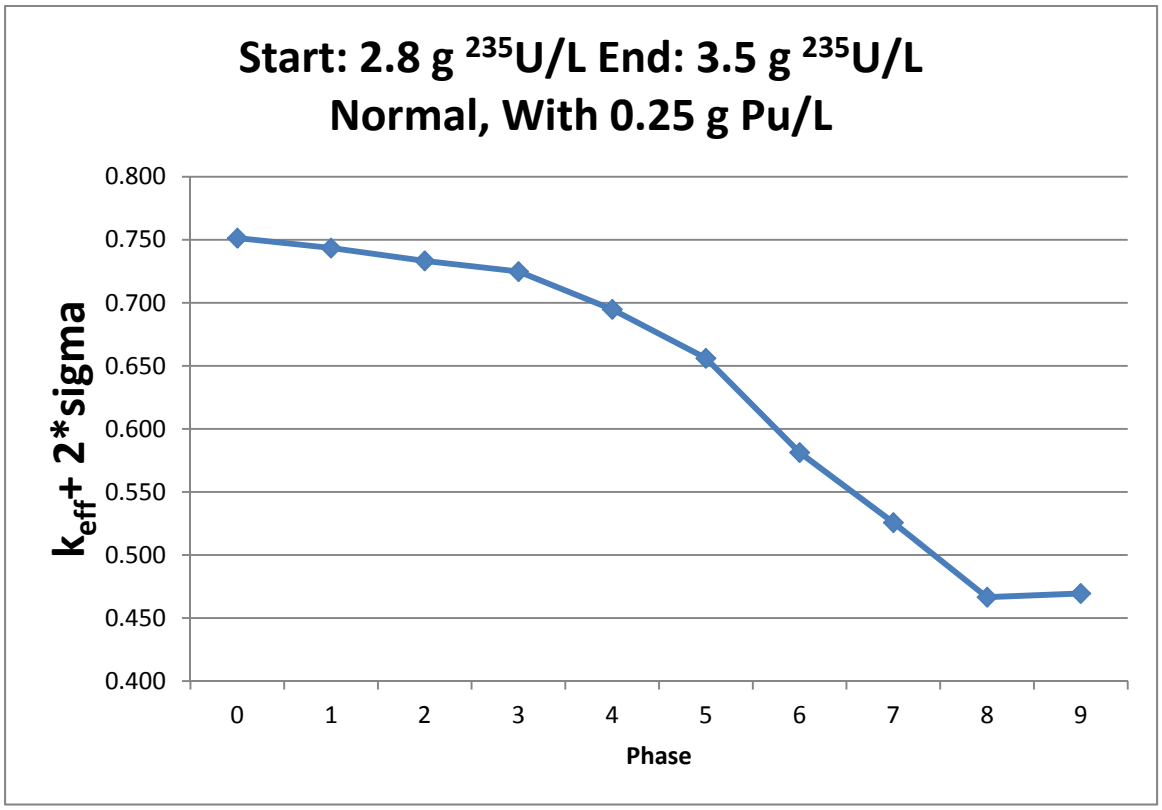

Figure 5 Normal HFIR Dissolution Results with Pu

All Pu cases are slightly higher than the non-Pu cases, but all cases are still well below the k_{safe} value of 0.96, and the highest k_{eff} + 2*sigma value is 0.752. The average increase in k_{eff} + 2*sigma between the non-Pu and the Pu cases was 0.014.

4.0 ABNORMAL CONDITIONS

4.1 OVER-MASS

HFIR fuel consists of two large, discreet elements (an inner and an outer), and multiple elements will be shipped to H-Canyon for dissolution. Therefore, an evaluation has been performed to

determine whether or not multiple elements loaded into the same well can pose a criticality risk. First, the number of elements that can fit in a well was determined. Each element is 50.8 cm tall. The maximum height of solution in the wells is 162.433 cm (SRNS-H8100-2014-00075), based on the 10" limit. Therefore, only 3 elements could fit in each well and be submerged in solution, if the dissolver was filled to the 10" limit. Also, in reality, the solution height at a normal volume of 13,500 L is ~112 cm, and only 2 cores would be submerged in solution. A SCALE model was created with 3 inner elements in the small well and 3 outer elements in the large well, as shown in Figure 6 below. To simplify the input, no post was modeled.

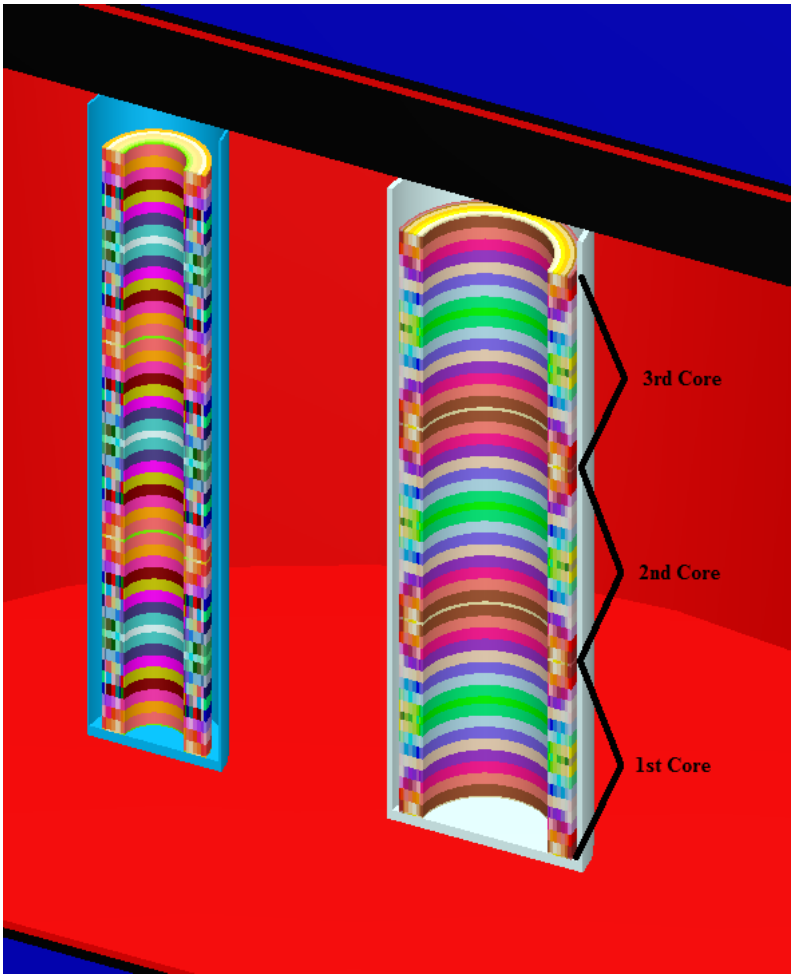

Figure 6 Over-Mass, 3 Cores

Since the results from the normal conditions show that the highest system multiplication (k_{eff}) occurs at Phase 0 (the beginning of dissolution), only this configuration was modeled. The results are given in Table 10 below.

Table 10 Over-Mass, 3 Cores Results

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_3CORES	0.866	0.0024	0.871

These results show that charging multiple cores to the dissolver is more reactive than only one core. However, it is still below the k_{safe} value of 0.96. This is reasonable since the elements are annular and are designed to be subcritical unless they are nested together and surrounded by a beryllium reflector. Each element is already approaching an infinite height, from a neutron's perspective, and adding more height does not significantly increase the system multiplication.

This analysis also shows that charging an element on top of a partially dissolved core will not cause a criticality. Therefore, probing to ensure complete dissolution is not a required criticality control.

Charging an element to the wrong well was also evaluated. The outer element will not fit in the inner well. However, the inner element will fit in the outer well. A SCALE model was developed that includes an inner element in the inner well, an outer element in the outer well, and another inner element in the outer well. This second inner element will rest on top of the post inside the outer well. However, in the SCALE model, the actual post material was not modeled, but the spacing provided by the post was modeled, as shown in Figure 7 below.

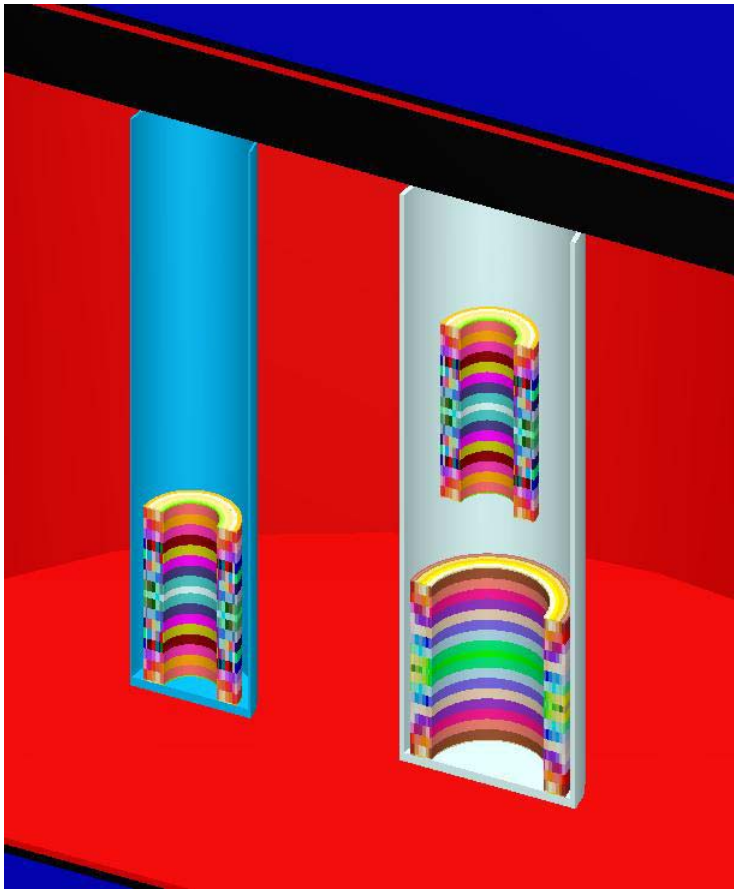

Figure 7 Over-Mass, 1.5 Cores

The results are given in Table 11 below.

Table 11 Over-Mass, 1.5 Cores Results

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_1.5CORES	0.851	0.0020	0.856

This configuration is below the k_{safe} value of 0.96. Therefore, charging an element to the wrong well does not cause a criticality.

The credibility of nesting inner and outer HFIR elements has also been evaluated. The HFIR elements are placed on aluminum carriers before being shipped to H-Canyon. The carriers are shown in Figure 8 and Figure 9. The carriers are credited as Safety Significant (SS) Design Features (DFs) in the L-Area NCSE, N-NCS-L-00130. The design of these carriers precludes the nesting of HFIR elements. The carrier design is documented in drawing C-CM-L-0016 for the outer element carrier and drawing C-CM-L-0017 for the inner element carrier. The inner diameter of the outer element carrier is 10.625". In order for the two elements to nest together, the outer diameter of the inner element must be less than the inner diameter of the outer element carrier, 10.625". Drawing E-42118 indicates that the outer diameter of the inner element is 11.741". Therefore the inner element will not fit inside the outer element carrier. Also, the bale of the inner carrier is 10.5" long and will also help prevent the carriers from nesting.

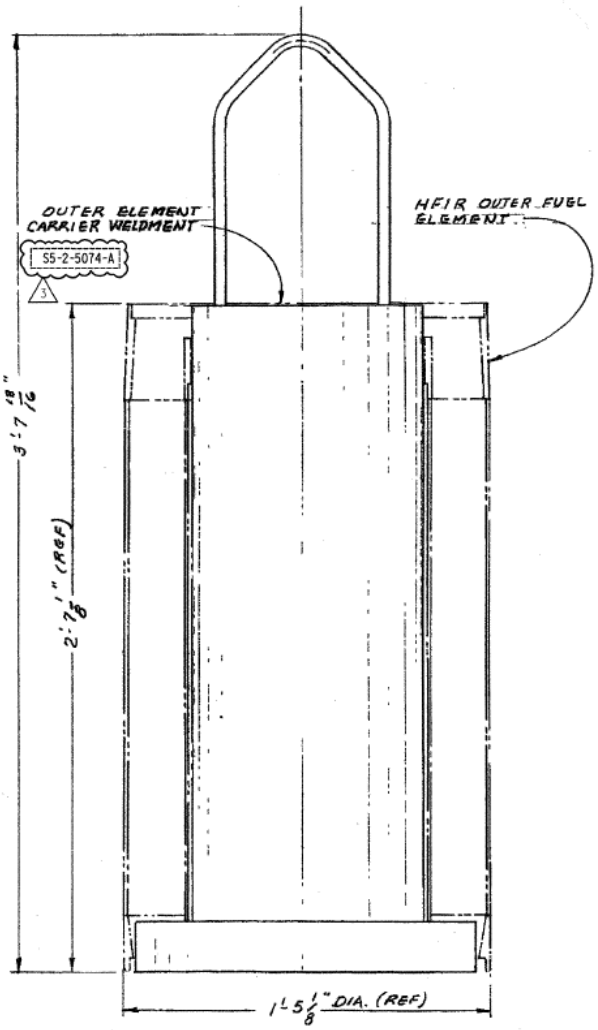

Figure 8 HFIR Outer Element Carrier (C-CM-L-0016)

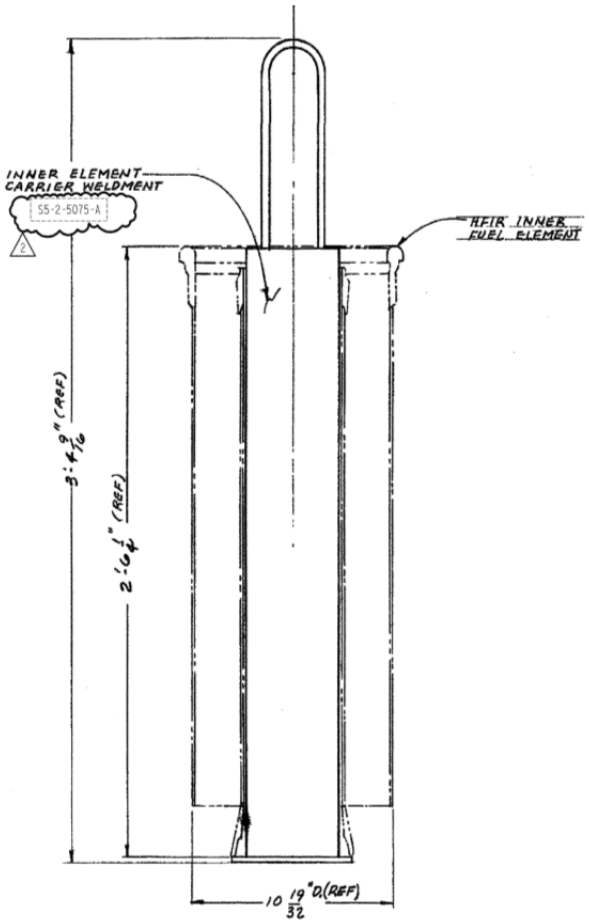

Figure 9 HFIR Inner Element Carrier (C-CM-L-0017)

However, the carriers will be dissolved as part of the HFIR dissolution process. This postulated event involves the inner element being placed in the outer well (1 mistake), and then the outer element is charged on top of it. The inner element will sit on top of the post and the outer element will sit on top of the inner element. If the two elements are lined up perfectly, and if there is a high enough liquid level to dissolve the bottom plate of the carrier that the outer element sits on, then the outer element could slide off the carrier and momentarily interact with the inner element before it slides to the bottom of the well.

There are several factors that make this event not credible. First, the crane operator has to put the inner element in the wrong well. It will be very obvious that there is much more clearance than there should be when the crane operator tries to put the inner element in the larger well. Second, there must be about 15,200 L of solution to have a high enough liquid level to dissolve the bottom part of the outer carrier. This is much higher than the normal expected volume of 13,500 L. Third, it is very unlikely that the two elements will be lined up perfectly. The outer element will be lined up because there's not much room in the well, but the inner element would likely be off to the side somewhat and not perfectly centered in the well. Fourth, the bottom plate of the outer carrier, which is pictured below, is 2.5" thick and protrudes 2.5" from the center post. That is a large mass

of aluminum that must dissolve, and it will take some time. During that time, the very thin aluminum sidewalls (~0.1" thick) and very thin fuel plates (~0.05" thick) should have significantly dissolved. Also, the bale on the inner element carrier must dissolve before the outer element can slide down around the inner element. Because of the amount of time required to dissolve the necessary aluminum, a significant portion of the inner element would be dissolved, and the k_{eff} will be much lower.

4.2 OVER-CONCENTRATION

During dissolution, the fissile concentration is limited by the amount of acid available. Once all the acid is consumed, the dissolution process stops and the fissile concentration cannot increase further. Calculations were performed to determine the maximum fissile concentration based on acid consumption. First, the amount of Al and ^{235}U must be calculated. Table 12 shows the amount of aluminum in the HFIR fuel elements. This data is based on the Appendix A Agreements.

Table 12 Aluminum Content

Inner Element	Outer Element
65.9 g Al as filler/plate	57.6 g Al as filler/plate
111.2 g Al as clad/plate	96.1 g Al as clad/plate
171 # of plates	369 # of plates
30,284.1 g Al in plates	**56,715.3** g Al in plates
1967 g Al in inner side plate	7024 g Al in inner side plate
7216 g Al in outer side plate	11706 g Al in outer side plate
448 g Al in top inner adapter	1491 g Al in top inner adapter
2168 g Al in top outer adapter	1722 g Al in top outer adapter
580 g Al in lower adapter	2114 g Al in lower adapter
42,663.1 g Al in inner element	**80,772.3** g Al in outer element
1,580.1 moles Al in inner element	**2,991.6** moles Al in outer element

Aluminum has 27 g/mole. This results in 4,571.7 total moles of Al in a HFIR core. As discussed previously, the inner element contains 2595.8 g ^{235}U, and the outer element contains 6804.4 g ^{235}U. ^{235}U has 235 g/mole. This results in 40.0 total moles of ^{235}U in a HFIR core. It is conservative to ignore all other elements and isotopes of uranium. In reality, moles of acid will be consumed by dissolving the other minor elements and isotopes and the real ^{235}U concentration will be lower than what is calculated here.

The total moles of acid available must also be calculated. Only 50% nitric acid is routed to the H-Canyon dissolvers. 50% nitric acid has a molarity of 10.351 M, and will be rounded up to 10.4 M for this analysis. Since 6.4D is larger than 6.1D and will allow for more moles of acid to be present, only 6.4D dimensions will be used for this analysis. It is assumed that 6.4D could be filled with 50% nitric acid up to the overflow. The 6.4D calibration chart, 221-H-TCC-6.4D, indicates that the 6.4D overflow is at 96.45” and 45,198 pounds. 45,198 pounds of water is equivalent to

20,507 kg (2.204 lb/kg), and assuming a density of 1.0 kg/L, this equates to a volume of 20,507 L. At 10.4 M acid and 20,507 L in 6.4D, there are a total of 213,275 moles of acid available.

The SRNL flowsheet for spent fuel dissolution, SRNL-STI-2010-00005, indicates that 3.75 moles of acid are consumed for every mole of Al and 4 moles of acid are consumed for every mole of U. To dissolve one HFIR core that contains 4,571.7 moles of Al and 40.0 moles of ^{235}U, 17,303.8 moles of acid would be consumed.

$$\left(4{,}571.7\ moles\ Al * 3.75 \frac{moles\ acid}{mole\ Al}\right) + \left(40.0\ moles\ U^{235} * 4 \frac{moles\ acid}{moles\ U^{235}}\right) = 17{,}303.8\ moles\ acid$$

If there are 213,275 moles of acid available, and it takes 17,303.8 to dissolve one HFIR core, then 12.33 cores (12.33 inner elements and 12.33 outer elements) could be dissolved before all the acid is consumed. Since there are 9400.2 g ^{235}U in each HFIR core, 12.33 cores, and an assume volume of 20,507 L, this results in a concentration of 5.65 g ^{235}U/L. The inner and outer elements have differing U:Al ratios and could result in a higher ^{235}U concentration if only outer elements are charged. However, it is expected that each batch will consist of an equal number of inner elements and outer elements.

Similar to how the normal condition cases were run, a series of cases were run that end at 5.65 g ^{235}U/L to ensure that an entire dissolution would be subcritical under acid consumption conditions. The results are given in Table 13.

Table 13 Acid Consumption Results

	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE00	0.805	0.0021	0.810
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE01	0.796	0.0018	0.800
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE02	0.776	0.0038	0.784
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE03	0.779	0.0020	0.783
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE04	0.750	0.0018	0.754
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE05	0.718	0.0013	0.721
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE06	0.660	0.0016	0.664
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE07	0.645	0.0005	0.646
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE08	0.644	0.0006	0.646
ORNL2_HFIR_DISSOLVING_ACID-CONSUMPTION_PU_PHASE09	0.646	0.0006	0.647

Figure 10 shows how k_{eff} changes over the dissolution process, ending with complete acid consumption.

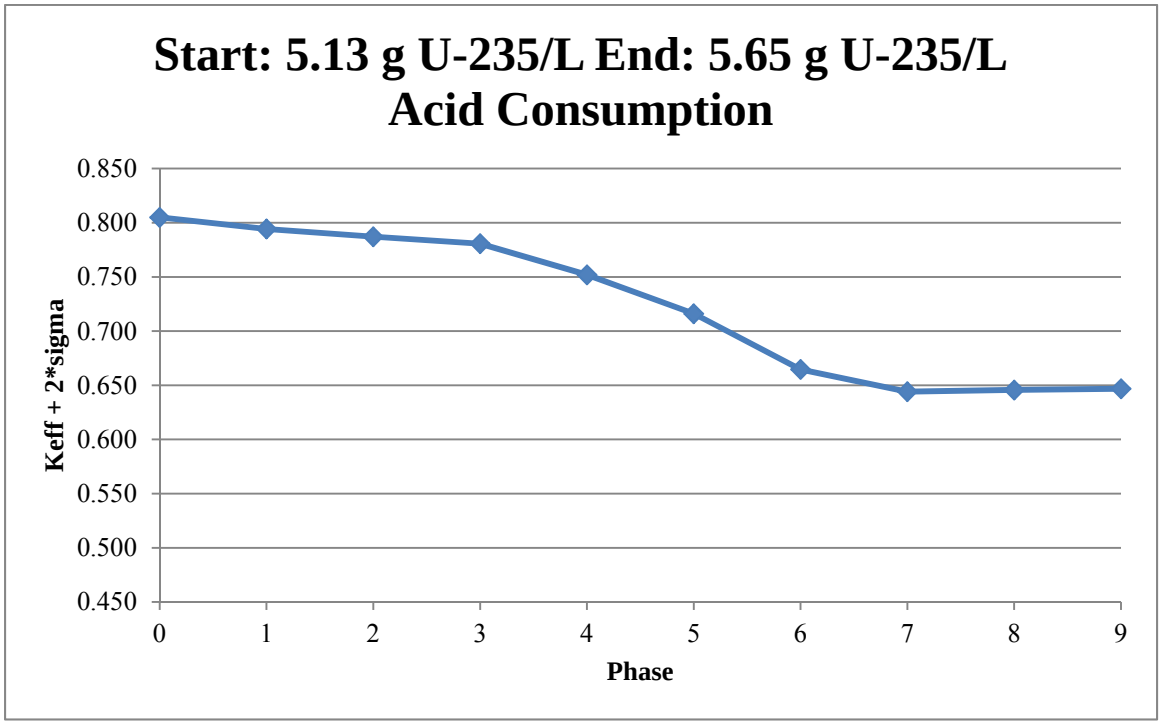

Figure 10 Acid Consumption Results

These results are higher than for the normal cases, however, all points are still below the k_{safe} value of 0.96, and the highest k_{eff} + 2*sigma value is 0.805. This indicates that it is not possible that an over-concentration caused by charging too many HFIR cores to the dissolver could result in a criticality because the chemistry limits the maximum fissile concentration.

Another potential cause for over-concentration is if the dissolver solution is allowed to evaporate due to steam heating. Several assumptions were made for this part of the analysis. They are listed below.

1. The facility does not operate tanks at a liquid level above the 10" limit, which is 10" below the overflow volume. For dissolvers, this means that the facility will not apply steam to the coils to begin dissolution if the liquid level is above the 10" limit. For tank 6.4D, the 10" limit is at 86.45". From the 6.4D calibration chart, this equates to 40,026 pounds. 40,026 pounds of water is equivalent to 18,152 kg (2.204 lb/kg), and assuming a density of 1.0 kg/L, this equates to a volume of 18,152 L.
2. The facility will not operate tanks with any steam coils uncovered. From the 6.4D calibration chart, the top coil (which is a steam coil) is covered at 51.08". This equates to 21,733 pounds. 21,733 pounds of water is equivalent to 9,856 kg (2.204 lb/kg), and assuming a density of 1.0 kg/L, this equates to a volume of 9,856 L.
3. The highest molarity nitric acid that is routed to the dissolver is 10.4 M (50% nitric acid). It is expected that 8-9 M acid will be used for HFIR dissolution.
4. The normal expected number of cores to be charged in a batch is 4 or 5.

5. The facility will not operate the dissolver without the condenser being functional and operating.
6. Once the dissolver is shut down, it falls under the evaluation and controls of the H-Canyon Double Contingency Analysis (DCA), N-NCS-H-00243. The controls for Event FS-5-001h will track, trend, and maintain liquid level above a value set to protect the concentration CSL that is specified in the DCA. The controls for Event DS-5-001 will ensure that two steam valves to the dissolver are closed and that the low level alarm is functional in order to prevent evaporation due to a steam valve leak-through.

In order to approach an unsafe fissile concentration, the following upsets would have to occur:

1. 6.4D is filled with 10.4 M (50%) nitric acid up to the 10" limit (18,152 L).
2. 11 HFIR cores are charged (11 inner elements and 11 outer elements) without transferring any solution out of the dissolver. This would consume all the acid available and would result in a concentration of 5.65 g ^{235}U/L. This would also be well beyond the aluminum solubility limit.
3. After the 11th core is dissolved, steam would have to be applied to the dissolver until the volume was at 8,918 L. This would result in a loss of 9,234 L, indicating that the condenser was not functional.
4. This would result in a concentration of 11.5 g ^{235}U/L, which is still subcritical.

Considering the assumptions listed above, a criticality due to over-concentrating the dissolver solution has been determined by a Hazards Analysis team to be not credible. This team consisted of representatives from engineering, operations, tech support, and criticality safety.

Therefore, no concentration controls or CSLs are needed to ensure the criticality safety of HFIR dissolution.

4.3 UNDISSOLVED SOLIDS

The accumulation of undissolved solids in the bottom of the dissolver was analyzed. It was assumed that a high-concentration hemisphere of 10% of the HFIR mass accumulates below each well. For example, beneath the large well, a hemisphere with 680.4 g ^{235}U and a radius of 23.8125 cm (same as the large well) is modeled. Simultaneously, beneath the small well, a hemisphere with 259.6 g ^{235}U and a radius of 16.3512 cm (same as the small well) is modeled, as shown in Figure 11 below.

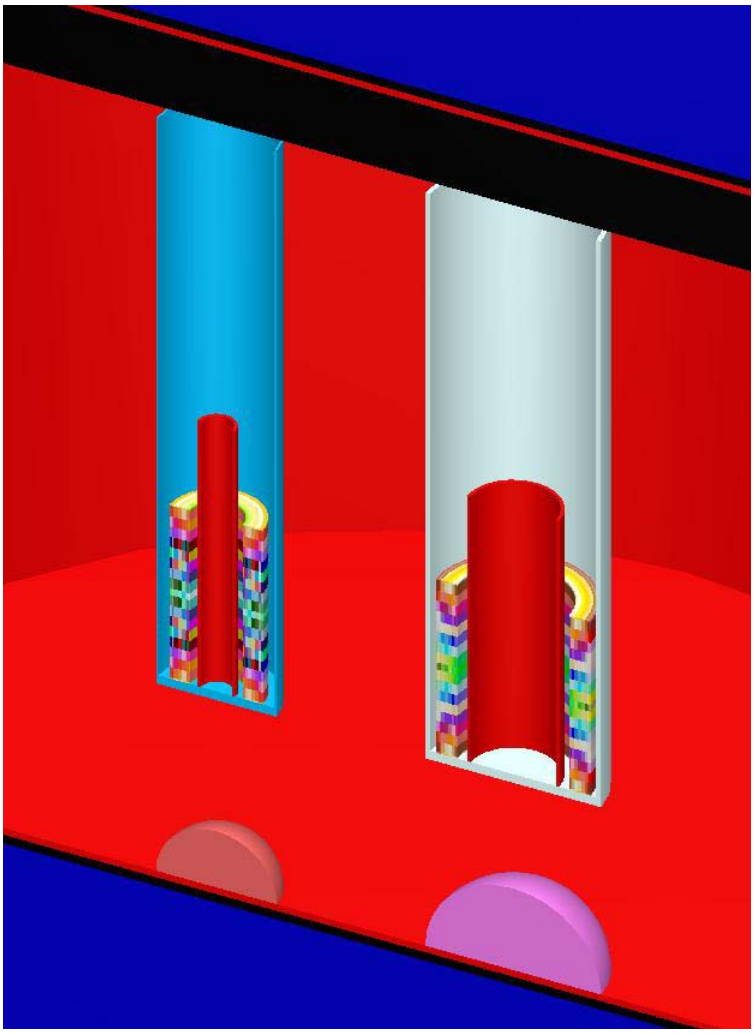

Figure 11 Undissolved Solids

The results are given in Table 14 below.

Table 14 Undissolved Solids Results

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_NORMAL_PU_HEMISPHERES_PHASE00	0.872	0.0014	0.875

This configuration is below the k_{safe} value of 0.96. Therefore, undissolved solids that collect on the bottom of the dissolver below the insert will not cause a criticality.

4.4 PU POLYMERIZATION

Future SRNL work may determine that Pu polymerization and precipitation is not credible for HFIR dissolving. However, without that determination, it should be assumed that Pu polymerization is a credible event. This event will require administrative controls with a PPL on a

minimum nitric acid molarity, similar to other dissolving NCSEs for H-Canyon. There is no CSL work required for this abnormal condition.

4.5 SENSITIVITY STUDIES

4.5.1 Corrosion

The HFIR Dimension Memo (SRNS-H8100-2014-00075) states that a bounding assumption should be made regarding the amount of corrosion and will be included in the models. Corrosion must be accounted for because steel acts as a neutron poison in a thermal neutron spectrum, such as the dissolver. As steel is corroded away, system multiplication is expected to increase. In order to bound any corrosion in the past or future, a SCALE case was run with no stainless steel modeled for the HFIR insert. The spacing provided by the insert is still modeled, but no stainless steel is modeled for the insert. The case with the highest system multiplication was chosen for this sensitivity study, and the stainless steel in the insert was removed. The input used was the 3 core input discuss in Section 4.1. Although the hemisphere case in Section 4.3 had a higher system multiplication, the higher k_{eff} was driven by the hemispheres in the bottom of the dissolver and not the material in the insert, and it was therefore not an appropriate case to choose for this sensitivity study.

The results of the corrosion sensitivity study are given in Table 15 below.

Table 15 Corrosion Sensitivity Study

Filename	k_{eff}	sigma	k_{eff} + 2*sigma
ORNL2_HFIR_DISSOLVING_3CORES_CORROSION	0.924	0.0017	0.927

When all the steel was removed from the HFIR insert, k_{eff} increased significantly. In the original case with stainless steel present, the k_{eff} + 2*sigma value was 0.871. When the stainless steel in the insert is removed, the k_{eff} + 2*sigma value is 0.927. However, this is still below the k_{safe} value of 0.96. Therefore, corrosion, including up to catastrophic failure, will not cause a potential criticality.

4.5.2 Insert Dimensions

The HFIR Dimension Memo (SRNS-H8100-2014-00075) also states that it is indeterminate whether the maximum or minimum value for the column height and the insert height will yield the most conservative result, and a sensitivity study should be performed to determine whether or not the model is sensitive to these dimensions. Table 16 below gives the range of values obtained from the reference drawings as documented in SRNS-H8100-2014-00075.

Table 16 Range of Column Height and Insert Height Dimensions

Column Height	
Nominal	164.000”
Max	164.149”

Min	163.673”
Insert Height	
Nominal*	252.6875”
Max	255.375”

*Also used as the minimum value since only two values were provided.

This range of values was carried through the calculations performed in the HFIR Dimension Memo to determine a maximum and minimum value for the distance from the bottom of the pot to the bottom of the insert and for the well solution height. These values are given in Table 17 below.

Table 17 Max and Min Values for Dimension Sensitivity Study

Distance from bottom of pot to bottom of insert			
	Nominal	Max	Min
6.4D	22.5”	22.649”	19.4855”
Well solution Height			
	Nominal	Max	Min
6.4D	63.95”	66.9645”	63.801”

Two base cases were chosen to examine whether or not the model is sensitive to these dimensions. The first case chosen was the normal case, Phase 0, with Pu. The second case chosen was the undissolved solids hemispheres case since changing these dimensions will affect how the material in the wells interacts with the potential hemispheres on the bottom of the dissolver. The results of this sensitivity study are given in

Table 18 Insert Dimension Sensitivity Study Results

Filename	k_{eff}	sigma	k_{eff} + 2*sigma	Delta from Nominal
ORNL2_HFIR_DISSOLVING_NORMAL_PU_HEMISPHERES_PHASE00_NOMINAL	0.872	0.0014	0.875	
ORNL2_HFIR_DISSOLVING_NORMAL_PU_HEMISPHERES_PHASE00_MAX	0.873	0.0013	0.876	0.0008
ORNL2_HFIR_DISSOLVING_NORMAL_PU_HEMISPHERES_PHASE00_MIN	0.871	0.0018	0.875	0.0001
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE00_NOMINAL	0.749	0.0014	0.752	
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE00_MAX	0.750	0.0019	0.754	0.0024
ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE00_MIN	0.754	0.0018	0.757	0.0057

In some cases, there is a statistically significant difference between the nominal case and the max or min case. However, the full range of possible dimensions has been examined, and all cases are still well below the k_{safe} value of 0.96. Therefore, variations in the dimensions of the HFIR insert within the range of analyzed values will not cause a potential criticality.

4.6 RECEIPT AND STORAGE

Potential receipt and handling events were considered for this evaluation. However, there are no credible criticality events due to receipt or handling. The potential receipt and handling events for H-Canyon are bounded by the analysis performed for L-Area in N-NCS-L-00130. The L-Area NCSE identifies the 70-ton cask HFIR insert and the HFIR aluminum carriers as SS DFs to prevent a criticality. H-Canyon does not have the ability to remove the HFIR insert from the 70-ton cask nor to remove the fuel elements from the aluminum carriers. Analysis in the L-Area NCSE shows that there are no potential criticality events due to dropping HFIR fuel elements, and the L-Area analysis bounds any potential configuration that could occur in H-Canyon.

The HFIR storage rack in Section 3H of H-Canyon can store 3 HFIR cores (3 inner elements and 3 outer elements) and provides more spacing between fuel elements than the 70-ton Cask insert. According to drawing S5-2-3621, Hot Canyon HFIR Processing Facilities Fuel Element Storage Rack Details, there is at least 2’ 3 1/8” center-to-center spacing between fuel elements. In several places, there is 3’ 4 3/8” center-to-center spacing between fuel elements. According to drawing S5-2-3509, HFIR Cask Insert 70 Ton Transfer Cask Arrangement and Details, there is only 1’ 7” center-to-center spacing. The L-Area NCSE, N-NCS-L-00130, analyzes HFIR fuel in the 70-ton cask utilizing the HFIR insert being subcritical, both flooded and dry, and the L-Area NCSE bounds any potential configuration that could occur in the H-Canyon HFIR storage rack.

Therefore, there are no CSLs required for the receipt, handling, or storage of HFIR fuel elements in H-Canyon. However, the HFIR rack is expected to be credited as an SS DF in the NCSE, when it is approved.

5.0 INPUTS AND ASSUMPTIONS

The following inputs and assumptions were used in this analysis and are described further in the applicable section. It has been determined that none of the following inputs or assumptions need to be protected with controls because it is either not possible to violate that assumption or bounding upsets involving that parameter have been shown to be safe.

5.1 PROCESS INPUTS AND ASSUMPTIONS

- The maximum nitric acid routed to the dissolver is 50% acid (10.4 M). (Section 4.2)
- 3.75 moles acid are consumed for every mole Al. (Section 4.2)
- 4.0 moles acid are consumed for every mole U. (Section 4.2)
- U and Al masses are given in the Appendix A documents. (Section 2.1)
- The facility will not operate the dissolver above the 10” limit. (Section 4.2)
- The facility will not operate the dissolver with any steam coils uncovered. (Section 4.2)
- The facility will not operate the dissolver without the condenser being functional and operating. (Section 4.2)
- A normal batch will consist of 5 or fewer HFIR cores. (Section 3.1)

- Events FS-5-001h and DS-5-001 from N-NCS-H-00243 will remain implemented. (Section 4.2)
- The HFIR insert is installed in the dissolver. (Section 2.4)
- The HFIR insert is installed in the 70-ton cask (Section 4.6)
- HFIR elements remain on the aluminum carriers during receipt, handling, and storage (Section 4.6)

5.2 MODELING INPUTS AND ASSUMPTIONS

- The holes go up the entire length of the well walls. (Section 2.4)
- Dimensions are given in the dimension memo (SRNS-H8100-2014-00075). (Section 2.4)
- No credit is taken for boron in the inner fuel element or in the insert stainless steel. (Section 2.3)
- Fuel is modeled at beginning of life ^{235}U masses and enrichment. (Section 2.2)
- The ORNL HFIR model is used for the fuel regions. (Section 2.1)
- ^{235}U in solution is modeled at 95 wt. % ^{235}U and 5 wt. % ^{238}U. (Section 2.2)
- Plutonium is modeled at 95 wt. % ^{239}Pu and 5 wt. % ^{240}Pu. (Section 2.2)
- For additional U and Pu in the fuel regions due to the fissile/acid solution in the cooling channels, it is assumed that the entire volume of that fuel region has the maximum atom density of the additional U & Pu. (Section 3.0)

6.0 CONCLUSION

In conclusion, the safety of HFIR dissolution in H-Canyon has been evaluated. Due to the composition and geometry of the HFIR elements and the chemistry of the dissolution process, there are no credible criticality events associated with HFIR dissolution, with the exception of potential Pu polymerization. There are no mass, concentration, or soluble poison CSLs required for HFIR dissolution in H-Canyon. Storage of dissolved HFIR solution is adequately addressed in the H-Canyon DCA, N-NCS-H-00243.

Furthermore, no credit was taken for the boron in the stainless steel posts in the HFIR insert, and no blackness testing of the insert is required for criticality safety.

7.0 REFERENCES

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ANSI/ANS-8.1-1998, *Nuclear Criticality Safety in Operations with Fissionable Material Outside Reactors*, American National Standards Institute / American Nuclear Society, La Grange Park, IL.

C-CM-L-0016, Rev. 3, Building 105-L Outer Element Carrier Weldment and Arrangement

C-CM-L-0017, Rev. 2, Building 105-L Inner Element Carrier Weldment and Arrangement

DOESRAAD-10-095.1, Rev. 2, HFIR Appendix A Agreement

DOESRAAD-10-095.2, Rev. 2, HFIR Appendix A Agreement

DOESRAAD-03-051.1, Rev. 0, HFIR Appendix A Agreement

DOESRAAD-03-051.2, Rev. 0, HFIR Appendix A Agreement

E-42118, Rev. P, HFIR Inner Fuel Element Assembly

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ATTACHMENT 2 - SCALE 5/KENO VI SAMPLE INPUT

This sample input is for the case ORNL2_HFIR_DISSOLVING_NORMAL_PU_PHASE00.

```
#csas26   parm=centrm
ORNL2 model, starting concentration 2.94 g U/L, 0.25 g Pu/L, Phase 0
'approved dimensions
'only H, O, Al, and U isotopes
238group               infhommedium
'****** Regulatory Concrete  ****************************************
reg-concrete   2  1.0 300 end
'****** Pot Solution, 0 M  ******************************************
solnuo2(no3)2  4  2.94 0.0 1.000 300 92235 95 92238 5 end
Pu-239         4  0  5.98421E-07 300 end
Pu-240         4  0  3.13646E-08 300 end
'******* Soild Stainless Steel ***************************************
ss304          6  1.0 300 end
'****** Insert Wall Blend - Inner Well *******************************
'Assume a hole volume fraction of 0.15 at bulk concentration
ss304          10  0.85 300 end
solnuo2(no3)2  10  2.94 0.0 0.15 300 92235 95 92238 5 end
Pu-239         10  0  8.97631E-08 300 end
Pu-240         10  0  4.70469E-09 300 end
'****** Insert Wall Blend - Outer Well *******************************
'Assume a hole volume fraction of 0.15 at bulk concentration
ss304          11  0.85 300 end
solnuo2(no3)2  11  2.94 0.0 0.15 300 92235 95 92238 5 end
Pu-239         11  0  8.97631E-08 300 end
Pu-240         11  0  4.70469E-09 300 end
' ============================================================
' |                                          |
' |                  IFE                     |
' |                                          |
' ============================================================
'       Inner fuel element--fueled Axial region 1
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1           211   0   3.32434E-02   293.6   end
' B-10          211   0   2.04121E-05   293.6   end
' B-11          211   0   8.26896E-05   293.6   end
 O-16          211   0   1.71757E-02   293.6   end
'Mg-24          211   0   1.05686E-04   293.6   end
'Mg-25          211   0   1.33797E-05   293.6   end
'Mg-26          211   0   1.47310E-05   293.6   end
Al-27          211   0   2.89993E-02   293.6   end
'Si-28          211   0   1.02644E-04   293.6   end
'Si-29          211   0   5.19729E-06   293.6   end
'Si-30          211   0   3.45002E-06   293.6   end
'Ti-46          211   0   4.20262E-07   293.6   end
'Ti-47          211   0   3.79000E-07   293.6   end
'Ti-48          211   0   3.75536E-06   293.6   end
'Ti-49          211   0   2.75590E-07   293.6   end
'Ti-50          211   0   2.63873E-07   293.6   end
'Cr-50          211   0   5.30517E-07   293.6   end
'Cr-52          211   0   1.02189E-05   293.6   end
'Cr-53          211   0   1.15860E-06   293.6   end
'Cr-54          211   0   2.87821E-07   293.6   end
'Mn-55          211   0   6.57731E-06   293.6   end
'Fe-54          211   0   2.42259E-06   293.6   end
'Fe-56          211   0   3.79953E-05   293.6   end
'Fe-57          211   0   8.77930E-07   293.6   end
'Fe-58          211   0   1.15953E-07   293.6   end
 U-234          211   0   2.20708E-06   293.6   end
 U-235          211   0   2.20178E-04   293.6   end
 U-236          211   0   8.82838E-07   293.6   end
 U-238          211   0   1.19182E-05   293.6   end
 Pu-239         211  0  5.98421E-07 300 end
 Pu-240         211  0  3.13646E-08 300 end
'      total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1           212   0   3.32434E-02   293.6   end
' B-10          212   0   1.77513E-05   293.6   end
' B-11          212   0   7.19107E-05   293.6   end
 O-16          212   0   1.73053E-02   293.6   end
'Mg-24          212   0   1.05686E-04   293.6   end
'Mg-25          212   0   1.33797E-05   293.6   end
'Mg-26          212   0   1.47310E-05   293.6   end
Al-27          212   0   2.88388E-02   293.6   end
'Si-28          212   0   1.02285E-04   293.6   end
'Si-29          212   0   5.17912E-06   293.6   end
'Si-30          212   0   3.43796E-06   293.6   end
'Ti-46          212   0   4.20262E-07   293.6   end
'Ti-47          212   0   3.79000E-07   293.6   end
'Ti-48          212   0   3.75536E-06   293.6   end
'Ti-49          212   0   2.75590E-07   293.6   end
'Ti-50          212   0   2.63873E-07   293.6   end
'Cr-50          212   0   5.30517E-07   293.6   end
'Cr-52          212   0   1.02189E-05   293.6   end
'Cr-53          212   0   1.15860E-06   293.6   end
'Cr-54          212   0   2.87821E-07   293.6   end
'Mn-55          212   0   6.55746E-06   293.6   end
'Fe-54          212   0   2.41117E-06   293.6   end
'Fe-56          212   0   3.78162E-05   293.6   end
'Fe-57          212   0   8.73792E-07   293.6   end
'Fe-58          212   0   1.15406E-07   293.6   end
 U-234          212   0   2.69313E-06   293.6   end
 U-235          212   0   2.65478E-04   293.6   end
 U-236          212   0   1.07726E-06   293.6   end
 U-238          212   0   1.45429E-05   293.6   end
 Pu-239         212  0  5.98421E-07 300 end
Pu-240         212  0  3.13646E-08 300 end
'      total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1           213   0   3.32435E-02   293.6   end
' B-10          213   0   1.46911E-05   293.6   end
' B-11          213   0   5.95139E-05   293.6   end
 O-16          213   0   1.74543E-02   293.6   end
'Mg-24          213   0   1.05686E-04   293.6   end
'Mg-25          213   0   1.33797E-05   293.6   end
'Mg-26          213   0   1.47310E-05   293.6   end
Al-27          213   0   2.86541E-02   293.6   end
'Si-28          213   0   1.01874E-04   293.6   end
'Si-29          213   0   5.15831E-06   293.6   end
'Si-30          213   0   3.42415E-06   293.6   end
'Ti-46          213   0   4.20263E-07   293.6   end
'Ti-47          213   0   3.79001E-07   293.6   end
'Ti-48          213   0   3.75537E-06   293.6   end
'Ti-49          213   0   2.75590E-07   293.6   end
'Ti-50          213   0   2.63873E-07   293.6   end
'Cr-50          213   0   5.30518E-07   293.6   end
'Cr-52          213   0   1.02189E-05   293.6   end
'Cr-53          213   0   1.15860E-06   293.6   end
'Cr-54          213   0   2.87821E-07   293.6   end
'Mn-55          213   0   6.53464E-06   293.6   end
'Fe-54          213   0   2.39803E-06   293.6   end
'Fe-56          213   0   3.76103E-05   293.6   end
'Fe-57          213   0   8.69031E-07   293.6   end
'Fe-58          213   0   1.14778E-07   293.6   end
 U-234          213   0   3.25215E-06   293.6   end
 U-235          213   0   3.17578E-04   293.6   end
 U-236          213   0   1.30087E-06   293.6   end
 U-238          213   0   1.75616E-05   293.6   end
 Pu-239         213  0  5.98421E-07 300 end
Pu-240         213  0  3.13646E-08 300 end
'      total atom density =  8.00937E-02 a/b-cm
'   8.009370E-02
 H-1           214   0   3.32434E-02   293.6   end
' B-10          214   0   1.03798E-05   293.6   end
' B-11          214   0   4.20486E-05   293.6   end
 O-16          214   0   1.76644E-02   293.6   end
'Mg-24          214   0   1.05686E-04   293.6   end
'Mg-25          214   0   1.33797E-05   293.6   end
'Mg-26          214   0   1.47310E-05   293.6   end
Al-27          214   0   2.83940E-02   293.6   end
'Si-28          214   0   1.01293E-04   293.6   end
'Si-29          214   0   5.12887E-06   293.6   end
'Si-30          214   0   3.40461E-06   293.6   end
'Ti-46          214   0   4.20262E-07   293.6   end
'Ti-47          214   0   3.79000E-07   293.6   end
'Ti-48          214   0   3.75536E-06   293.6   end
'Ti-49          214   0   2.75590E-07   293.6   end
'Ti-50          214   0   2.63873E-07   293.6   end
'Cr-50          214   0   5.30517E-07   293.6   end
'Cr-52          214   0   1.02189E-05   293.6   end
'Cr-53          214   0   1.15860E-06   293.6   end
'Cr-54          214   0   2.87821E-07   293.6   end
'Mn-55          214   0   6.50246E-06   293.6   end
'Fe-54          214   0   2.37952E-06   293.6   end
'Fe-56          214   0   3.73198E-05   293.6   end
'Fe-57          214   0   8.62321E-07   293.6   end
'Fe-58          214   0   1.13891E-07   293.6   end
 U-234          214   0   4.03970E-06   293.6   end
 U-235          214   0   3.90978E-04   293.6   end
 U-236          214   0   1.61589E-06   293.6   end
 U-238          214   0   2.18144E-05   293.6   end
 Pu-239         214  0  5.98421E-07 300 end
Pu-240         214  0  3.13646E-08 300 end
'      total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1           215   0   3.32434E-02   293.6   end
```

```
' B-10        215   0  6.18010E-06  293.6  end
' B-11        215   0  2.50356E-05  293.6  end
 O-16         215   0  1.78689E-02  293.6  end
'Mg-24        215   0  1.05686E-04  293.6  end
'Mg-25        215   0  1.33797E-05  293.6  end
'Mg-26        215   0  1.47310E-05  293.6  end
Al-27         215   0  2.81406E-02  293.6  end
'Si-28        215   0  1.00727E-04  293.6  end
'Si-29        215   0  5.10026E-06  293.6  end
'Si-30        215   0  3.38560E-06  293.6  end
'Ti-46        215   0  4.20262E-07  293.6  end
'Ti-47        215   0  3.79000E-07  293.6  end
'Ti-48        215   0  3.75536E-06  293.6  end
'Ti-49        215   0  2.75590E-07  293.6  end
'Ti-50        215   0  2.63873E-07  293.6  end
'Cr-50        215   0  5.30518E-07  293.6  end
'Cr-52        215   0  1.02189E-05  293.6  end
'Cr-53        215   0  1.15860E-06  293.6  end
'Cr-54        215   0  2.87821E-07  293.6  end
'Mn-55        215   0  6.47114E-06  293.6  end
'Fe-54        215   0  2.36149E-06  293.6  end
'Fe-56        215   0  3.70370E-05  293.6  end
'Fe-57        215   0  8.55788E-07  293.6  end
'Fe-58        215   0  1.13028E-07  293.6  end
 U-234        215   0  4.80687E-06  293.6  end
 U-235        215   0  4.62478E-04  293.6  end
 U-236        215   0  1.92276E-06  293.6  end
 U-238        215   0  2.59571E-05  293.6  end
 Pu-239       215  0  5.98421E-07 300 end
Pu-240        215  0  3.13646E-08 300 end
'       total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1          216   0  3.32434E-02  293.6  end
' B-10        216   0  5.79830E-06  293.6  end
' B-11        216   0  2.34889E-05  293.6  end
 O-16         216   0  1.78875E-02  293.6  end
'Mg-24        216   0  1.05686E-04  293.6  end
'Mg-25        216   0  1.33797E-05  293.6  end
'Mg-26        216   0  1.47310E-05  293.6  end
Al-27         216   0  2.81176E-02  293.6  end
'Si-28        216   0  1.00676E-04  293.6  end
'Si-29        216   0  5.09768E-06  293.6  end
'Si-30        216   0  3.38390E-06  293.6  end
'Ti-46        216   0  4.20262E-07  293.6  end
'Ti-47        216   0  3.79000E-07  293.6  end
'Ti-48        216   0  3.75536E-06  293.6  end
'Ti-49        216   0  2.75590E-07  293.6  end
'Ti-50        216   0  2.63873E-07  293.6  end
'Cr-50        216   0  5.30517E-07  293.6  end
'Cr-52        216   0  1.02189E-05  293.6  end
'Cr-53        216   0  1.15860E-06  293.6  end
'Cr-54        216   0  2.87821E-07  293.6  end
'Mn-55        216   0  6.46828E-06  293.6  end
'Fe-54        216   0  2.35985E-06  293.6  end
'Fe-56        216   0  3.70113E-05  293.6  end
'Fe-57        216   0  8.55193E-07  293.6  end
'Fe-58        216   0  1.12950E-07  293.6  end
 U-234        216   0  4.87661E-06  293.6  end
 U-235        216   0  4.68978E-04  293.6  end
 U-236        216   0  1.95066E-06  293.6  end
 U-238        216   0  2.63337E-05  293.6  end
 Pu-239       216  0  5.98421E-07 300 end
Pu-240        216  0  3.13646E-08 300 end
'       total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1          217   0  3.32434E-02  293.6  end
' B-10        217   0  7.99507E-06  293.6  end
' B-11        217   0  3.23880E-05  293.6  end
 O-16         217   0  1.77805E-02  293.6  end
'Mg-24        217   0  1.05686E-04  293.6  end
'Mg-25        217   0  1.33797E-05  293.6  end
'Mg-26        217   0  1.47310E-05  293.6  end
Al-27         217   0  2.82501E-02  293.6  end
'Si-28        217   0  1.00972E-04  293.6  end
'Si-29        217   0  5.11262E-06  293.6  end
'Si-30        217   0  3.39382E-06  293.6  end
'Ti-46        217   0  4.20262E-07  293.6  end
'Ti-47        217   0  3.79000E-07  293.6  end
'Ti-48        217   0  3.75536E-06  293.6  end
'Ti-49        217   0  2.75590E-07  293.6  end
'Ti-50        217   0  2.63873E-07  293.6  end
'Cr-50        217   0  5.30517E-07  293.6  end
'Cr-52        217   0  1.02189E-05  293.6  end
'Cr-53        217   0  1.15860E-06  293.6  end
'Cr-54        217   0  2.87821E-07  293.6  end
'Mn-55        217   0  6.48467E-06  293.6  end
'Fe-54        217   0  2.36928E-06  293.6  end
'Fe-56        217   0  3.71592E-05  293.6  end
'Fe-57        217   0  8.58611E-07  293.6  end
'Fe-58        217   0  1.13401E-07  293.6  end
 U-234        217   0  4.47532E-06  293.6  end
 U-235        217   0  4.31578E-04  293.6  end
 U-236        217   0  1.79014E-06  293.6  end
 U-238        217   0  2.41667E-05  293.6  end
 Pu-239       217  0  5.98421E-07 300 end
Pu-240        217  0  3.13646E-08 300 end
'       total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1          218   0  3.32434E-02  293.6  end
' B-10        218   0  1.06559E-05  293.6  end
' B-11        218   0  4.31670E-05  293.6  end
 O-16         218   0  1.76509E-02  293.6  end
'Mg-24        218   0  1.05686E-04  293.6  end
'Mg-25        218   0  1.33797E-05  293.6  end
'Mg-26        218   0  1.47310E-05  293.6  end
Al-27         218   0  2.84107E-02  293.6  end
'Si-28        218   0  1.01330E-04  293.6  end
'Si-29        218   0  5.13079E-06  293.6  end
'Si-30        218   0  3.40588E-06  293.6  end
'Ti-46        218   0  4.20262E-07  293.6  end
'Ti-47        218   0  3.79000E-07  293.6  end
'Ti-48        218   0  3.75536E-06  293.6  end
'Ti-49        218   0  2.75590E-07  293.6  end
'Ti-50        218   0  2.63873E-07  293.6  end
'Cr-50        218   0  5.30517E-07  293.6  end
'Cr-52        218   0  1.02189E-05  293.6  end
'Cr-53        218   0  1.15860E-06  293.6  end
'Cr-54        218   0  2.87821E-07  293.6  end
'Mn-55        218   0  6.50452E-06  293.6  end
'Fe-54        218   0  2.38070E-06  293.6  end
'Fe-56        218   0  3.73384E-05  293.6  end
'Fe-57        218   0  8.62751E-07  293.6  end
'Fe-58        218   0  1.13948E-07  293.6  end
 U-234        218   0  3.98927E-06  293.6  end
 U-235        218   0  3.86278E-04  293.6  end
 U-236        218   0  1.59572E-06  293.6  end
 U-238        218   0  2.15420E-05  293.6  end
 Pu-239       218  0  5.98421E-07 300 end
Pu-240        218  0  3.13646E-08 300 end
'
'       Inner fuel element--fueled Axial region 2
'       total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1          221   0  3.32434E-02  293.6  end
' B-10        221   0  2.04121E-05  293.6  end
' B-11        221   0  8.26896E-05  293.6  end
 O-16         221   0  1.71757E-02  293.6  end
'Mg-24        221   0  1.05686E-04  293.6  end
'Mg-25        221   0  1.33797E-05  293.6  end
'Mg-26        221   0  1.47310E-05  293.6  end
Al-27         221   0  2.89993E-02  293.6  end
'Si-28        221   0  1.02644E-04  293.6  end
'Si-29        221   0  5.19729E-06  293.6  end
'Si-30        221   0  3.45002E-06  293.6  end
'Ti-46        221   0  4.20262E-07  293.6  end
'Ti-47        221   0  3.79000E-07  293.6  end
'Ti-48        221   0  3.75536E-06  293.6  end
'Ti-49        221   0  2.75590E-07  293.6  end
'Ti-50        221   0  2.63873E-07  293.6  end
'Cr-50        221   0  5.30517E-07  293.6  end
'Cr-52        221   0  1.02189E-05  293.6  end
'Cr-53        221   0  1.15860E-06  293.6  end
'Cr-54        221   0  2.87821E-07  293.6  end
'Mn-55        221   0  6.57731E-06  293.6  end
'Fe-54        221   0  2.42259E-06  293.6  end
'Fe-56        221   0  3.79953E-05  293.6  end
'Fe-57        221   0  8.77930E-07  293.6  end
'Fe-58        221   0  1.15953E-07  293.6  end
 U-234        221   0  2.20708E-06  293.6  end
 U-235        221   0  2.20178E-04  293.6  end
 U-236        221   0  8.82838E-07  293.6  end
 U-238        221   0  1.19182E-05  293.6  end
 Pu-239       221  0  5.98421E-07 300 end
Pu-240        221  0  3.13646E-08 300 end
'       total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1          222   0  3.32434E-02  293.6  end
' B-10        222   0  1.77513E-05  293.6  end
' B-11        222   0  7.19107E-05  293.6  end
 O-16         222   0  1.73053E-02  293.6  end
'Mg-24        222   0  1.05686E-04  293.6  end
'Mg-25        222   0  1.33797E-05  293.6  end
'Mg-26        222   0  1.47310E-05  293.6  end
Al-27         222   0  2.88388E-02  293.6  end
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'Ti-47        222   0  3.79000E-07  293.6  end
'Ti-48        222   0  3.75536E-06  293.6  end
'Ti-49        222   0  2.75590E-07  293.6  end
'Ti-50        222   0  2.63873E-07  293.6  end
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'Cr-50 222 0 5.30517E-07 293.6 end
'Cr-52 222 0 1.02189E-05 293.6 end
'Cr-53 222 0 1.15860E-06 293.6 end
'Cr-54 222 0 2.87821E-07 293.6 end
'Mn-55 222 0 6.55746E-06 293.6 end
'Fe-54 222 0 2.41117E-06 293.6 end
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U-235 222 0 2.65478E-04 293.6 end
U-236 222 0 1.07726E-06 293.6 end
U-238 222 0 1.45429E-05 293.6 end
Pu-239 222 0 5.98421E-07 300 end
Pu-240 222 0 3.13646E-08 300 end
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' B-11 223 0 5.95139E-05 293.6 end
O-16 223 0 1.74543E-02 293.6 end
'Mg-24 223 0 1.05686E-04 293.6 end
'Mg-25 223 0 1.33797E-05 293.6 end
'Mg-26 223 0 1.47310E-05 293.6 end
Al-27 223 0 2.86541E-02 293.6 end
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'Si-29 223 0 5.15831E-06 293.6 end
'Si-30 223 0 3.42415E-06 293.6 end
'Ti-46 223 0 4.20263E-07 293.6 end
'Ti-47 223 0 3.79001E-07 293.6 end
'Ti-48 223 0 3.75537E-06 293.6 end
'Ti-49 223 0 2.75590E-07 293.6 end
'Ti-50 223 0 2.63873E-07 293.6 end
'Cr-50 223 0 5.30518E-07 293.6 end
'Cr-52 223 0 1.02189E-05 293.6 end
'Cr-53 223 0 1.15860E-06 293.6 end
'Cr-54 223 0 2.87821E-07 293.6 end
'Mn-55 223 0 6.53464E-06 293.6 end
'Fe-54 223 0 2.39803E-06 293.6 end
'Fe-56 223 0 3.76103E-05 293.6 end
'Fe-57 223 0 8.69031E-07 293.6 end
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U-235 223 0 3.17578E-04 293.6 end
U-236 223 0 1.30087E-06 293.6 end
U-238 223 0 1.75616E-05 293.6 end
Pu-239 223 0 5.98421E-07 300 end
Pu-240 223 0 3.13646E-08 300 end
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' 8.009370E-02
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' B-10 224 0 1.03798E-05 293.6 end
' B-11 224 0 4.20486E-05 293.6 end
O-16 224 0 1.76644E-02 293.6 end
'Mg-24 224 0 1.05686E-04 293.6 end
'Mg-25 224 0 1.33797E-05 293.6 end
'Mg-26 224 0 1.47310E-05 293.6 end
Al-27 224 0 2.83940E-02 293.6 end
'Si-28 224 0 1.01293E-04 293.6 end
'Si-29 224 0 5.12887E-06 293.6 end
'Si-30 224 0 3.40461E-06 293.6 end
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'Ti-47 224 0 3.79000E-07 293.6 end
'Ti-48 224 0 3.75536E-06 293.6 end
'Ti-49 224 0 2.75590E-07 293.6 end
'Ti-50 224 0 2.63873E-07 293.6 end
'Cr-50 224 0 5.30517E-07 293.6 end
'Cr-52 224 0 1.02189E-05 293.6 end
'Cr-53 224 0 1.15860E-06 293.6 end
'Cr-54 224 0 2.87821E-07 293.6 end
'Mn-55 224 0 6.50246E-06 293.6 end
'Fe-54 224 0 2.37952E-06 293.6 end
'Fe-56 224 0 3.73198E-05 293.6 end
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'Fe-58 224 0 1.13891E-07 293.6 end
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Pu-239 224 0 5.98421E-07 300 end
Pu-240 224 0 3.13646E-08 300 end
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' B-11 225 0 2.50356E-05 293.6 end
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'Mg-26 225 0 1.47310E-05 293.6 end
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'Si-29 225 0 5.10026E-06 293.6 end
'Si-30 225 0 3.38560E-06 293.6 end
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'Ti-47 225 0 3.79000E-07 293.6 end
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'Ti-49 225 0 2.75590E-07 293.6 end
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'Cr-53 225 0 1.15860E-06 293.6 end
'Cr-54 225 0 2.87821E-07 293.6 end
'Mn-55 225 0 6.47114E-06 293.6 end
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'Fe-56 225 0 3.70370E-05 293.6 end
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'Fe-58 225 0 1.13028E-07 293.6 end
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U-236 225 0 1.92276E-06 293.6 end
U-238 225 0 2.59571E-05 293.6 end
Pu-239 225 0 5.98421E-07 300 end
Pu-240 225 0 3.13646E-08 300 end
' total atom density = 8.00998E-02 a/b-cm
' 8.009980E-02
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' B-10 226 0 5.79830E-06 293.6 end
' B-11 226 0 2.34889E-05 293.6 end
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'Mg-26 226 0 1.47310E-05 293.6 end
Al-27 226 0 2.81176E-02 293.6 end
'Si-28 226 0 1.00676E-04 293.6 end
'Si-29 226 0 5.09768E-06 293.6 end
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'Ti-46 226 0 4.20262E-07 293.6 end
'Ti-47 226 0 3.79000E-07 293.6 end
'Ti-48 226 0 3.75536E-06 293.6 end
'Ti-49 226 0 2.75590E-07 293.6 end
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'Fe-57 226 0 8.55193E-07 293.6 end
'Fe-58 226 0 1.12950E-07 293.6 end
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U-235 226 0 4.68978E-04 293.6 end
U-236 226 0 1.95066E-06 293.6 end
U-238 226 0 2.63337E-05 293.6 end
Pu-239 226 0 5.98421E-07 300 end
Pu-240 226 0 3.13646E-08 300 end
' total atom density = 8.00968E-02 a/b-cm
' 8.009680E-02
H-1 227 0 3.32434E-02 293.6 end
' B-10 227 0 7.99507E-06 293.6 end
' B-11 227 0 3.23880E-05 293.6 end
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'Mg-24 227 0 1.05686E-04 293.6 end
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'Mg-26 227 0 1.47310E-05 293.6 end
Al-27 227 0 2.82501E-02 293.6 end
'Si-28 227 0 1.00972E-04 293.6 end
'Si-29 227 0 5.11262E-06 293.6 end
'Si-30 227 0 3.39382E-06 293.6 end
'Ti-46 227 0 4.20262E-07 293.6 end
'Ti-47 227 0 3.79000E-07 293.6 end
'Ti-48 227 0 3.75536E-06 293.6 end
'Ti-49 227 0 2.75590E-07 293.6 end
'Ti-50 227 0 2.63873E-07 293.6 end
'Cr-50 227 0 5.30517E-07 293.6 end
'Cr-52 227 0 1.02189E-05 293.6 end
'Cr-53 227 0 1.15860E-06 293.6 end
'Cr-54 227 0 2.87821E-07 293.6 end
'Mn-55 227 0 6.48467E-06 293.6 end
'Fe-54 227 0 2.36928E-06 293.6 end
'Fe-56 227 0 3.71592E-05 293.6 end
'Fe-57 227 0 8.58611E-07 293.6 end
'Fe-58 227 0 1.13401E-07 293.6 end
U-234 227 0 4.47532E-06 293.6 end
U-235 227 0 4.31578E-04 293.6 end
U-236 227 0 1.79014E-06 293.6 end
U-238 227 0 2.41667E-05 293.6 end
Pu-239 227 0 5.98421E-07 300 end
Pu-240 227 0 3.13646E-08 300 end
' total atom density = 8.00933E-02 a/b-cm
' 8.009330E-02

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' B-10        228    0   1.06559E-05   293.6   end
' B-11        228    0   4.31670E-05   293.6   end
 O-16         228    0   1.76509E-02   293.6   end
'Mg-24        228    0   1.05686E-04   293.6   end
'Mg-25        228    0   1.33797E-05   293.6   end
'Mg-26        228    0   1.47310E-05   293.6   end
Al-27         228    0   2.84107E-02   293.6   end
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'Si-29        228    0   5.13079E-06   293.6   end
'Si-30        228    0   3.40588E-06   293.6   end
'Ti-46        228    0   4.20262E-07   293.6   end
'Ti-47        228    0   3.79000E-07   293.6   end
'Ti-48        228    0   3.75536E-06   293.6   end
'Ti-49        228    0   2.75590E-07   293.6   end
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'Cr-50        228    0   5.30517E-07   293.6   end
'Cr-52        228    0   1.02189E-05   293.6   end
'Cr-53        228    0   1.15860E-06   293.6   end
'Cr-54        228    0   2.87821E-07   293.6   end
'Mn-55        228    0   6.50452E-06   293.6   end
'Fe-54        228    0   2.38070E-06   293.6   end
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'Fe-57        228    0   8.62751E-07   293.6   end
'Fe-58        228    0   1.13948E-07   293.6   end
 U-234        228    0   3.98927E-06   293.6   end
 U-235        228    0   3.86278E-04   293.6   end
 U-236        228    0   1.59572E-06   293.6   end
 U-238        228    0   2.15420E-05   293.6   end
 Pu-239       228  0  5.98421E-07 300 end
Pu-240        228  0  3.13646E-08 300 end
'
'        Inner fuel element--fueled Axial region 3
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
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' B-10        231    0   2.04121E-05   293.6   end
' B-11        231    0   8.26896E-05   293.6   end
 O-16         231    0   1.71757E-02   293.6   end
'Mg-24        231    0   1.05686E-04   293.6   end
'Mg-25        231    0   1.33797E-05   293.6   end
'Mg-26        231    0   1.47310E-05   293.6   end
Al-27         231    0   2.89993E-02   293.6   end
'Si-28        231    0   1.02644E-04   293.6   end
'Si-29        231    0   5.19729E-06   293.6   end
'Si-30        231    0   3.45002E-06   293.6   end
'Ti-46        231    0   4.20262E-07   293.6   end
'Ti-47        231    0   3.79000E-07   293.6   end
'Ti-48        231    0   3.75536E-06   293.6   end
'Ti-49        231    0   2.75590E-07   293.6   end
'Ti-50        231    0   2.63873E-07   293.6   end
'Cr-50        231    0   5.30517E-07   293.6   end
'Cr-52        231    0   1.02189E-05   293.6   end
'Cr-53        231    0   1.15860E-06   293.6   end
'Cr-54        231    0   2.87821E-07   293.6   end
'Mn-55        231    0   6.57731E-06   293.6   end
'Fe-54        231    0   2.42259E-06   293.6   end
'Fe-56        231    0   3.79953E-05   293.6   end
'Fe-57        231    0   8.77930E-07   293.6   end
'Fe-58        231    0   1.15953E-07   293.6   end
 U-234        231    0   2.20708E-06   293.6   end
 U-235        231    0   2.20178E-04   293.6   end
 U-236        231    0   8.82838E-07   293.6   end
 U-238        231    0   1.19182E-05   293.6   end
 Pu-239       231  0  5.98421E-07 300 end
Pu-240        231  0  3.13646E-08 300 end
'      total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
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' B-10        232    0   1.77513E-05   293.6   end
' B-11        232    0   7.19107E-05   293.6   end
 O-16         232    0   1.73053E-02   293.6   end
'Mg-24        232    0   1.05686E-04   293.6   end
'Mg-25        232    0   1.33797E-05   293.6   end
'Mg-26        232    0   1.47310E-05   293.6   end
Al-27         232    0   2.88388E-02   293.6   end
'Si-28        232    0   1.02285E-04   293.6   end
'Si-29        232    0   5.17912E-06   293.6   end
'Si-30        232    0   3.43796E-06   293.6   end
'Ti-46        232    0   4.20262E-07   293.6   end
'Ti-47        232    0   3.79000E-07   293.6   end
'Ti-48        232    0   3.75536E-06   293.6   end
'Ti-49        232    0   2.75590E-07   293.6   end
'Ti-50        232    0   2.63873E-07   293.6   end
'Cr-50        232    0   5.30517E-07   293.6   end
'Cr-52        232    0   1.02189E-05   293.6   end
'Cr-53        232    0   1.15860E-06   293.6   end
'Cr-54        232    0   2.87821E-07   293.6   end
'Mn-55        232    0   6.55746E-06   293.6   end
'Fe-54        232    0   2.41117E-06   293.6   end
'Fe-56        232    0   3.78162E-05   293.6   end
'Fe-57        232    0   8.73792E-07   293.6   end
'Fe-58        232    0   1.15406E-07   293.6   end
 U-234        232    0   2.69313E-06   293.6   end
 U-235        232    0   2.65478E-04   293.6   end
 U-236        232    0   1.07726E-06   293.6   end
 U-238        232    0   1.45429E-05   293.6   end
 Pu-239       232  0  5.98421E-07 300 end
Pu-240        232  0  3.13646E-08 300 end
'      total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1          233    0   3.32435E-02   293.6   end
' B-10        233    0   1.46911E-05   293.6   end
' B-11        233    0   5.95139E-05   293.6   end
 O-16         233    0   1.74543E-02   293.6   end
'Mg-24        233    0   1.05686E-04   293.6   end
'Mg-25        233    0   1.33797E-05   293.6   end
'Mg-26        233    0   1.47310E-05   293.6   end
Al-27         233    0   2.86541E-02   293.6   end
'Si-28        233    0   1.01874E-04   293.6   end
'Si-29        233    0   5.15831E-06   293.6   end
'Si-30        233    0   3.42415E-06   293.6   end
'Ti-46        233    0   4.20263E-07   293.6   end
'Ti-47        233    0   3.79001E-07   293.6   end
'Ti-48        233    0   3.75537E-06   293.6   end
'Ti-49        233    0   2.75590E-07   293.6   end
'Ti-50        233    0   2.63873E-07   293.6   end
'Cr-50        233    0   5.30518E-07   293.6   end
'Cr-52        233    0   1.02189E-05   293.6   end
'Cr-53        233    0   1.15860E-06   293.6   end
'Cr-54        233    0   2.87821E-07   293.6   end
'Mn-55        233    0   6.53464E-06   293.6   end
'Fe-54        233    0   2.39803E-06   293.6   end
'Fe-56        233    0   3.76103E-05   293.6   end
'Fe-57        233    0   8.69031E-07   293.6   end
'Fe-58        233    0   1.14778E-07   293.6   end
 U-234        233    0   3.25215E-06   293.6   end
 U-235        233    0   3.17578E-04   293.6   end
 U-236        233    0   1.30087E-06   293.6   end
 U-238        233    0   1.75616E-05   293.6   end
 Pu-239       233  0  5.98421E-07 300 end
Pu-240        233  0  3.13646E-08 300 end
'      total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1          234    0   3.32434E-02   293.6   end
' B-10        234    0   1.03798E-05   293.6   end
' B-11        234    0   4.20486E-05   293.6   end
 O-16         234    0   1.76644E-02   293.6   end
'Mg-24        234    0   1.05686E-04   293.6   end
'Mg-25        234    0   1.33797E-05   293.6   end
'Mg-26        234    0   1.47310E-05   293.6   end
Al-27         234    0   2.83940E-02   293.6   end
'Si-28        234    0   1.01293E-04   293.6   end
'Si-29        234    0   5.12887E-06   293.6   end
'Si-30        234    0   3.40461E-06   293.6   end
'Ti-46        234    0   4.20262E-07   293.6   end
'Ti-47        234    0   3.79000E-07   293.6   end
'Ti-48        234    0   3.75536E-06   293.6   end
'Ti-49        234    0   2.75590E-07   293.6   end
'Ti-50        234    0   2.63873E-07   293.6   end
'Cr-50        234    0   5.30517E-07   293.6   end
'Cr-52        234    0   1.02189E-05   293.6   end
'Cr-53        234    0   1.15860E-06   293.6   end
'Cr-54        234    0   2.87821E-07   293.6   end
'Mn-55        234    0   6.50246E-06   293.6   end
'Fe-54        234    0   2.37952E-06   293.6   end
'Fe-56        234    0   3.73198E-05   293.6   end
'Fe-57        234    0   8.62321E-07   293.6   end
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 U-234        234    0   4.03970E-06   293.6   end
 U-235        234    0   3.90978E-04   293.6   end
 U-236        234    0   1.61589E-06   293.6   end
 U-238        234    0   2.18144E-05   293.6   end
 Pu-239       234  0  5.98421E-07 300 end
Pu-240        234  0  3.13646E-08 300 end
'      total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1          235    0   3.32434E-02   293.6   end
' B-10        235    0   6.18010E-06   293.6   end
' B-11        235    0   2.50356E-05   293.6   end
 O-16         235    0   1.78689E-02   293.6   end
'Mg-24        235    0   1.05686E-04   293.6   end
'Mg-25        235    0   1.33797E-05   293.6   end
'Mg-26        235    0   1.47310E-05   293.6   end
Al-27         235    0   2.81406E-02   293.6   end
'Si-28        235    0   1.00727E-04   293.6   end
'Si-29        235    0   5.10026E-06   293.6   end
'Si-30        235    0   3.38560E-06   293.6   end
'Ti-46        235    0   4.20262E-07   293.6   end
'Ti-47        235    0   3.79000E-07   293.6   end
'Ti-48        235    0   3.75536E-06   293.6   end
'Ti-49        235    0   2.75590E-07   293.6   end
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'Ti-50          235    0   2.63873E-07   293.6   end
'Cr-50          235    0   5.30518E-07   293.6   end
'Cr-52          235    0   1.02189E-05   293.6   end
'Cr-53          235    0   1.15860E-06   293.6   end
'Cr-54          235    0   2.87821E-07   293.6   end
'Mn-55           235    0   6.47114E-06   293.6   end
'Fe-54          235    0   2.36149E-06   293.6   end
'Fe-56          235    0   3.70370E-05   293.6   end
'Fe-57          235    0   8.55788E-07   293.6   end
'Fe-58          235    0   1.13028E-07   293.6   end
 U-234          235    0   4.80687E-06   293.6   end
 U-235          235    0   4.62478E-04   293.6   end
 U-236          235    0   1.92276E-06   293.6   end
 U-238          235    0   2.59571E-05   293.6   end
 Pu-239         235  0  5.98421E-07 300 end
Pu-240          235  0  3.13646E-08 300 end
'       total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1            236    0   3.32434E-02   293.6   end
' B-10           236    0   5.79830E-06   293.6   end
' B-11           236    0   2.34889E-05   293.6   end
 O-16           236    0   1.78875E-02   293.6   end
'Mg-24           236    0   1.05686E-04   293.6   end
'Mg-25           236    0   1.33797E-05   293.6   end
'Mg-26           236    0   1.47310E-05   293.6   end
Al-27           236    0   2.81176E-02   293.6   end
'Si-28          236    0   1.00676E-04   293.6   end
'Si-29          236    0   5.09768E-06   293.6   end
'Si-30          236    0   3.38390E-06   293.6   end
'Ti-46          236    0   4.20262E-07   293.6   end
'Ti-47          236    0   3.79000E-07   293.6   end
'Ti-48          236    0   3.75536E-06   293.6   end
'Ti-49          236    0   2.75590E-07   293.6   end
'Ti-50          236    0   2.63873E-07   293.6   end
'Cr-50          236    0   5.30517E-07   293.6   end
'Cr-52          236    0   1.02189E-05   293.6   end
'Cr-53          236    0   1.15860E-06   293.6   end
'Cr-54          236    0   2.87821E-07   293.6   end
'Mn-55           236    0   6.46828E-06   293.6   end
'Fe-54          236    0   2.35985E-06   293.6   end
'Fe-56          236    0   3.70113E-05   293.6   end
'Fe-57          236    0   8.55193E-07   293.6   end
'Fe-58          236    0   1.12950E-07   293.6   end
 U-234          236    0   4.87661E-06   293.6   end
 U-235          236    0   4.68978E-04   293.6   end
 U-236          236    0   1.95066E-06   293.6   end
 U-238          236    0   2.63337E-05   293.6   end
 Pu-239         236  0  5.98421E-07 300 end
Pu-240          236  0  3.13646E-08 300 end
'       total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1            237    0   3.32434E-02   293.6   end
' B-10           237    0   7.99507E-06   293.6   end
' B-11           237    0   3.23880E-05   293.6   end
 O-16           237    0   1.77805E-02   293.6   end
'Mg-24           237    0   1.05686E-04   293.6   end
'Mg-25           237    0   1.33797E-05   293.6   end
'Mg-26           237    0   1.47310E-05   293.6   end
Al-27           237    0   2.82501E-02   293.6   end
'Si-28          237    0   1.00972E-04   293.6   end
'Si-29          237    0   5.11262E-06   293.6   end
'Si-30          237    0   3.39382E-06   293.6   end
'Ti-46          237    0   4.20262E-07   293.6   end
'Ti-47          237    0   3.79000E-07   293.6   end
'Ti-48          237    0   3.75536E-06   293.6   end
'Ti-49          237    0   2.75590E-07   293.6   end
'Ti-50          237    0   2.63873E-07   293.6   end
'Cr-50          237    0   5.30517E-07   293.6   end
'Cr-52          237    0   1.02189E-05   293.6   end
'Cr-53          237    0   1.15860E-06   293.6   end
'Cr-54          237    0   2.87821E-07   293.6   end
'Mn-55           237    0   6.48467E-06   293.6   end
'Fe-54          237    0   2.36928E-06   293.6   end
'Fe-56          237    0   3.71592E-05   293.6   end
'Fe-57          237    0   8.58611E-07   293.6   end
'Fe-58          237    0   1.13401E-07   293.6   end
 U-234          237    0   4.47532E-06   293.6   end
 U-235          237    0   4.31578E-04   293.6   end
 U-236          237    0   1.79014E-06   293.6   end
 U-238          237    0   2.41667E-05   293.6   end
 Pu-239         237  0  5.98421E-07 300 end
Pu-240          237  0  3.13646E-08 300 end
'       total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1            238    0   3.32434E-02   293.6   end
' B-10           238    0   1.06559E-05   293.6   end
' B-11           238    0   4.31670E-05   293.6   end
 O-16           238    0   1.76509E-02   293.6   end
'Mg-24           238    0   1.05686E-04   293.6   end
'Mg-25           238    0   1.33797E-05   293.6   end
'Mg-26           238    0   1.47310E-05   293.6   end
Al-27           238    0   2.84107E-02   293.6   end
'Si-28          238    0   1.01330E-04   293.6   end
'Si-29          238    0   5.13079E-06   293.6   end
'Si-30          238    0   3.40588E-06   293.6   end
'Ti-46          238    0   4.20262E-07   293.6   end
'Ti-47          238    0   3.79000E-07   293.6   end
'Ti-48          238    0   3.75536E-06   293.6   end
'Ti-49          238    0   2.75590E-07   293.6   end
'Ti-50          238    0   2.63873E-07   293.6   end
'Cr-50          238    0   5.30517E-07   293.6   end
'Cr-52          238    0   1.02189E-05   293.6   end
'Cr-53          238    0   1.15860E-06   293.6   end
'Cr-54          238    0   2.87821E-07   293.6   end
'Mn-55           238    0   6.50452E-06   293.6   end
'Fe-54          238    0   2.38070E-06   293.6   end
'Fe-56          238    0   3.73384E-05   293.6   end
'Fe-57          238    0   8.62751E-07   293.6   end
'Fe-58          238    0   1.13948E-07   293.6   end
 U-234          238    0   3.98927E-06   293.6   end
 U-235          238    0   3.86278E-04   293.6   end
 U-236          238    0   1.59572E-06   293.6   end
 U-238          238    0   2.15420E-05   293.6   end
 Pu-239         238  0  5.98421E-07 300 end
Pu-240          238  0  3.13646E-08 300 end
'
'       Inner fuel element--fueled Axial region 4
'       total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1            241    0   3.32434E-02   293.6   end
' B-10           241    0   2.04121E-05   293.6   end
' B-11           241    0   8.26896E-05   293.6   end
 O-16           241    0   1.71757E-02   293.6   end
'Mg-24           241    0   1.05686E-04   293.6   end
'Mg-25           241    0   1.33797E-05   293.6   end
'Mg-26           241    0   1.47310E-05   293.6   end
Al-27           241    0   2.89993E-02   293.6   end
'Si-28          241    0   1.02644E-04   293.6   end
'Si-29          241    0   5.19729E-06   293.6   end
'Si-30          241    0   3.45002E-06   293.6   end
'Ti-46          241    0   4.20262E-07   293.6   end
'Ti-47          241    0   3.79000E-07   293.6   end
'Ti-48          241    0   3.75536E-06   293.6   end
'Ti-49          241    0   2.75590E-07   293.6   end
'Ti-50          241    0   2.63873E-07   293.6   end
'Cr-50          241    0   5.30517E-07   293.6   end
'Cr-52          241    0   1.02189E-05   293.6   end
'Cr-53          241    0   1.15860E-06   293.6   end
'Cr-54          241    0   2.87821E-07   293.6   end
'Mn-55           241    0   6.57731E-06   293.6   end
'Fe-54          241    0   2.42259E-06   293.6   end
'Fe-56          241    0   3.79953E-05   293.6   end
'Fe-57          241    0   8.77930E-07   293.6   end
'Fe-58          241    0   1.15953E-07   293.6   end
 U-234          241    0   2.20708E-06   293.6   end
 U-235          241    0   2.20178E-04   293.6   end
 U-236          241    0   8.82838E-07   293.6   end
 U-238          241    0   1.19182E-05   293.6   end
 Pu-239         241  0  5.98421E-07 300 end
Pu-240          241  0  3.13646E-08 300 end
'       total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1            242    0   3.32434E-02   293.6   end
' B-10           242    0   1.77513E-05   293.6   end
' B-11           242    0   7.19107E-05   293.6   end
 O-16           242    0   1.73053E-02   293.6   end
'Mg-24           242    0   1.05686E-04   293.6   end
'Mg-25           242    0   1.33797E-05   293.6   end
'Mg-26           242    0   1.47310E-05   293.6   end
Al-27           242    0   2.88388E-02   293.6   end
'Si-28          242    0   1.02285E-04   293.6   end
'Si-29          242    0   5.17912E-06   293.6   end
'Si-30          242    0   3.43796E-06   293.6   end
'Ti-46          242    0   4.20262E-07   293.6   end
'Ti-47          242    0   3.79000E-07   293.6   end
'Ti-48          242    0   3.75536E-06   293.6   end
'Ti-49          242    0   2.75590E-07   293.6   end
'Ti-50          242    0   2.63873E-07   293.6   end
'Cr-50          242    0   5.30517E-07   293.6   end
'Cr-52          242    0   1.02189E-05   293.6   end
'Cr-53          242    0   1.15860E-06   293.6   end
'Cr-54          242    0   2.87821E-07   293.6   end
'Mn-55           242    0   6.55746E-06   293.6   end
'Fe-54          242    0   2.41117E-06   293.6   end
'Fe-56          242    0   3.78162E-05   293.6   end
'Fe-57          242    0   8.73792E-07   293.6   end
'Fe-58          242    0   1.15406E-07   293.6   end
 U-234          242    0   2.69313E-06   293.6   end
 U-235          242    0   2.65478E-04   293.6   end
 U-236          242    0   1.07726E-06   293.6   end
 U-238          242    0   1.45429E-05   293.6   end
 Pu-239         242  0  5.98421E-07 300 end
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Pu-240      242  0  3.13646E-08 300 end
'     total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1        243   0   3.32435E-02   293.6   end
' B-10      243   0   1.46911E-05   293.6   end
' B-11      243   0   5.95139E-05   293.6   end
 O-16       243   0   1.74543E-02   293.6   end
'Mg-24      243   0   1.05686E-04   293.6   end
'Mg-25      243   0   1.33797E-05   293.6   end
'Mg-26      243   0   1.47310E-05   293.6   end
Al-27       243   0   2.86541E-02   293.6   end
'Si-28      243   0   1.01874E-04   293.6   end
'Si-29      243   0   5.15831E-06   293.6   end
'Si-30      243   0   3.42415E-06   293.6   end
'Ti-46      243   0   4.20263E-07   293.6   end
'Ti-47      243   0   3.79001E-07   293.6   end
'Ti-48      243   0   3.75537E-06   293.6   end
'Ti-49      243   0   2.75590E-07   293.6   end
'Ti-50      243   0   2.63873E-07   293.6   end
'Cr-50      243   0   5.30518E-07   293.6   end
'Cr-52      243   0   1.02189E-05   293.6   end
'Cr-53      243   0   1.15860E-06   293.6   end
'Cr-54      243   0   2.87821E-07   293.6   end
'Mn-55      243   0   6.53464E-06   293.6   end
'Fe-54      243   0   2.39803E-06   293.6   end
'Fe-56      243   0   3.76103E-05   293.6   end
'Fe-57      243   0   8.69031E-07   293.6   end
'Fe-58      243   0   1.14778E-07   293.6   end
 U-234      243   0   3.25215E-06   293.6   end
 U-235      243   0   3.17578E-04   293.6   end
 U-236      243   0   1.30087E-06   293.6   end
 U-238      243   0   1.75616E-05   293.6   end
 Pu-239     243  0  5.98421E-07 300 end
Pu-240      243  0  3.13646E-08 300 end
'     total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1        244   0   3.32434E-02   293.6   end
' B-10      244   0   1.03798E-05   293.6   end
' B-11      244   0   4.20486E-05   293.6   end
 O-16       244   0   1.76644E-02   293.6   end
'Mg-24      244   0   1.05686E-04   293.6   end
'Mg-25      244   0   1.33797E-05   293.6   end
'Mg-26      244   0   1.47310E-05   293.6   end
Al-27       244   0   2.83940E-02   293.6   end
'Si-28      244   0   1.01293E-04   293.6   end
'Si-29      244   0   5.12887E-06   293.6   end
'Si-30      244   0   3.40461E-06   293.6   end
'Ti-46      244   0   4.20262E-07   293.6   end
'Ti-47      244   0   3.79000E-07   293.6   end
'Ti-48      244   0   3.75536E-06   293.6   end
'Ti-49      244   0   2.75590E-07   293.6   end
'Ti-50      244   0   2.63873E-07   293.6   end
'Cr-50      244   0   5.30517E-07   293.6   end
'Cr-52      244   0   1.02189E-05   293.6   end
'Cr-53      244   0   1.15860E-06   293.6   end
'Cr-54      244   0   2.87821E-07   293.6   end
'Mn-55      244   0   6.50246E-06   293.6   end
'Fe-54      244   0   2.37952E-06   293.6   end
'Fe-56      244   0   3.73198E-05   293.6   end
'Fe-57      244   0   8.62321E-07   293.6   end
'Fe-58      244   0   1.13891E-07   293.6   end
 U-234      244   0   4.03970E-06   293.6   end
 U-235      244   0   3.90978E-04   293.6   end
 U-236      244   0   1.61589E-06   293.6   end
 U-238      244   0   2.18144E-05   293.6   end
 Pu-239     244  0  5.98421E-07 300 end
Pu-240      244  0  3.13646E-08 300 end
'     total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1        245   0   3.32434E-02   293.6   end
' B-10      245   0   6.18010E-06   293.6   end
' B-11      245   0   2.50356E-05   293.6   end
 O-16       245   0   1.78689E-02   293.6   end
'Mg-24      245   0   1.05686E-04   293.6   end
'Mg-25      245   0   1.33797E-05   293.6   end
'Mg-26      245   0   1.47310E-05   293.6   end
Al-27       245   0   2.81406E-02   293.6   end
'Si-28      245   0   1.00727E-04   293.6   end
'Si-29      245   0   5.10026E-06   293.6   end
'Si-30      245   0   3.38560E-06   293.6   end
'Ti-46      245   0   4.20262E-07   293.6   end
'Ti-47      245   0   3.79000E-07   293.6   end
'Ti-48      245   0   3.75536E-06   293.6   end
'Ti-49      245   0   2.75590E-07   293.6   end
'Ti-50      245   0   2.63873E-07   293.6   end
'Cr-50      245   0   5.30518E-07   293.6   end
'Cr-52      245   0   1.02189E-05   293.6   end
'Cr-53      245   0   1.15860E-06   293.6   end
'Cr-54      245   0   2.87821E-07   293.6   end
'Mn-55      245   0   6.47114E-06   293.6   end
'Fe-54      245   0   2.36149E-06   293.6   end
'Fe-56      245   0   3.70370E-05   293.6   end
'Fe-57      245   0   8.55788E-07   293.6   end
'Fe-58      245   0   1.13028E-07   293.6   end
 U-234      245   0   4.80687E-06   293.6   end
 U-235      245   0   4.62478E-04   293.6   end
 U-236      245   0   1.92276E-06   293.6   end
 U-238      245   0   2.59571E-05   293.6   end
 Pu-239     245  0  5.98421E-07 300 end
Pu-240      245  0  3.13646E-08 300 end
'     total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1        246   0   3.32434E-02   293.6   end
' B-10      246   0   5.79830E-06   293.6   end
' B-11      246   0   2.34889E-05   293.6   end
 O-16       246   0   1.78875E-02   293.6   end
'Mg-24      246   0   1.05686E-04   293.6   end
'Mg-25      246   0   1.33797E-05   293.6   end
'Mg-26      246   0   1.47310E-05   293.6   end
Al-27       246   0   2.81176E-02   293.6   end
'Si-28      246   0   1.00676E-04   293.6   end
'Si-29      246   0   5.09768E-06   293.6   end
'Si-30      246   0   3.38390E-06   293.6   end
'Ti-46      246   0   4.20262E-07   293.6   end
'Ti-47      246   0   3.79000E-07   293.6   end
'Ti-48      246   0   3.75536E-06   293.6   end
'Ti-49      246   0   2.75590E-07   293.6   end
'Ti-50      246   0   2.63873E-07   293.6   end
'Cr-50      246   0   5.30517E-07   293.6   end
'Cr-52      246   0   1.02189E-05   293.6   end
'Cr-53      246   0   1.15860E-06   293.6   end
'Cr-54      246   0   2.87821E-07   293.6   end
'Mn-55      246   0   6.46828E-06   293.6   end
'Fe-54      246   0   2.35985E-06   293.6   end
'Fe-56      246   0   3.70113E-05   293.6   end
'Fe-57      246   0   8.55193E-07   293.6   end
'Fe-58      246   0   1.12950E-07   293.6   end
 U-234      246   0   4.87661E-06   293.6   end
 U-235      246   0   4.68978E-04   293.6   end
 U-236      246   0   1.95066E-06   293.6   end
 U-238      246   0   2.63337E-05   293.6   end
 Pu-239     246  0  5.98421E-07 300 end
Pu-240      246  0  3.13646E-08 300 end
'     total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1        247   0   3.32434E-02   293.6   end
' B-10      247   0   7.99507E-06   293.6   end
' B-11      247   0   3.23880E-05   293.6   end
 O-16       247   0   1.77805E-02   293.6   end
'Mg-24      247   0   1.05686E-04   293.6   end
'Mg-25      247   0   1.33797E-05   293.6   end
'Mg-26      247   0   1.47310E-05   293.6   end
Al-27       247   0   2.82501E-02   293.6   end
'Si-28      247   0   1.00972E-04   293.6   end
'Si-29      247   0   5.11262E-06   293.6   end
'Si-30      247   0   3.39382E-06   293.6   end
'Ti-46      247   0   4.20262E-07   293.6   end
'Ti-47      247   0   3.79000E-07   293.6   end
'Ti-48      247   0   3.75536E-06   293.6   end
'Ti-49      247   0   2.75590E-07   293.6   end
'Ti-50      247   0   2.63873E-07   293.6   end
'Cr-50      247   0   5.30517E-07   293.6   end
'Cr-52      247   0   1.02189E-05   293.6   end
'Cr-53      247   0   1.15860E-06   293.6   end
'Cr-54      247   0   2.87821E-07   293.6   end
'Mn-55      247   0   6.48467E-06   293.6   end
'Fe-54      247   0   2.36928E-06   293.6   end
'Fe-56      247   0   3.71592E-05   293.6   end
'Fe-57      247   0   8.58611E-07   293.6   end
'Fe-58      247   0   1.13401E-07   293.6   end
 U-234      247   0   4.47532E-06   293.6   end
 U-235      247   0   4.31578E-04   293.6   end
 U-236      247   0   1.79014E-06   293.6   end
 U-238      247   0   2.41667E-05   293.6   end
 Pu-239     247  0  5.98421E-07 300 end
Pu-240      247  0  3.13646E-08 300 end
'     total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1        248   0   3.32434E-02   293.6   end
' B-10      248   0   1.06559E-05   293.6   end
' B-11      248   0   4.31670E-05   293.6   end
 O-16       248   0   1.76509E-02   293.6   end
'Mg-24      248   0   1.05686E-04   293.6   end
'Mg-25      248   0   1.33797E-05   293.6   end
'Mg-26      248   0   1.47310E-05   293.6   end
Al-27       248   0   2.84107E-02   293.6   end
'Si-28      248   0   1.01330E-04   293.6   end
'Si-29      248   0   5.13079E-06   293.6   end
'Si-30      248   0   3.40588E-06   293.6   end
'Ti-46      248   0   4.20262E-07   293.6   end
'Ti-47      248   0   3.79000E-07   293.6   end
'Ti-48      248   0   3.75536E-06   293.6   end
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'Ti-49          248    0   2.75590E-07   293.6   end
'Ti-50          248    0   2.63873E-07   293.6   end
'Cr-50          248    0   5.30517E-07   293.6   end
'Cr-52          248    0   1.02189E-05   293.6   end
'Cr-53          248    0   1.15860E-06   293.6   end
'Cr-54          248    0   2.87821E-07   293.6   end
'Mn-55          248    0   6.50452E-06   293.6   end
'Fe-54          248    0   2.38070E-06   293.6   end
'Fe-56          248    0   3.73384E-05   293.6   end
'Fe-57          248    0   8.62751E-07   293.6   end
'Fe-58          248    0   1.13948E-07   293.6   end
 U-234          248    0   3.98927E-06   293.6   end
 U-235          248    0   3.86278E-04   293.6   end
 U-236          248    0   1.59572E-06   293.6   end
 U-238          248    0   2.15420E-05   293.6   end
 Pu-239         248  0  5.98421E-07 300 end
Pu-240          248  0  3.13646E-08 300 end
'
'         Inner fuel element--fueled Axial region 5
'       total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1            251    0   3.32434E-02   293.6   end
' B-10           251    0   2.04121E-05   293.6   end
' B-11           251    0   8.26896E-05   293.6   end
 O-16           251    0   1.71757E-02   293.6   end
'Mg-24          251    0   1.05686E-04   293.6   end
'Mg-25          251    0   1.33797E-05   293.6   end
'Mg-26          251    0   1.47310E-05   293.6   end
Al-27           251    0   2.89993E-02   293.6   end
'Si-28          251    0   1.02644E-04   293.6   end
'Si-29          251    0   5.19729E-06   293.6   end
'Si-30          251    0   3.45002E-06   293.6   end
'Ti-46          251    0   4.20262E-07   293.6   end
'Ti-47          251    0   3.79000E-07   293.6   end
'Ti-48          251    0   3.75536E-06   293.6   end
'Ti-49          251    0   2.75590E-07   293.6   end
'Ti-50          251    0   2.63873E-07   293.6   end
'Cr-50          251    0   5.30517E-07   293.6   end
'Cr-52          251    0   1.02189E-05   293.6   end
'Cr-53          251    0   1.15860E-06   293.6   end
'Cr-54          251    0   2.87821E-07   293.6   end
'Mn-55          251    0   6.57731E-06   293.6   end
'Fe-54          251    0   2.42259E-06   293.6   end
'Fe-56          251    0   3.79953E-05   293.6   end
'Fe-57          251    0   8.77930E-07   293.6   end
'Fe-58          251    0   1.15953E-07   293.6   end
 U-234          251    0   2.20708E-06   293.6   end
 U-235          251    0   2.20178E-04   293.6   end
 U-236          251    0   8.82838E-07   293.6   end
 U-238          251    0   1.19182E-05   293.6   end
 Pu-239         251  0  5.98421E-07 300 end
Pu-240          251  0  3.13646E-08 300 end
'       total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1            252    0   3.32434E-02   293.6   end
' B-10           252    0   1.77513E-05   293.6   end
' B-11           252    0   7.19107E-05   293.6   end
 O-16           252    0   1.73053E-02   293.6   end
'Mg-24          252    0   1.05686E-04   293.6   end
'Mg-25          252    0   1.33797E-05   293.6   end
'Mg-26          252    0   1.47310E-05   293.6   end
Al-27           252    0   2.88388E-02   293.6   end
'Si-28          252    0   1.02285E-04   293.6   end
'Si-29          252    0   5.17912E-06   293.6   end
'Si-30          252    0   3.43796E-06   293.6   end
'Ti-46          252    0   4.20262E-07   293.6   end
'Ti-47          252    0   3.79000E-07   293.6   end
'Ti-48          252    0   3.75536E-06   293.6   end
'Ti-49          252    0   2.75590E-07   293.6   end
'Ti-50          252    0   2.63873E-07   293.6   end
'Cr-50          252    0   5.30517E-07   293.6   end
'Cr-52          252    0   1.02189E-05   293.6   end
'Cr-53          252    0   1.15860E-06   293.6   end
'Cr-54          252    0   2.87821E-07   293.6   end
'Mn-55          252    0   6.55746E-06   293.6   end
'Fe-54          252    0   2.41117E-06   293.6   end
'Fe-56          252    0   3.78162E-05   293.6   end
'Fe-57          252    0   8.73792E-07   293.6   end
'Fe-58          252    0   1.15406E-07   293.6   end
 U-234          252    0   2.69313E-06   293.6   end
 U-235          252    0   2.65478E-04   293.6   end
 U-236          252    0   1.07726E-06   293.6   end
 U-238          252    0   1.45429E-05   293.6   end
 Pu-239         252  0  5.98421E-07 300 end
Pu-240          252  0  3.13646E-08 300 end
'       total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1            253    0   3.32435E-02   293.6   end
' B-10           253    0   1.46911E-05   293.6   end
' B-11           253    0   5.95139E-05   293.6   end
 O-16           253    0   1.74543E-02   293.6   end
'Mg-24          253    0   1.05686E-04   293.6   end
'Mg-25          253    0   1.33797E-05   293.6   end
'Mg-26          253    0   1.47310E-05   293.6   end
Al-27           253    0   2.86541E-02   293.6   end
'Si-28          253    0   1.01874E-04   293.6   end
'Si-29          253    0   5.15831E-06   293.6   end
'Si-30          253    0   3.42415E-06   293.6   end
'Ti-46          253    0   4.20263E-07   293.6   end
'Ti-47          253    0   3.79001E-07   293.6   end
'Ti-48          253    0   3.75537E-06   293.6   end
'Ti-49          253    0   2.75590E-07   293.6   end
'Ti-50          253    0   2.63873E-07   293.6   end
'Cr-50          253    0   5.30518E-07   293.6   end
'Cr-52          253    0   1.02189E-05   293.6   end
'Cr-53          253    0   1.15860E-06   293.6   end
'Cr-54          253    0   2.87821E-07   293.6   end
'Mn-55          253    0   6.53464E-06   293.6   end
'Fe-54          253    0   2.39803E-06   293.6   end
'Fe-56          253    0   3.76103E-05   293.6   end
'Fe-57          253    0   8.69031E-07   293.6   end
'Fe-58          253    0   1.14778E-07   293.6   end
 U-234          253    0   3.25215E-06   293.6   end
 U-235          253    0   3.17578E-04   293.6   end
 U-236          253    0   1.30087E-06   293.6   end
 U-238          253    0   1.75616E-05   293.6   end
 Pu-239         253  0  5.98421E-07 300 end
Pu-240          253  0  3.13646E-08 300 end
'       total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1            254    0   3.32434E-02   293.6   end
' B-10           254    0   1.03798E-05   293.6   end
' B-11           254    0   4.20486E-05   293.6   end
 O-16           254    0   1.76644E-02   293.6   end
'Mg-24          254    0   1.05686E-04   293.6   end
'Mg-25          254    0   1.33797E-05   293.6   end
'Mg-26          254    0   1.47310E-05   293.6   end
Al-27           254    0   2.83940E-02   293.6   end
'Si-28          254    0   1.01293E-04   293.6   end
'Si-29          254    0   5.12887E-06   293.6   end
'Si-30          254    0   3.40461E-06   293.6   end
'Ti-46          254    0   4.20262E-07   293.6   end
'Ti-47          254    0   3.79000E-07   293.6   end
'Ti-48          254    0   3.75536E-06   293.6   end
'Ti-49          254    0   2.75590E-07   293.6   end
'Ti-50          254    0   2.63873E-07   293.6   end
'Cr-50          254    0   5.30517E-07   293.6   end
'Cr-52          254    0   1.02189E-05   293.6   end
'Cr-53          254    0   1.15860E-06   293.6   end
'Cr-54          254    0   2.87821E-07   293.6   end
'Mn-55          254    0   6.50246E-06   293.6   end
'Fe-54          254    0   2.37952E-06   293.6   end
'Fe-56          254    0   3.73198E-05   293.6   end
'Fe-57          254    0   8.62321E-07   293.6   end
'Fe-58          254    0   1.13891E-07   293.6   end
'Cu-63          254    0   1.89710E-05   293.6   end
'Cu-65          254    0   8.45562E-06   293.6   end
 U-234          254    0   4.03970E-06   293.6   end
 U-235          254    0   3.90978E-04   293.6   end
 U-236          254    0   1.61589E-06   293.6   end
 U-238          254    0   2.18144E-05   293.6   end
 Pu-239         254  0  5.98421E-07 300 end
Pu-240          254  0  3.13646E-08 300 end
'       total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1            255    0   3.32434E-02   293.6   end
' B-10           255    0   6.18010E-06   293.6   end
' B-11           255    0   2.50356E-05   293.6   end
 O-16           255    0   1.78689E-02   293.6   end
'Mg-24          255    0   1.05686E-04   293.6   end
'Mg-25          255    0   1.33797E-05   293.6   end
'Mg-26          255    0   1.47310E-05   293.6   end
Al-27           255    0   2.81406E-02   293.6   end
'Si-28          255    0   1.00727E-04   293.6   end
'Si-29          255    0   5.10026E-06   293.6   end
'Si-30          255    0   3.38560E-06   293.6   end
'Ti-46          255    0   4.20262E-07   293.6   end
'Ti-47          255    0   3.79000E-07   293.6   end
'Ti-48          255    0   3.75536E-06   293.6   end
'Ti-49          255    0   2.75590E-07   293.6   end
'Ti-50          255    0   2.63873E-07   293.6   end
'Cr-50          255    0   5.30518E-07   293.6   end
'Cr-52          255    0   1.02189E-05   293.6   end
'Cr-53          255    0   1.15860E-06   293.6   end
'Cr-54          255    0   2.87821E-07   293.6   end
'Mn-55          255    0   6.47114E-06   293.6   end
'Fe-54          255    0   2.36149E-06   293.6   end
'Fe-56          255    0   3.70370E-05   293.6   end
'Fe-57          255    0   8.55788E-07   293.6   end
'Fe-58          255    0   1.13028E-07   293.6   end
'Cu-63          255    0   1.88666E-05   293.6   end
'Cu-65          255    0   8.40911E-06   293.6   end
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 U-234      255   0  4.80687E-06  293.6  end
 U-235      255   0  4.62478E-04  293.6  end
 U-236      255   0  1.92276E-06  293.6  end
 U-238      255   0  2.59571E-05  293.6  end
 Pu-239     255  0  5.98421E-07 300 end
Pu-240     255  0  3.13646E-08 300 end
'      total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1        256   0  3.32434E-02  293.6  end
' B-10      256   0  5.79830E-06  293.6  end
' B-11      256   0  2.34889E-05  293.6  end
 O-16       256   0  1.78875E-02  293.6  end
'Mg-24      256   0  1.05686E-04  293.6  end
'Mg-25      256   0  1.33797E-05  293.6  end
'Mg-26      256   0  1.47310E-05  293.6  end
Al-27       256   0  2.81176E-02  293.6  end
'Si-28      256   0  1.00676E-04  293.6  end
'Si-29      256   0  5.09768E-06  293.6  end
'Si-30      256   0  3.38390E-06  293.6  end
'Ti-46      256   0  4.20262E-07  293.6  end
'Ti-47      256   0  3.79000E-07  293.6  end
'Ti-48      256   0  3.75536E-06  293.6  end
'Ti-49      256   0  2.75590E-07  293.6  end
'Ti-50      256   0  2.63873E-07  293.6  end
'Cr-50      256   0  5.30517E-07  293.6  end
'Cr-52      256   0  1.02189E-05  293.6  end
'Cr-53      256   0  1.15860E-06  293.6  end
'Cr-54      256   0  2.87821E-07  293.6  end
'Mn-55      256   0  6.46828E-06  293.6  end
'Fe-54      256   0  2.35985E-06  293.6  end
'Fe-56      256   0  3.70113E-05  293.6  end
'Fe-57      256   0  8.55193E-07  293.6  end
'Fe-58      256   0  1.12950E-07  293.6  end
'Cu-63      256   0  1.88571E-05  293.6  end
'Cu-65      256   0  8.40487E-06  293.6  end
 U-234      256   0  4.87661E-06  293.6  end
 U-235      256   0  4.68978E-04  293.6  end
 U-236      256   0  1.95066E-06  293.6  end
 U-238      256   0  2.63337E-05  293.6  end
 Pu-239     256  0  5.98421E-07 300 end
Pu-240     256  0  3.13646E-08 300 end
'      total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1        257   0  3.32434E-02  293.6  end
' B-10      257   0  7.99507E-06  293.6  end
' B-11      257   0  3.23880E-05  293.6  end
 O-16       257   0  1.77805E-02  293.6  end
'Mg-24      257   0  1.05686E-04  293.6  end
'Mg-25      257   0  1.33797E-05  293.6  end
'Mg-26      257   0  1.47310E-05  293.6  end
Al-27       257   0  2.82501E-02  293.6  end
'Si-28      257   0  1.00972E-04  293.6  end
'Si-29      257   0  5.11262E-06  293.6  end
'Si-30      257   0  3.39382E-06  293.6  end
'Ti-46      257   0  4.20262E-07  293.6  end
'Ti-47      257   0  3.79000E-07  293.6  end
'Ti-48      257   0  3.75536E-06  293.6  end
'Ti-49      257   0  2.75590E-07  293.6  end
'Ti-50      257   0  2.63873E-07  293.6  end
'Cr-50      257   0  5.30517E-07  293.6  end
'Cr-52      257   0  1.02189E-05  293.6  end
'Cr-53      257   0  1.15860E-06  293.6  end
'Cr-54      257   0  2.87821E-07  293.6  end
'Mn-55      257   0  6.48467E-06  293.6  end
'Fe-54      257   0  2.36928E-06  293.6  end
'Fe-56      257   0  3.71592E-05  293.6  end
'Fe-57      257   0  8.58611E-07  293.6  end
'Fe-58      257   0  1.13401E-07  293.6  end
'Cu-63      257   0  1.89118E-05  293.6  end
'Cu-65      257   0  8.42923E-06  293.6  end
 U-234      257   0  4.47532E-06  293.6  end
 U-235      257   0  4.31578E-04  293.6  end
 U-236      257   0  1.79014E-06  293.6  end
 U-238      257   0  2.41667E-05  293.6  end
 Pu-239     257  0  5.98421E-07 300 end
Pu-240     257  0  3.13646E-08 300 end
'      total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1        258   0  3.32434E-02  293.6  end
' B-10      258   0  1.06559E-05  293.6  end
' B-11      258   0  4.31670E-05  293.6  end
 O-16       258   0  1.76509E-02  293.6  end
'Mg-24      258   0  1.05686E-04  293.6  end
'Mg-25      258   0  1.33797E-05  293.6  end
'Mg-26      258   0  1.47310E-05  293.6  end
Al-27       258   0  2.84107E-02  293.6  end
'Si-28      258   0  1.01330E-04  293.6  end
'Si-29      258   0  5.13079E-06  293.6  end
'Si-30      258   0  3.40588E-06  293.6  end
'Ti-46      258   0  4.20262E-07  293.6  end
'Ti-47      258   0  3.79000E-07  293.6  end
'Ti-48      258   0  3.75536E-06  293.6  end
'Ti-49      258   0  2.75590E-07  293.6  end
'Ti-50      258   0  2.63873E-07  293.6  end
'Cr-50      258   0  5.30517E-07  293.6  end
'Cr-52      258   0  1.02189E-05  293.6  end
'Cr-53      258   0  1.15860E-06  293.6  end
'Cr-54      258   0  2.87821E-07  293.6  end
'Mn-55      258   0  6.50452E-06  293.6  end
'Fe-54      258   0  2.38070E-06  293.6  end
'Fe-56      258   0  3.73384E-05  293.6  end
'Fe-57      258   0  8.62751E-07  293.6  end
'Fe-58      258   0  1.13948E-07  293.6  end
'Cu-63      258   0  1.89779E-05  293.6  end
'Cu-65      258   0  8.45870E-06  293.6  end
 U-234      258   0  3.98927E-06  293.6  end
 U-235      258   0  3.86278E-04  293.6  end
 U-236      258   0  1.59572E-06  293.6  end
 U-238      258   0  2.15420E-05  293.6  end
 Pu-239     258  0  5.98421E-07 300 end
Pu-240     258  0  3.13646E-08 300 end
'
'        Inner fuel element--fueled Axial region 6
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1        261   0  3.32434E-02  293.6  end
' B-10      261   0  2.04121E-05  293.6  end
' B-11      261   0  8.26896E-05  293.6  end
 O-16       261   0  1.71757E-02  293.6  end
'Mg-24      261   0  1.05686E-04  293.6  end
'Mg-25      261   0  1.33797E-05  293.6  end
'Mg-26      261   0  1.47310E-05  293.6  end
Al-27       261   0  2.89993E-02  293.6  end
'Si-28      261   0  1.02644E-04  293.6  end
'Si-29      261   0  5.19729E-06  293.6  end
'Si-30      261   0  3.45002E-06  293.6  end
'Ti-46      261   0  4.20262E-07  293.6  end
'Ti-47      261   0  3.79000E-07  293.6  end
'Ti-48      261   0  3.75536E-06  293.6  end
'Ti-49      261   0  2.75590E-07  293.6  end
'Ti-50      261   0  2.63873E-07  293.6  end
'Cr-50      261   0  5.30517E-07  293.6  end
'Cr-52      261   0  1.02189E-05  293.6  end
'Cr-53      261   0  1.15860E-06  293.6  end
'Cr-54      261   0  2.87821E-07  293.6  end
'Mn-55      261   0  6.57731E-06  293.6  end
'Fe-54      261   0  2.42259E-06  293.6  end
'Fe-56      261   0  3.79953E-05  293.6  end
'Fe-57      261   0  8.77930E-07  293.6  end
'Fe-58      261   0  1.15953E-07  293.6  end
'Cu-63      261   0  1.92203E-05  293.6  end
'Cu-65      261   0  8.56676E-06  293.6  end
 U-234      261   0  2.20708E-06  293.6  end
 U-235      261   0  2.20178E-04  293.6  end
 U-236      261   0  8.82838E-07  293.6  end
 U-238      261   0  1.19182E-05  293.6  end
 Pu-239     261  0  5.98421E-07 300 end
Pu-240     261  0  3.13646E-08 300 end
'      total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1        262   0  3.32434E-02  293.6  end
' B-10      262   0  1.77513E-05  293.6  end
' B-11      262   0  7.19107E-05  293.6  end
 O-16       262   0  1.73053E-02  293.6  end
'Mg-24      262   0  1.05686E-04  293.6  end
'Mg-25      262   0  1.33797E-05  293.6  end
'Mg-26      262   0  1.47310E-05  293.6  end
Al-27       262   0  2.88388E-02  293.6  end
'Si-28      262   0  1.02285E-04  293.6  end
'Si-29      262   0  5.17912E-06  293.6  end
'Si-30      262   0  3.43796E-06  293.6  end
'Ti-46      262   0  4.20262E-07  293.6  end
'Ti-47      262   0  3.79000E-07  293.6  end
'Ti-48      262   0  3.75536E-06  293.6  end
'Ti-49      262   0  2.75590E-07  293.6  end
'Ti-50      262   0  2.63873E-07  293.6  end
'Cr-50      262   0  5.30517E-07  293.6  end
'Cr-52      262   0  1.02189E-05  293.6  end
'Cr-53      262   0  1.15860E-06  293.6  end
'Cr-54      262   0  2.87821E-07  293.6  end
'Mn-55      262   0  6.55746E-06  293.6  end
'Fe-54      262   0  2.41117E-06  293.6  end
'Fe-56      262   0  3.78162E-05  293.6  end
'Fe-57      262   0  8.73792E-07  293.6  end
'Fe-58      262   0  1.15406E-07  293.6  end
'Cu-63      262   0  1.91542E-05  293.6  end
'Cu-65      262   0  8.53729E-06  293.6  end
 U-234      262   0  2.69313E-06  293.6  end
 U-235      262   0  2.65478E-04  293.6  end
 U-236      262   0  1.07726E-06  293.6  end
 U-238      262   0  1.45429E-05  293.6  end
 Pu-239     262  0  5.98421E-07 300 end
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Pu-240      262  0  3.13646E-08 300 end
'     total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1        263   0   3.32435E-02   293.6   end
' B-10      263   0   1.46911E-05   293.6   end
' B-11      263   0   5.95139E-05   293.6   end
 O-16       263   0   1.74543E-02   293.6   end
'Mg-24      263   0   1.05686E-04   293.6   end
'Mg-25      263   0   1.33797E-05   293.6   end
'Mg-26      263   0   1.47310E-05   293.6   end
Al-27       263   0   2.86541E-02   293.6   end
'Si-28      263   0   1.01874E-04   293.6   end
'Si-29      263   0   5.15831E-06   293.6   end
'Si-30      263   0   3.42415E-06   293.6   end
'Ti-46      263   0   4.20263E-07   293.6   end
'Ti-47      263   0   3.79001E-07   293.6   end
'Ti-48      263   0   3.75537E-06   293.6   end
'Ti-49      263   0   2.75590E-07   293.6   end
'Ti-50      263   0   2.63873E-07   293.6   end
'Cr-50      263   0   5.30518E-07   293.6   end
'Cr-52      263   0   1.02189E-05   293.6   end
'Cr-53      263   0   1.15860E-06   293.6   end
'Cr-54      263   0   2.87821E-07   293.6   end
'Mn-55      263   0   6.53464E-06   293.6   end
'Fe-54      263   0   2.39803E-06   293.6   end
'Fe-56      263   0   3.76103E-05   293.6   end
'Fe-57      263   0   8.69031E-07   293.6   end
'Fe-58      263   0   1.14778E-07   293.6   end
'Cu-63      263   0   1.90782E-05   293.6   end
'Cu-65      263   0   8.50342E-06   293.6   end
 U-234      263   0   3.25215E-06   293.6   end
 U-235      263   0   3.17578E-04   293.6   end
 U-236      263   0   1.30087E-06   293.6   end
 U-238      263   0   1.75616E-05   293.6   end
 Pu-239     263  0  5.98421E-07 300 end
Pu-240      263  0  3.13646E-08 300 end
'     total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1        264   0   3.32434E-02   293.6   end
' B-10      264   0   1.03798E-05   293.6   end
' B-11      264   0   4.20486E-05   293.6   end
 O-16       264   0   1.76644E-02   293.6   end
'Mg-24      264   0   1.05686E-04   293.6   end
'Mg-25      264   0   1.33797E-05   293.6   end
'Mg-26      264   0   1.47310E-05   293.6   end
Al-27       264   0   2.83940E-02   293.6   end
'Si-28      264   0   1.01293E-04   293.6   end
'Si-29      264   0   5.12887E-06   293.6   end
'Si-30      264   0   3.40461E-06   293.6   end
'Ti-46      264   0   4.20262E-07   293.6   end
'Ti-47      264   0   3.79000E-07   293.6   end
'Ti-48      264   0   3.75536E-06   293.6   end
'Ti-49      264   0   2.75590E-07   293.6   end
'Ti-50      264   0   2.63873E-07   293.6   end
'Cr-50      264   0   5.30517E-07   293.6   end
'Cr-52      264   0   1.02189E-05   293.6   end
'Cr-53      264   0   1.15860E-06   293.6   end
'Cr-54      264   0   2.87821E-07   293.6   end
'Mn-55      264   0   6.50246E-06   293.6   end
'Fe-54      264   0   2.37952E-06   293.6   end
'Fe-56      264   0   3.73198E-05   293.6   end
'Fe-57      264   0   8.62321E-07   293.6   end
'Fe-58      264   0   1.13891E-07   293.6   end
'Cu-63      264   0   1.89710E-05   293.6   end
'Cu-65      264   0   8.45562E-06   293.6   end
 U-234      264   0   4.03970E-06   293.6   end
 U-235      264   0   3.90978E-04   293.6   end
 U-236      264   0   1.61589E-06   293.6   end
 U-238      264   0   2.18144E-05   293.6   end
 Pu-239     264  0  5.98421E-07 300 end
Pu-240      264  0  3.13646E-08 300 end
'     total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1        265   0   3.32434E-02   293.6   end
' B-10      265   0   6.18010E-06   293.6   end
' B-11      265   0   2.50356E-05   293.6   end
 O-16       265   0   1.78689E-02   293.6   end
'Mg-24      265   0   1.05686E-04   293.6   end
'Mg-25      265   0   1.33797E-05   293.6   end
'Mg-26      265   0   1.47310E-05   293.6   end
Al-27       265   0   2.81406E-02   293.6   end
'Si-28      265   0   1.00727E-04   293.6   end
'Si-29      265   0   5.10026E-06   293.6   end
'Si-30      265   0   3.38560E-06   293.6   end
'Ti-46      265   0   4.20262E-07   293.6   end
'Ti-47      265   0   3.79000E-07   293.6   end
'Ti-48      265   0   3.75536E-06   293.6   end
'Ti-49      265   0   2.75590E-07   293.6   end
'Ti-50      265   0   2.63873E-07   293.6   end
'Cr-50      265   0   5.30518E-07   293.6   end
'Cr-52      265   0   1.02189E-05   293.6   end
'Cr-53      265   0   1.15860E-06   293.6   end
'Cr-54      265   0   2.87821E-07   293.6   end
'Mn-55      265   0   6.47114E-06   293.6   end
'Fe-54      265   0   2.36149E-06   293.6   end
'Fe-56      265   0   3.70370E-05   293.6   end
'Fe-57      265   0   8.55788E-07   293.6   end
'Fe-58      265   0   1.13028E-07   293.6   end
'Cu-63      265   0   1.88666E-05   293.6   end
'Cu-65      265   0   8.40911E-06   293.6   end
 U-234      265   0   4.80687E-06   293.6   end
 U-235      265   0   4.62478E-04   293.6   end
 U-236      265   0   1.92276E-06   293.6   end
 U-238      265   0   2.59571E-05   293.6   end
 Pu-239     265  0  5.98421E-07 300 end
Pu-240      265  0  3.13646E-08 300 end
'     total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1        266   0   3.32434E-02   293.6   end
' B-10      266   0   5.79830E-06   293.6   end
' B-11      266   0   2.34889E-05   293.6   end
 O-16       266   0   1.78875E-02   293.6   end
'Mg-24      266   0   1.05686E-04   293.6   end
'Mg-25      266   0   1.33797E-05   293.6   end
'Mg-26      266   0   1.47310E-05   293.6   end
Al-27       266   0   2.81176E-02   293.6   end
'Si-28      266   0   1.00676E-04   293.6   end
'Si-29      266   0   5.09768E-06   293.6   end
'Si-30      266   0   3.38390E-06   293.6   end
'Ti-46      266   0   4.20262E-07   293.6   end
'Ti-47      266   0   3.79000E-07   293.6   end
'Ti-48      266   0   3.75536E-06   293.6   end
'Ti-49      266   0   2.75590E-07   293.6   end
'Ti-50      266   0   2.63873E-07   293.6   end
'Cr-50      266   0   5.30517E-07   293.6   end
'Cr-52      266   0   1.02189E-05   293.6   end
'Cr-53      266   0   1.15860E-06   293.6   end
'Cr-54      266   0   2.87821E-07   293.6   end
'Mn-55      266   0   6.46828E-06   293.6   end
'Fe-54      266   0   2.35985E-06   293.6   end
'Fe-56      266   0   3.70113E-05   293.6   end
'Fe-57      266   0   8.55193E-07   293.6   end
'Fe-58      266   0   1.12950E-07   293.6   end
'Cu-63      266   0   1.88571E-05   293.6   end
'Cu-65      266   0   8.40487E-06   293.6   end
 U-234      266   0   4.87661E-06   293.6   end
 U-235      266   0   4.68978E-04   293.6   end
 U-236      266   0   1.95066E-06   293.6   end
 U-238      266   0   2.63337E-05   293.6   end
 Pu-239     266  0  5.98421E-07 300 end
Pu-240      266  0  3.13646E-08 300 end
'     total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1        267   0   3.32434E-02   293.6   end
' B-10      267   0   7.99507E-06   293.6   end
' B-11      267   0   3.23880E-05   293.6   end
 O-16       267   0   1.77805E-02   293.6   end
'Mg-24      267   0   1.05686E-04   293.6   end
'Mg-25      267   0   1.33797E-05   293.6   end
'Mg-26      267   0   1.47310E-05   293.6   end
Al-27       267   0   2.82501E-02   293.6   end
'Si-28      267   0   1.00972E-04   293.6   end
'Si-29      267   0   5.11262E-06   293.6   end
'Si-30      267   0   3.39382E-06   293.6   end
'Ti-46      267   0   4.20262E-07   293.6   end
'Ti-47      267   0   3.79000E-07   293.6   end
'Ti-48      267   0   3.75536E-06   293.6   end
'Ti-49      267   0   2.75590E-07   293.6   end
'Ti-50      267   0   2.63873E-07   293.6   end
'Cr-50      267   0   5.30517E-07   293.6   end
'Cr-52      267   0   1.02189E-05   293.6   end
'Cr-53      267   0   1.15860E-06   293.6   end
'Cr-54      267   0   2.87821E-07   293.6   end
'Mn-55      267   0   6.48467E-06   293.6   end
'Fe-54      267   0   2.36928E-06   293.6   end
'Fe-56      267   0   3.71592E-05   293.6   end
'Fe-57      267   0   8.58611E-07   293.6   end
'Fe-58      267   0   1.13401E-07   293.6   end
'Cu-63      267   0   1.89118E-05   293.6   end
'Cu-65      267   0   8.42923E-06   293.6   end
 U-234      267   0   4.47532E-06   293.6   end
 U-235      267   0   4.31578E-04   293.6   end
 U-236      267   0   1.79014E-06   293.6   end
 U-238      267   0   2.41667E-05   293.6   end
 Pu-239     267  0  5.98421E-07 300 end
Pu-240      267  0  3.13646E-08 300 end
'     total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1        268   0   3.32434E-02   293.6   end
' B-10      268   0   1.06559E-05   293.6   end
' B-11      268   0   4.31670E-05   293.6   end
 O-16       268   0   1.76509E-02   293.6   end
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'Mg-24      268   0  1.05686E-04  293.6  end
'Mg-25      268   0  1.33797E-05  293.6  end
'Mg-26      268   0  1.47310E-05  293.6  end
Al-27       268   0  2.84107E-02  293.6  end
'Si-28      268   0  1.01330E-04  293.6  end
'Si-29      268   0  5.13079E-06  293.6  end
'Si-30      268   0  3.40588E-06  293.6  end
'Ti-46      268   0  4.20262E-07  293.6  end
'Ti-47      268   0  3.79000E-07  293.6  end
'Ti-48      268   0  3.75536E-06  293.6  end
'Ti-49      268   0  2.75590E-07  293.6  end
'Ti-50      268   0  2.63873E-07  293.6  end
'Cr-50      268   0  5.30517E-07  293.6  end
'Cr-52      268   0  1.02189E-05  293.6  end
'Cr-53      268   0  1.15860E-06  293.6  end
'Cr-54      268   0  2.87821E-07  293.6  end
'Mn-55      268   0  6.50452E-06  293.6  end
'Fe-54      268   0  2.38070E-06  293.6  end
'Fe-56      268   0  3.73384E-05  293.6  end
'Fe-57      268   0  8.62751E-07  293.6  end
'Fe-58      268   0  1.13948E-07  293.6  end
'Cu-63      268   0  1.89779E-05  293.6  end
'Cu-65      268   0  8.45870E-06  293.6  end
 U-234      268   0  3.98927E-06  293.6  end
 U-235      268   0  3.86278E-04  293.6  end
 U-236      268   0  1.59572E-06  293.6  end
 U-238      268   0  2.15420E-05  293.6  end
 Pu-239     268  0  5.98421E-07 300 end
Pu-240      268  0  3.13646E-08 300 end
'
'        Inner fuel element--fueled Axial region 7
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1        271   0  3.32434E-02  293.6  end
' B-10       271   0  2.04121E-05  293.6  end
' B-11       271   0  8.26896E-05  293.6  end
 O-16       271   0  1.71757E-02  293.6  end
'Mg-24      271   0  1.05686E-04  293.6  end
'Mg-25      271   0  1.33797E-05  293.6  end
'Mg-26      271   0  1.47310E-05  293.6  end
Al-27       271   0  2.89993E-02  293.6  end
'Si-28      271   0  1.02644E-04  293.6  end
'Si-29      271   0  5.19729E-06  293.6  end
'Si-30      271   0  3.45002E-06  293.6  end
'Ti-46      271   0  4.20262E-07  293.6  end
'Ti-47      271   0  3.79000E-07  293.6  end
'Ti-48      271   0  3.75536E-06  293.6  end
'Ti-49      271   0  2.75590E-07  293.6  end
'Ti-50      271   0  2.63873E-07  293.6  end
'Cr-50      271   0  5.30517E-07  293.6  end
'Cr-52      271   0  1.02189E-05  293.6  end
'Cr-53      271   0  1.15860E-06  293.6  end
'Cr-54      271   0  2.87821E-07  293.6  end
'Mn-55      271   0  6.57731E-06  293.6  end
'Fe-54      271   0  2.42259E-06  293.6  end
'Fe-56      271   0  3.79953E-05  293.6  end
'Fe-57      271   0  8.77930E-07  293.6  end
'Fe-58      271   0  1.15953E-07  293.6  end
'Cu-63      271   0  1.92203E-05  293.6  end
'Cu-65      271   0  8.56676E-06  293.6  end
 U-234      271   0  2.20708E-06  293.6  end
 U-235      271   0  2.20178E-04  293.6  end
 U-236      271   0  8.82838E-07  293.6  end
 U-238      271   0  1.19182E-05  293.6  end
 Pu-239     271  0  5.98421E-07 300 end
Pu-240      271  0  3.13646E-08 300 end
'      total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1        272   0  3.32434E-02  293.6  end
' B-10       272   0  1.77513E-05  293.6  end
' B-11       272   0  7.19107E-05  293.6  end
 O-16       272   0  1.73053E-02  293.6  end
'Mg-24      272   0  1.05686E-04  293.6  end
'Mg-25      272   0  1.33797E-05  293.6  end
'Mg-26      272   0  1.47310E-05  293.6  end
Al-27       272   0  2.88388E-02  293.6  end
'Si-28      272   0  1.02285E-04  293.6  end
'Si-29      272   0  5.17912E-06  293.6  end
'Si-30      272   0  3.43796E-06  293.6  end
'Ti-46      272   0  4.20262E-07  293.6  end
'Ti-47      272   0  3.79000E-07  293.6  end
'Ti-48      272   0  3.75536E-06  293.6  end
'Ti-49      272   0  2.75590E-07  293.6  end
'Ti-50      272   0  2.63873E-07  293.6  end
'Cr-50      272   0  5.30517E-07  293.6  end
'Cr-52      272   0  1.02189E-05  293.6  end
'Cr-53      272   0  1.15860E-06  293.6  end
'Cr-54      272   0  2.87821E-07  293.6  end
'Mn-55      272   0  6.55746E-06  293.6  end
'Fe-54      272   0  2.41117E-06  293.6  end
'Fe-56      272   0  3.78162E-05  293.6  end
'Fe-57      272   0  8.73792E-07  293.6  end
'Fe-58      272   0  1.15406E-07  293.6  end
'Cu-63      272   0  1.91542E-05  293.6  end
'Cu-65      272   0  8.53729E-06  293.6  end
 U-234      272   0  2.69313E-06  293.6  end
 U-235      272   0  2.65478E-04  293.6  end
 U-236      272   0  1.07726E-06  293.6  end
 U-238      272   0  1.45429E-05  293.6  end
 Pu-239     272  0  5.98421E-07 300 end
Pu-240      272  0  3.13646E-08 300 end
'      total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1        273   0  3.32435E-02  293.6  end
' B-10       273   0  1.46911E-05  293.6  end
' B-11       273   0  5.95139E-05  293.6  end
 O-16       273   0  1.74543E-02  293.6  end
'Mg-24      273   0  1.05686E-04  293.6  end
'Mg-25      273   0  1.33797E-05  293.6  end
'Mg-26      273   0  1.47310E-05  293.6  end
Al-27       273   0  2.86541E-02  293.6  end
'Si-28      273   0  1.01874E-04  293.6  end
'Si-29      273   0  5.15831E-06  293.6  end
'Si-30      273   0  3.42415E-06  293.6  end
'Ti-46      273   0  4.20263E-07  293.6  end
'Ti-47      273   0  3.79001E-07  293.6  end
'Ti-48      273   0  3.75537E-06  293.6  end
'Ti-49      273   0  2.75590E-07  293.6  end
'Ti-50      273   0  2.63873E-07  293.6  end
'Cr-50      273   0  5.30518E-07  293.6  end
'Cr-52      273   0  1.02189E-05  293.6  end
'Cr-53      273   0  1.15860E-06  293.6  end
'Cr-54      273   0  2.87821E-07  293.6  end
'Mn-55      273   0  6.53464E-06  293.6  end
'Fe-54      273   0  2.39803E-06  293.6  end
'Fe-56      273   0  3.76103E-05  293.6  end
'Fe-57      273   0  8.69031E-07  293.6  end
'Fe-58      273   0  1.14778E-07  293.6  end
'Cu-63      273   0  1.90782E-05  293.6  end
'Cu-65      273   0  8.50342E-06  293.6  end
 U-234      273   0  3.25215E-06  293.6  end
 U-235      273   0  3.17578E-04  293.6  end
 U-236      273   0  1.30087E-06  293.6  end
 U-238      273   0  1.75616E-05  293.6  end
 Pu-239     273  0  5.98421E-07 300 end
Pu-240      273  0  3.13646E-08 300 end
'      total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1        274   0  3.32434E-02  293.6  end
' B-10       274   0  1.03798E-05  293.6  end
' B-11       274   0  4.20486E-05  293.6  end
 O-16       274   0  1.76644E-02  293.6  end
'Mg-24      274   0  1.05686E-04  293.6  end
'Mg-25      274   0  1.33797E-05  293.6  end
'Mg-26      274   0  1.47310E-05  293.6  end
Al-27       274   0  2.83940E-02  293.6  end
'Si-28      274   0  1.01293E-04  293.6  end
'Si-29      274   0  5.12887E-06  293.6  end
'Si-30      274   0  3.40461E-06  293.6  end
'Ti-46      274   0  4.20262E-07  293.6  end
'Ti-47      274   0  3.79000E-07  293.6  end
'Ti-48      274   0  3.75536E-06  293.6  end
'Ti-49      274   0  2.75590E-07  293.6  end
'Ti-50      274   0  2.63873E-07  293.6  end
'Cr-50      274   0  5.30517E-07  293.6  end
'Cr-52      274   0  1.02189E-05  293.6  end
'Cr-53      274   0  1.15860E-06  293.6  end
'Cr-54      274   0  2.87821E-07  293.6  end
'Mn-55      274   0  6.50246E-06  293.6  end
'Fe-54      274   0  2.37952E-06  293.6  end
'Fe-56      274   0  3.73198E-05  293.6  end
'Fe-57      274   0  8.62321E-07  293.6  end
'Fe-58      274   0  1.13891E-07  293.6  end
'Cu-63      274   0  1.89710E-05  293.6  end
'Cu-65      274   0  8.45562E-06  293.6  end
 U-234      274   0  4.03970E-06  293.6  end
 U-235      274   0  3.90978E-04  293.6  end
 U-236      274   0  1.61589E-06  293.6  end
 U-238      274   0  2.18144E-05  293.6  end
 Pu-239     274  0  5.98421E-07 300 end
Pu-240      274  0  3.13646E-08 300 end
'      total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1        275   0  3.32434E-02  293.6  end
' B-10       275   0  6.18010E-06  293.6  end
' B-11       275   0  2.50356E-05  293.6  end
 O-16       275   0  1.78689E-02  293.6  end
'Mg-24      275   0  1.05686E-04  293.6  end
'Mg-25      275   0  1.33797E-05  293.6  end
'Mg-26      275   0  1.47310E-05  293.6  end
Al-27       275   0  2.81406E-02  293.6  end
'Si-28      275   0  1.00727E-04  293.6  end
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'Si-29          275    0   5.10026E-06   293.6   end
'Si-30          275    0   3.38560E-06   293.6   end
'Ti-46          275    0   4.20262E-07   293.6   end
'Ti-47          275    0   3.79000E-07   293.6   end
'Ti-48          275    0   3.75536E-06   293.6   end
'Ti-49          275    0   2.75590E-07   293.6   end
'Ti-50          275    0   2.63873E-07   293.6   end
'Cr-50          275    0   5.30518E-07   293.6   end
'Cr-52          275    0   1.02189E-05   293.6   end
'Cr-53          275    0   1.15860E-06   293.6   end
'Cr-54          275    0   2.87821E-07   293.6   end
'Mn-55          275    0   6.47114E-06   293.6   end
'Fe-54          275    0   2.36149E-06   293.6   end
'Fe-56          275    0   3.70370E-05   293.6   end
'Fe-57          275    0   8.55788E-07   293.6   end
'Fe-58          275    0   1.13028E-07   293.6   end
'Cu-63          275    0   1.88666E-05   293.6   end
'Cu-65          275    0   8.40911E-06   293.6   end
 U-234          275    0   4.80687E-06   293.6   end
 U-235          275    0   4.62478E-04   293.6   end
 U-236          275    0   1.92276E-06   293.6   end
 U-238          275    0   2.59571E-05   293.6   end
 Pu-239         275  0  5.98421E-07 300 end
Pu-240          275  0  3.13646E-08 300 end
'       total atom density =  8.00998E-02 a/b-cm
' 8.009980E-02
 H-1            276    0   3.32434E-02   293.6   end
' B-10           276    0   5.79830E-06   293.6   end
' B-11           276    0   2.34889E-05   293.6   end
 O-16           276    0   1.78875E-02   293.6   end
'Mg-24          276    0   1.05686E-04   293.6   end
'Mg-25          276    0   1.33797E-05   293.6   end
'Mg-26          276    0   1.47310E-05   293.6   end
Al-27           276    0   2.81176E-02   293.6   end
'Si-28          276    0   1.00676E-04   293.6   end
'Si-29          276    0   5.09768E-06   293.6   end
'Si-30          276    0   3.38390E-06   293.6   end
'Ti-46          276    0   4.20262E-07   293.6   end
'Ti-47          276    0   3.79000E-07   293.6   end
'Ti-48          276    0   3.75536E-06   293.6   end
'Ti-49          276    0   2.75590E-07   293.6   end
'Ti-50          276    0   2.63873E-07   293.6   end
'Cr-50          276    0   5.30517E-07   293.6   end
'Cr-52          276    0   1.02189E-05   293.6   end
'Cr-53          276    0   1.15860E-06   293.6   end
'Cr-54          276    0   2.87821E-07   293.6   end
'Mn-55          276    0   6.46828E-06   293.6   end
'Fe-54          276    0   2.35985E-06   293.6   end
'Fe-56          276    0   3.70113E-05   293.6   end
'Fe-57          276    0   8.55193E-07   293.6   end
'Fe-58          276    0   1.12950E-07   293.6   end
'Cu-63          276    0   1.88571E-05   293.6   end
'Cu-65          276    0   8.40487E-06   293.6   end
 U-234          276    0   4.87661E-06   293.6   end
 U-235          276    0   4.68978E-04   293.6   end
 U-236          276    0   1.95066E-06   293.6   end
 U-238          276  0  5.98421E-07 300 end
 Pu-239         276  0  5.98421E-07 300 end
Pu-240          276  0  3.13646E-08 300 end
'       total atom density =  8.00968E-02 a/b-cm
' 8.009680E-02
 H-1            277    0   3.32434E-02   293.6   end
' B-10           277    0   7.99507E-06   293.6   end
' B-11           277    0   3.23880E-05   293.6   end
 O-16           277    0   1.77805E-02   293.6   end
'Mg-24          277    0   1.05686E-04   293.6   end
'Mg-25          277    0   1.33797E-05   293.6   end
'Mg-26          277    0   1.47310E-05   293.6   end
Al-27           277    0   2.82501E-02   293.6   end
'Si-28          277    0   1.00972E-04   293.6   end
'Si-29          277    0   5.11262E-06   293.6   end
'Si-30          277    0   3.39382E-06   293.6   end
'Ti-46          277    0   4.20262E-07   293.6   end
'Ti-47          277    0   3.79000E-07   293.6   end
'Ti-48          277    0   3.75536E-06   293.6   end
'Ti-49          277    0   2.75590E-07   293.6   end
'Ti-50          277    0   2.63873E-07   293.6   end
'Cr-50          277    0   5.30517E-07   293.6   end
'Cr-52          277    0   1.02189E-05   293.6   end
'Cr-53          277    0   1.15860E-06   293.6   end
'Cr-54          277    0   2.87821E-07   293.6   end
'Mn-55          277    0   6.48467E-06   293.6   end
'Fe-54          277    0   2.36928E-06   293.6   end
'Fe-56          277    0   3.71592E-05   293.6   end
'Fe-57          277    0   8.58611E-07   293.6   end
'Fe-58          277    0   1.13401E-07   293.6   end
'Cu-63          277    0   1.89118E-05   293.6   end
'Cu-65          277    0   8.42923E-06   293.6   end
 U-234          277    0   4.47532E-06   293.6   end
 U-235          277    0   4.31578E-04   293.6   end
 U-236          277    0   1.79014E-06   293.6   end
 U-238          277    0   2.41667E-05   293.6   end
 Pu-239         277  0  5.98421E-07 300 end
Pu-240          277  0  3.13646E-08 300 end
'       total atom density =  8.00933E-02 a/b-cm
' 8.009330E-02
 H-1            278    0   3.32434E-02   293.6   end
' B-10           278    0   1.06559E-05   293.6   end
' B-11           278    0   4.31670E-05   293.6   end
 O-16           278    0   1.76509E-02   293.6   end
'Mg-24          278    0   1.05686E-04   293.6   end
'Mg-25          278    0   1.33797E-05   293.6   end
'Mg-26          278    0   1.47310E-05   293.6   end
Al-27           278    0   2.84107E-02   293.6   end
'Si-28          278    0   1.01330E-04   293.6   end
'Si-29          278    0   5.13079E-06   293.6   end
'Si-30          278    0   3.40588E-06   293.6   end
'Ti-46          278    0   4.20262E-07   293.6   end
'Ti-47          278    0   3.79000E-07   293.6   end
'Ti-48          278    0   3.75536E-06   293.6   end
'Ti-49          278    0   2.75590E-07   293.6   end
'Ti-50          278    0   2.63873E-07   293.6   end
'Cr-50          278    0   5.30517E-07   293.6   end
'Cr-52          278    0   1.02189E-05   293.6   end
'Cr-53          278    0   1.15860E-06   293.6   end
'Cr-54          278    0   2.87821E-07   293.6   end
'Mn-55          278    0   6.50452E-06   293.6   end
'Fe-54          278    0   2.38070E-06   293.6   end
'Fe-56          278    0   3.73384E-05   293.6   end
'Fe-57          278    0   8.62751E-07   293.6   end
'Fe-58          278    0   1.13948E-07   293.6   end
'Cu-63          278    0   1.89779E-05   293.6   end
'Cu-65          278    0   8.45870E-06   293.6   end
 U-234          278    0   3.98927E-06   293.6   end
 U-235          278    0   3.86278E-04   293.6   end
 U-236          278    0   1.59572E-06   293.6   end
 U-238          278    0   2.15420E-05   293.6   end
 Pu-239         278  0  5.98421E-07 300 end
Pu-240          278  0  3.13646E-08 300 end
'
'       Inner fuel element--fueled Axial region 8
'       total atom density =  8.00804E-02 a/b-cm
' 8.008040E-02
 H-1            281    0   3.32434E-02   293.6   end
' B-10           281    0   2.04121E-05   293.6   end
' B-11           281    0   8.26896E-05   293.6   end
 O-16           281    0   1.71757E-02   293.6   end
'Mg-24          281    0   1.05686E-04   293.6   end
'Mg-25          281    0   1.33797E-05   293.6   end
'Mg-26          281    0   1.47310E-05   293.6   end
Al-27           281    0   2.89993E-02   293.6   end
'Si-28          281    0   1.02644E-04   293.6   end
'Si-29          281    0   5.19729E-06   293.6   end
'Si-30          281    0   3.45002E-06   293.6   end
'Ti-46          281    0   4.20262E-07   293.6   end
'Ti-47          281    0   3.79000E-07   293.6   end
'Ti-48          281    0   3.75536E-06   293.6   end
'Ti-49          281    0   2.75590E-07   293.6   end
'Ti-50          281    0   2.63873E-07   293.6   end
'Cr-50          281    0   5.30517E-07   293.6   end
'Cr-52          281    0   1.02189E-05   293.6   end
'Cr-53          281    0   1.15860E-06   293.6   end
'Cr-54          281    0   2.87821E-07   293.6   end
'Mn-55          281    0   6.57731E-06   293.6   end
'Fe-54          281    0   2.42259E-06   293.6   end
'Fe-56          281    0   3.79953E-05   293.6   end
'Fe-57          281    0   8.77930E-07   293.6   end
'Fe-58          281    0   1.15953E-07   293.6   end
'Cu-63          281    0   1.92203E-05   293.6   end
'Cu-65          281    0   8.56676E-06   293.6   end
 U-234          281    0   2.20708E-06   293.6   end
 U-235          281    0   2.20178E-04   293.6   end
 U-236          281    0   8.82838E-07   293.6   end
 U-238          281    0   1.19182E-05   293.6   end
 Pu-239         281  0  5.98421E-07 300 end
Pu-240          281  0  3.13646E-08 300 end
'       total atom density =  8.00839E-02 a/b-cm
' 8.008390E-02
 H-1            282    0   3.32434E-02   293.6   end
' B-10           282    0   1.77513E-05   293.6   end
' B-11           282    0   7.19107E-05   293.6   end
 O-16           282    0   1.73053E-02   293.6   end
'Mg-24          282    0   1.05686E-04   293.6   end
'Mg-25          282    0   1.33797E-05   293.6   end
'Mg-26          282    0   1.47310E-05   293.6   end
Al-27           282    0   2.88388E-02   293.6   end
'Si-28          282    0   1.02285E-04   293.6   end
'Si-29          282    0   5.17912E-06   293.6   end
'Si-30          282    0   3.43796E-06   293.6   end
'Ti-46          282    0   4.20262E-07   293.6   end
'Ti-47          282    0   3.79000E-07   293.6   end
'Ti-48          282    0   3.75536E-06   293.6   end
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'Ti-49          282    0   2.75590E-07   293.6   end
'Ti-50          282    0   2.63873E-07   293.6   end
'Cr-50          282    0   5.30517E-07   293.6   end
'Cr-52          282    0   1.02189E-05   293.6   end
'Cr-53          282    0   1.15860E-06   293.6   end
'Cr-54          282    0   2.87821E-07   293.6   end
'Mn-55          282    0   6.55746E-06   293.6   end
'Fe-54          282    0   2.41117E-06   293.6   end
'Fe-56          282    0   3.78162E-05   293.6   end
'Fe-57          282    0   8.73792E-07   293.6   end
'Fe-58          282    0   1.15406E-07   293.6   end
'Cu-63          282    0   1.91542E-05   293.6   end
'Cu-65          282    0   8.53729E-06   293.6   end
 U-234          282    0   2.69313E-06   293.6   end
 U-235          282    0   2.65478E-04   293.6   end
 U-236          282    0   1.07726E-06   293.6   end
 U-238          282    0   1.45429E-05   293.6   end
 Pu-239         282  0  5.98421E-07 300 end
Pu-240          282  0  3.13646E-08 300 end
'       total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1            283    0   3.32435E-02   293.6   end
' B-10          283    0   1.46911E-05   293.6   end
' B-11          283    0   5.95139E-05   293.6   end
 O-16           283    0   1.74543E-02   293.6   end
'Mg-24          283    0   1.05686E-04   293.6   end
'Mg-25          283    0   1.33797E-05   293.6   end
'Mg-26          283    0   1.47310E-05   293.6   end
Al-27           283    0   2.86541E-02   293.6   end
'Si-28          283    0   1.01874E-04   293.6   end
'Si-29          283    0   5.15831E-06   293.6   end
'Si-30          283    0   3.42415E-06   293.6   end
'Ti-46          283    0   4.20263E-07   293.6   end
'Ti-47          283    0   3.79001E-07   293.6   end
'Ti-48          283    0   3.75537E-06   293.6   end
'Ti-49          283    0   2.75590E-07   293.6   end
'Ti-50          283    0   2.63873E-07   293.6   end
'Cr-50          283    0   5.30518E-07   293.6   end
'Cr-52          283    0   1.02189E-05   293.6   end
'Cr-53          283    0   1.15860E-06   293.6   end
'Cr-54          283    0   2.87821E-07   293.6   end
'Mn-55          283    0   6.53464E-06   293.6   end
'Fe-54          283    0   2.39803E-06   293.6   end
'Fe-56          283    0   3.76103E-05   293.6   end
'Fe-57          283    0   8.69031E-07   293.6   end
'Fe-58          283    0   1.14778E-07   293.6   end
'Cu-63          283    0   1.90782E-05   293.6   end
'Cu-65          283    0   8.50342E-06   293.6   end
 U-234          283    0   3.25215E-06   293.6   end
 U-235          283    0   3.17578E-04   293.6   end
 U-236          283    0   1.30087E-06   293.6   end
 U-238          283    0   1.75616E-05   293.6   end
 Pu-239         283  0  5.98421E-07 300 end
Pu-240          283  0  3.13646E-08 300 end
'       total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1            284    0   3.32434E-02   293.6   end
' B-10          284    0   1.03798E-05   293.6   end
' B-11          284    0   4.20486E-05   293.6   end
 O-16           284    0   1.76644E-02   293.6   end
'Mg-24          284    0   1.05686E-04   293.6   end
'Mg-25          284    0   1.33797E-05   293.6   end
'Mg-26          284    0   1.47310E-05   293.6   end
Al-27           284    0   2.83940E-02   293.6   end
'Si-28          284    0   1.01293E-04   293.6   end
'Si-29          284    0   5.12887E-06   293.6   end
'Si-30          284    0   3.40461E-06   293.6   end
'Ti-46          284    0   4.20262E-07   293.6   end
'Ti-47          284    0   3.79000E-07   293.6   end
'Ti-48          284    0   3.75536E-06   293.6   end
'Ti-49          284    0   2.75590E-07   293.6   end
'Ti-50          284    0   2.63873E-07   293.6   end
'Cr-50          284    0   5.30517E-07   293.6   end
'Cr-52          284    0   1.02189E-05   293.6   end
'Cr-53          284    0   1.15860E-06   293.6   end
'Cr-54          284    0   2.87821E-07   293.6   end
'Mn-55          284    0   6.50246E-06   293.6   end
'Fe-54          284    0   2.37952E-06   293.6   end
'Fe-56          284    0   3.73198E-05   293.6   end
'Fe-57          284    0   8.62321E-07   293.6   end
'Fe-58          284    0   1.13891E-07   293.6   end
'Cu-63          284    0   1.89710E-05   293.6   end
'Cu-65          284    0   8.45562E-06   293.6   end
 U-234          284    0   4.03970E-06   293.6   end
 U-235          284    0   3.90978E-04   293.6   end
 U-236          284    0   1.61589E-06   293.6   end
 U-238          284    0   2.18144E-05   293.6   end
 Pu-239         284  0  5.98421E-07 300 end
Pu-240          284  0  3.13646E-08 300 end
'       total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1            285    0   3.32434E-02   293.6   end
' B-10          285    0   6.18010E-06   293.6   end
' B-11          285    0   2.50356E-05   293.6   end
 O-16           285    0   1.78689E-02   293.6   end
'Mg-24          285    0   1.05686E-04   293.6   end
'Mg-25          285    0   1.33797E-05   293.6   end
'Mg-26          285    0   1.47310E-05   293.6   end
Al-27           285    0   2.81406E-02   293.6   end
'Si-28          285    0   1.00727E-04   293.6   end
'Si-29          285    0   5.10026E-06   293.6   end
'Si-30          285    0   3.38560E-06   293.6   end
'Ti-46          285    0   4.20262E-07   293.6   end
'Ti-47          285    0   3.79000E-07   293.6   end
'Ti-48          285    0   3.75536E-06   293.6   end
'Ti-49          285    0   2.75590E-07   293.6   end
'Ti-50          285    0   2.63873E-07   293.6   end
'Cr-50          285    0   5.30518E-07   293.6   end
'Cr-52          285    0   1.02189E-05   293.6   end
'Cr-53          285    0   1.15860E-06   293.6   end
'Cr-54          285    0   2.87821E-07   293.6   end
'Mn-55          285    0   6.47114E-06   293.6   end
'Fe-54          285    0   2.36149E-06   293.6   end
'Fe-56          285    0   3.70370E-05   293.6   end
'Fe-57          285    0   8.55788E-07   293.6   end
'Fe-58          285    0   1.13028E-07   293.6   end
'Cu-63          285    0   1.88666E-05   293.6   end
'Cu-65          285    0   8.40911E-06   293.6   end
 U-234          285    0   4.80687E-06   293.6   end
 U-235          285    0   4.62478E-04   293.6   end
 U-236          285    0   1.92276E-06   293.6   end
 U-238          285    0   2.59571E-05   293.6   end
 Pu-239         285  0  5.98421E-07 300 end
Pu-240          285  0  3.13646E-08 300 end
'       total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1            286    0   3.32434E-02   293.6   end
' B-10          286    0   5.79830E-06   293.6   end
' B-11          286    0   2.34889E-05   293.6   end
 O-16           286    0   1.78875E-02   293.6   end
'Mg-24          286    0   1.05686E-04   293.6   end
'Mg-25          286    0   1.33797E-05   293.6   end
'Mg-26          286    0   1.47310E-05   293.6   end
Al-27           286    0   2.81176E-02   293.6   end
'Si-28          286    0   1.00676E-04   293.6   end
'Si-29          286    0   5.09768E-06   293.6   end
'Si-30          286    0   3.38390E-06   293.6   end
'Ti-46          286    0   4.20262E-07   293.6   end
'Ti-47          286    0   3.79000E-07   293.6   end
'Ti-48          286    0   3.75536E-06   293.6   end
'Ti-49          286    0   2.75590E-07   293.6   end
'Ti-50          286    0   2.63873E-07   293.6   end
'Cr-50          286    0   5.30517E-07   293.6   end
'Cr-52          286    0   1.02189E-05   293.6   end
'Cr-53          286    0   1.15860E-06   293.6   end
'Cr-54          286    0   2.87821E-07   293.6   end
'Mn-55          286    0   6.46828E-06   293.6   end
'Fe-54          286    0   2.35985E-06   293.6   end
'Fe-56          286    0   3.70113E-05   293.6   end
'Fe-57          286    0   8.55193E-07   293.6   end
'Fe-58          286    0   1.12950E-07   293.6   end
'Cu-63          286    0   1.88571E-05   293.6   end
'Cu-65          286    0   8.40487E-06   293.6   end
 U-234          286    0   4.87661E-06   293.6   end
 U-235          286    0   4.68978E-04   293.6   end
 U-236          286    0   1.95066E-06   293.6   end
 U-238          286    0   2.63337E-05   293.6   end
 Pu-239         286  0  5.98421E-07 300 end
Pu-240          286  0  3.13646E-08 300 end
'       total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1            287    0   3.32434E-02   293.6   end
' B-10          287    0   7.99507E-06   293.6   end
' B-11          287    0   3.23880E-05   293.6   end
 O-16           287    0   1.77805E-02   293.6   end
'Mg-24          287    0   1.05686E-04   293.6   end
'Mg-25          287    0   1.33797E-05   293.6   end
'Mg-26          287    0   1.47310E-05   293.6   end
Al-27           287    0   2.82501E-02   293.6   end
'Si-28          287    0   1.00972E-04   293.6   end
'Si-29          287    0   5.11262E-06   293.6   end
'Si-30          287    0   3.39382E-06   293.6   end
'Ti-46          287    0   4.20262E-07   293.6   end
'Ti-47          287    0   3.79000E-07   293.6   end
'Ti-48          287    0   3.75536E-06   293.6   end
'Ti-49          287    0   2.75590E-07   293.6   end
'Ti-50          287    0   2.63873E-07   293.6   end
'Cr-50          287    0   5.30517E-07   293.6   end
'Cr-52          287    0   1.02189E-05   293.6   end
'Cr-53          287    0   1.15860E-06   293.6   end
'Cr-54          287    0   2.87821E-07   293.6   end
'Mn-55          287    0   6.48467E-06   293.6   end
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'Fe-54        287   0  2.36928E-06  293.6  end
'Fe-56        287   0  3.71592E-05  293.6  end
'Fe-57        287   0  8.58611E-07  293.6  end
'Fe-58        287   0  1.13401E-07  293.6  end
'Cu-63        287   0  1.89118E-05  293.6  end
'Cu-65        287   0  8.42923E-06  293.6  end
 U-234        287   0  4.47532E-06  293.6  end
 U-235        287   0  4.31578E-04  293.6  end
 U-236        287   0  1.79014E-06  293.6  end
 U-238        287   0  2.41667E-05  293.6  end
 Pu-239       287  0  5.98421E-07 300 end
Pu-240        287  0  3.13646E-08 300 end
'      total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1          288   0  3.32434E-02  293.6  end
' B-10         288   0  1.06559E-05  293.6  end
' B-11         288   0  4.31670E-05  293.6  end
 O-16          288   0  1.76509E-02  293.6  end
'Mg-24         288   0  1.05686E-04  293.6  end
'Mg-25         288   0  1.33797E-05  293.6  end
'Mg-26         288   0  1.47310E-05  293.6  end
Al-27          288   0  2.84107E-02  293.6  end
'Si-28         288   0  1.01330E-04  293.6  end
'Si-29         288   0  5.13079E-06  293.6  end
'Si-30         288   0  3.40588E-06  293.6  end
'Ti-46         288   0  4.20262E-07  293.6  end
'Ti-47         288   0  3.79000E-07  293.6  end
'Ti-48         288   0  3.75536E-06  293.6  end
'Ti-49         288   0  2.75590E-07  293.6  end
'Ti-50         288   0  2.63873E-07  293.6  end
'Cr-50         288   0  5.30517E-07  293.6  end
'Cr-52         288   0  1.02189E-05  293.6  end
'Cr-53         288   0  1.15860E-06  293.6  end
'Cr-54         288   0  2.87821E-07  293.6  end
'Mn-55         288   0  6.50452E-06  293.6  end
'Fe-54         288   0  2.38070E-06  293.6  end
'Fe-56         288   0  3.73384E-05  293.6  end
'Fe-57         288   0  8.62751E-07  293.6  end
'Fe-58         288   0  1.13948E-07  293.6  end
'Cu-63         288   0  1.89779E-05  293.6  end
'Cu-65         288   0  8.45870E-06  293.6  end
 U-234         288   0  3.98927E-06  293.6  end
 U-235         288   0  3.86278E-04  293.6  end
 U-236         288   0  1.59572E-06  293.6  end
 U-238         288   0  2.15420E-05  293.6  end
 Pu-239        288  0  5.98421E-07 300 end
Pu-240         288  0  3.13646E-08 300 end
'
'         Inner fuel element--fueled Axial region 9
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1          291   0  3.32434E-02  293.6  end
' B-10         291   0  2.04121E-05  293.6  end
' B-11         291   0  8.26896E-05  293.6  end
 O-16          291   0  1.71757E-02  293.6  end
'Mg-24         291   0  1.05686E-04  293.6  end
'Mg-25         291   0  1.33797E-05  293.6  end
'Mg-26         291   0  1.47310E-05  293.6  end
Al-27          291   0  2.89993E-02  293.6  end
'Si-28         291   0  1.02644E-04  293.6  end
'Si-29         291   0  5.19729E-06  293.6  end
'Si-30         291   0  3.45002E-06  293.6  end
'Ti-46         291   0  4.20262E-07  293.6  end
'Ti-47         291   0  3.79000E-07  293.6  end
'Ti-48         291   0  3.75536E-06  293.6  end
'Ti-49         291   0  2.75590E-07  293.6  end
'Ti-50         291   0  2.63873E-07  293.6  end
'Cr-50         291   0  5.30517E-07  293.6  end
'Cr-52         291   0  1.02189E-05  293.6  end
'Cr-53         291   0  1.15860E-06  293.6  end
'Cr-54         291   0  2.87821E-07  293.6  end
'Mn-55         291   0  6.57731E-06  293.6  end
'Fe-54         291   0  2.42259E-06  293.6  end
'Fe-56         291   0  3.79953E-05  293.6  end
'Fe-57         291   0  8.77930E-07  293.6  end
'Fe-58         291   0  1.15953E-07  293.6  end
'Cu-63         291   0  1.92203E-05  293.6  end
'Cu-65         291   0  8.56676E-06  293.6  end
 U-234         291   0  2.20708E-06  293.6  end
 U-235         291   0  2.20178E-04  293.6  end
 U-236         291   0  8.82838E-07  293.6  end
 U-238         291   0  1.19182E-05  293.6  end
 Pu-239        291  0  5.98421E-07 300 end
Pu-240         291  0  3.13646E-08 300 end
'      total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1          292   0  3.32434E-02  293.6  end
' B-10         292   0  1.77513E-05  293.6  end
' B-11         292   0  7.19107E-05  293.6  end
 O-16          292   0  1.73053E-02  293.6  end
'Mg-24         292   0  1.05686E-04  293.6  end
'Mg-25         292   0  1.33797E-05  293.6  end
'Mg-26         292   0  1.47310E-05  293.6  end
Al-27          292   0  2.88388E-02  293.6  end
'Si-28         292   0  1.02285E-04  293.6  end
'Si-29         292   0  5.17912E-06  293.6  end
'Si-30         292   0  3.43796E-06  293.6  end
'Ti-46         292   0  4.20262E-07  293.6  end
'Ti-47         292   0  3.79000E-07  293.6  end
'Ti-48         292   0  3.75536E-06  293.6  end
'Ti-49         292   0  2.75590E-07  293.6  end
'Ti-50         292   0  2.63873E-07  293.6  end
'Cr-50         292   0  5.30517E-07  293.6  end
'Cr-52         292   0  1.02189E-05  293.6  end
'Cr-53         292   0  1.15860E-06  293.6  end
'Cr-54         292   0  2.87821E-07  293.6  end
'Mn-55         292   0  6.55746E-06  293.6  end
'Fe-54         292   0  2.41117E-06  293.6  end
'Fe-56         292   0  3.78162E-05  293.6  end
'Fe-57         292   0  8.73792E-07  293.6  end
'Fe-58         292   0  1.15406E-07  293.6  end
'Cu-63         292   0  1.91542E-05  293.6  end
'Cu-65         292   0  8.53729E-06  293.6  end
 U-234         292   0  2.69313E-06  293.6  end
 U-235         292   0  2.65478E-04  293.6  end
 U-236         292   0  1.07726E-06  293.6  end
 U-238         292   0  1.45429E-05  293.6  end
 Pu-239        292  0  5.98421E-07 300 end
Pu-240         292  0  3.13646E-08 300 end
'      total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1          293   0  3.32435E-02  293.6  end
' B-10         293   0  1.46911E-05  293.6  end
' B-11         293   0  5.95139E-05  293.6  end
 O-16          293   0  1.74543E-02  293.6  end
'Mg-24         293   0  1.05686E-04  293.6  end
'Mg-25         293   0  1.33797E-05  293.6  end
'Mg-26         293   0  1.47310E-05  293.6  end
Al-27          293   0  2.86541E-02  293.6  end
'Si-28         293   0  1.01874E-04  293.6  end
'Si-29         293   0  5.15831E-06  293.6  end
'Si-30         293   0  3.42415E-06  293.6  end
'Ti-46         293   0  4.20263E-07  293.6  end
'Ti-47         293   0  3.79001E-07  293.6  end
'Ti-48         293   0  3.75537E-06  293.6  end
'Ti-49         293   0  2.75590E-07  293.6  end
'Ti-50         293   0  2.63873E-07  293.6  end
'Cr-50         293   0  5.30518E-07  293.6  end
'Cr-52         293   0  1.02189E-05  293.6  end
'Cr-53         293   0  1.15860E-06  293.6  end
'Cr-54         293   0  2.87821E-07  293.6  end
'Mn-55         293   0  6.53464E-06  293.6  end
'Fe-54         293   0  2.39803E-06  293.6  end
'Fe-56         293   0  3.76103E-05  293.6  end
'Fe-57         293   0  8.69031E-07  293.6  end
'Fe-58         293   0  1.14778E-07  293.6  end
'Cu-63         293   0  1.90782E-05  293.6  end
'Cu-65         293   0  8.50342E-06  293.6  end
 U-234         293   0  3.25215E-06  293.6  end
 U-235         293   0  3.17578E-04  293.6  end
 U-236         293   0  1.30087E-06  293.6  end
 U-238         293   0  1.75616E-05  293.6  end
 Pu-239        293  0  5.98421E-07 300 end
Pu-240         293  0  3.13646E-08 300 end
'      total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1          294   0  3.32434E-02  293.6  end
' B-10         294   0  1.03798E-05  293.6  end
' B-11         294   0  4.20486E-05  293.6  end
 O-16          294   0  1.76644E-02  293.6  end
'Mg-24         294   0  1.05686E-04  293.6  end
'Mg-25         294   0  1.33797E-05  293.6  end
'Mg-26         294   0  1.47310E-05  293.6  end
Al-27          294   0  2.83940E-02  293.6  end
'Si-28         294   0  1.01293E-04  293.6  end
'Si-29         294   0  5.12887E-06  293.6  end
'Si-30         294   0  3.40461E-06  293.6  end
'Ti-46         294   0  4.20262E-07  293.6  end
'Ti-47         294   0  3.79000E-07  293.6  end
'Ti-48         294   0  3.75536E-06  293.6  end
'Ti-49         294   0  2.75590E-07  293.6  end
'Ti-50         294   0  2.63873E-07  293.6  end
'Cr-50         294   0  5.30517E-07  293.6  end
'Cr-52         294   0  1.02189E-05  293.6  end
'Cr-53         294   0  1.15860E-06  293.6  end
'Cr-54         294   0  2.87821E-07  293.6  end
'Mn-55         294   0  6.50246E-06  293.6  end
'Fe-54         294   0  2.37952E-06  293.6  end
'Fe-56         294   0  3.73198E-05  293.6  end
'Fe-57         294   0  8.62321E-07  293.6  end
'Fe-58         294   0  1.13891E-07  293.6  end
'Cu-63         294   0  1.89710E-05  293.6  end
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'Cu-65      294   0  8.45562E-06  293.6  end
 U-234      294   0  4.03970E-06  293.6  end
 U-235      294   0  3.90978E-04  293.6  end
 U-236      294   0  1.61589E-06  293.6  end
 U-238      294   0  2.18144E-05  293.6  end
 Pu-239     294  0  5.98421E-07 300 end
Pu-240      294  0  3.13646E-08 300 end
'      total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1        295   0  3.32434E-02  293.6  end
' B-10      295   0  6.18010E-06  293.6  end
' B-11      295   0  2.50356E-05  293.6  end
 O-16       295   0  1.78689E-02  293.6  end
'Mg-24      295   0  1.05686E-04  293.6  end
'Mg-25      295   0  1.33797E-05  293.6  end
'Mg-26      295   0  1.47310E-05  293.6  end
Al-27       295   0  2.81406E-02  293.6  end
'Si-28      295   0  1.00727E-04  293.6  end
'Si-29      295   0  5.10026E-06  293.6  end
'Si-30      295   0  3.38560E-06  293.6  end
'Ti-46      295   0  4.20262E-07  293.6  end
'Ti-47      295   0  3.79000E-07  293.6  end
'Ti-48      295   0  3.75536E-06  293.6  end
'Ti-49      295   0  2.75590E-07  293.6  end
'Ti-50      295   0  2.63873E-07  293.6  end
'Cr-50      295   0  5.30518E-07  293.6  end
'Cr-52      295   0  1.02189E-05  293.6  end
'Cr-53      295   0  1.15860E-06  293.6  end
'Cr-54      295   0  2.87821E-07  293.6  end
'Mn-55      295   0  6.47114E-06  293.6  end
'Fe-54      295   0  2.36149E-06  293.6  end
'Fe-56      295   0  3.70370E-05  293.6  end
'Fe-57      295   0  8.55788E-07  293.6  end
'Fe-58      295   0  1.13028E-07  293.6  end
'Cu-63      295   0  1.88666E-05  293.6  end
'Cu-65      295   0  8.40911E-06  293.6  end
 U-234      295   0  4.80687E-06  293.6  end
 U-235      295   0  4.62478E-04  293.6  end
 U-236      295   0  1.92276E-06  293.6  end
 U-238      295   0  2.59571E-05  293.6  end
 Pu-239     295  0  5.98421E-07 300 end
Pu-240      295  0  3.13646E-08 300 end
'      total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1        296   0  3.32434E-02  293.6  end
' B-10      296   0  5.79830E-06  293.6  end
' B-11      296   0  2.34889E-05  293.6  end
 O-16       296   0  1.78875E-02  293.6  end
'Mg-24      296   0  1.05686E-04  293.6  end
'Mg-25      296   0  1.33797E-05  293.6  end
'Mg-26      296   0  1.47310E-05  293.6  end
Al-27       296   0  2.81176E-02  293.6  end
'Si-28      296   0  1.00676E-04  293.6  end
'Si-29      296   0  5.09768E-06  293.6  end
'Si-30      296   0  3.38390E-06  293.6  end
'Ti-46      296   0  4.20262E-07  293.6  end
'Ti-47      296   0  3.79000E-07  293.6  end
'Ti-48      296   0  3.75536E-06  293.6  end
'Ti-49      296   0  2.75590E-07  293.6  end
'Ti-50      296   0  2.63873E-07  293.6  end
'Cr-50      296   0  5.30517E-07  293.6  end
'Cr-52      296   0  1.02189E-05  293.6  end
'Cr-53      296   0  1.15860E-06  293.6  end
'Cr-54      296   0  2.87821E-07  293.6  end
'Mn-55      296   0  6.46828E-06  293.6  end
'Fe-54      296   0  2.35985E-06  293.6  end
'Fe-56      296   0  3.70113E-05  293.6  end
'Fe-57      296   0  8.55193E-07  293.6  end
'Fe-58      296   0  1.12950E-07  293.6  end
'Cu-63      296   0  1.88571E-05  293.6  end
'Cu-65      296   0  8.40487E-06  293.6  end
 U-234      296   0  4.87661E-06  293.6  end
 U-235      296   0  4.68978E-04  293.6  end
 U-236      296   0  1.95066E-06  293.6  end
 U-238      296   0  2.63337E-05  293.6  end
 Pu-239     296  0  5.98421E-07 300 end
Pu-240      296  0  3.13646E-08 300 end
'      total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1        297   0  3.32434E-02  293.6  end
' B-10      297   0  7.99507E-06  293.6  end
' B-11      297   0  3.23880E-05  293.6  end
 O-16       297   0  1.77805E-02  293.6  end
'Mg-24      297   0  1.05686E-04  293.6  end
'Mg-25      297   0  1.33797E-05  293.6  end
'Mg-26      297   0  1.47310E-05  293.6  end
Al-27       297   0  2.82501E-02  293.6  end
'Si-28      297   0  1.00972E-04  293.6  end
'Si-29      297   0  5.11262E-06  293.6  end
'Si-30      297   0  3.39382E-06  293.6  end
'Ti-46      297   0  4.20262E-07  293.6  end
'Ti-47      297   0  3.79000E-07  293.6  end
'Ti-48      297   0  3.75536E-06  293.6  end
'Ti-49      297   0  2.75590E-07  293.6  end
'Ti-50      297   0  2.63873E-07  293.6  end
'Cr-50      297   0  5.30517E-07  293.6  end
'Cr-52      297   0  1.02189E-05  293.6  end
'Cr-53      297   0  1.15860E-06  293.6  end
'Cr-54      297   0  2.87821E-07  293.6  end
'Mn-55      297   0  6.48467E-06  293.6  end
'Fe-54      297   0  2.36928E-06  293.6  end
'Fe-56      297   0  3.71592E-05  293.6  end
'Fe-57      297   0  8.58611E-07  293.6  end
'Fe-58      297   0  1.13401E-07  293.6  end
'Cu-63      297   0  1.89118E-05  293.6  end
'Cu-65      297   0  8.42923E-06  293.6  end
 U-234      297   0  4.47532E-06  293.6  end
 U-235      297   0  4.31578E-04  293.6  end
 U-236      297   0  1.79014E-06  293.6  end
 U-238      297   0  2.41667E-05  293.6  end
 Pu-239     297  0  5.98421E-07 300 end
Pu-240      297  0  3.13646E-08 300 end
'      total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1        298   0  3.32434E-02  293.6  end
' B-10      298   0  1.06559E-05  293.6  end
' B-11      298   0  4.31670E-05  293.6  end
 O-16       298   0  1.76509E-02  293.6  end
'Mg-24      298   0  1.05686E-04  293.6  end
'Mg-25      298   0  1.33797E-05  293.6  end
'Mg-26      298   0  1.47310E-05  293.6  end
Al-27       298   0  2.84107E-02  293.6  end
'Si-28      298   0  1.01330E-04  293.6  end
'Si-29      298   0  5.13079E-06  293.6  end
'Si-30      298   0  3.40588E-06  293.6  end
'Ti-46      298   0  4.20262E-07  293.6  end
'Ti-47      298   0  3.79000E-07  293.6  end
'Ti-48      298   0  3.75536E-06  293.6  end
'Ti-49      298   0  2.75590E-07  293.6  end
'Ti-50      298   0  2.63873E-07  293.6  end
'Cr-50      298   0  5.30517E-07  293.6  end
'Cr-52      298   0  1.02189E-05  293.6  end
'Cr-53      298   0  1.15860E-06  293.6  end
'Cr-54      298   0  2.87821E-07  293.6  end
'Mn-55      298   0  6.50452E-06  293.6  end
'Fe-54      298   0  2.38070E-06  293.6  end
'Fe-56      298   0  3.73384E-05  293.6  end
'Fe-57      298   0  8.62751E-07  293.6  end
'Fe-58      298   0  1.13948E-07  293.6  end
'Cu-63      298   0  1.89779E-05  293.6  end
'Cu-65      298   0  8.45870E-06  293.6  end
 U-234      298   0  3.98927E-06  293.6  end
 U-235      298   0  3.86278E-04  293.6  end
 U-236      298   0  1.59572E-06  293.6  end
 U-238      298   0  2.15420E-05  293.6  end
 Pu-239     298  0  5.98421E-07 300 end
Pu-240      298  0  3.13646E-08 300 end
'
'        Inner fuel element--fueled  central Axial region
'      total atom density =  8.00804E-02 a/b-cm
'  8.008040E-02
 H-1        201   0  3.32434E-02  293.6  end
' B-10      201   0  2.04121E-05  293.6  end
' B-11      201   0  8.26896E-05  293.6  end
 O-16       201   0  1.71757E-02  293.6  end
'Mg-24      201   0  1.05686E-04  293.6  end
'Mg-25      201   0  1.33797E-05  293.6  end
'Mg-26      201   0  1.47310E-05  293.6  end
Al-27       201   0  2.89993E-02  293.6  end
'Si-28      201   0  1.02644E-04  293.6  end
'Si-29      201   0  5.19729E-06  293.6  end
'Si-30      201   0  3.45002E-06  293.6  end
'Ti-46      201   0  4.20262E-07  293.6  end
'Ti-47      201   0  3.79000E-07  293.6  end
'Ti-48      201   0  3.75536E-06  293.6  end
'Ti-49      201   0  2.75590E-07  293.6  end
'Ti-50      201   0  2.63873E-07  293.6  end
'Cr-50      201   0  5.30517E-07  293.6  end
'Cr-52      201   0  1.02189E-05  293.6  end
'Cr-53      201   0  1.15860E-06  293.6  end
'Cr-54      201   0  2.87821E-07  293.6  end
'Mn-55      201   0  6.57731E-06  293.6  end
'Fe-54      201   0  2.42259E-06  293.6  end
'Fe-56      201   0  3.79953E-05  293.6  end
'Fe-57      201   0  8.77930E-07  293.6  end
'Fe-58      201   0  1.15953E-07  293.6  end
'Cu-63      201   0  1.92203E-05  293.6  end
'Cu-65      201   0  8.56676E-06  293.6  end
 U-234      201   0  2.20708E-06  293.6  end
 U-235      201   0  2.20178E-04  293.6  end
 U-236      201   0  8.82838E-07  293.6  end
 U-238      201   0  1.19182E-05  293.6  end
```

```
 Pu-239       201  0  5.98421E-07 300 end
Pu-240        201  0  3.13646E-08 300 end
'       total atom density =  8.00839E-02 a/b-cm
'  8.008390E-02
 H-1          202   0  3.32434E-02  293.6  end
' B-10        202   0  1.77513E-05  293.6  end
' B-11        202   0  7.19107E-05  293.6  end
 O-16         202   0  1.73053E-02  293.6  end
'Mg-24        202   0  1.05686E-04  293.6  end
'Mg-25        202   0  1.33797E-05  293.6  end
'Mg-26        202   0  1.47310E-05  293.6  end
Al-27         202   0  2.88388E-02  293.6  end
'Si-28        202   0  1.02285E-04  293.6  end
'Si-29        202   0  5.17912E-06  293.6  end
'Si-30        202   0  3.43796E-06  293.6  end
'Ti-46        202   0  4.20262E-07  293.6  end
'Ti-47        202   0  3.79000E-07  293.6  end
'Ti-48        202   0  3.75536E-06  293.6  end
'Ti-49        202   0  2.75590E-07  293.6  end
'Ti-50        202   0  2.63873E-07  293.6  end
'Cr-50        202   0  5.30517E-07  293.6  end
'Cr-52        202   0  1.02189E-05  293.6  end
'Cr-53        202   0  1.15860E-06  293.6  end
'Cr-54        202   0  2.87821E-07  293.6  end
'Mn-55        202   0  6.55746E-06  293.6  end
'Fe-54        202   0  2.41117E-06  293.6  end
'Fe-56        202   0  3.78162E-05  293.6  end
'Fe-57        202   0  8.73792E-07  293.6  end
'Fe-58        202   0  1.15406E-07  293.6  end
'Cu-63        202   0  1.91542E-05  293.6  end
'Cu-65        202   0  8.53729E-06  293.6  end
 U-234        202   0  2.69313E-06  293.6  end
 U-235        202   0  2.65478E-04  293.6  end
 U-236        202   0  1.07726E-06  293.6  end
 U-238        202   0  1.45429E-05  293.6  end
 Pu-239       202  0  5.98421E-07 300 end
Pu-240        202  0  3.13646E-08 300 end
'       total atom density =  8.00880E-02 a/b-cm
'  8.008800E-02
 H-1          203   0  3.32435E-02  293.6  end
' B-10        203   0  1.46911E-05  293.6  end
' B-11        203   0  5.95139E-05  293.6  end
 O-16         203   0  1.74543E-02  293.6  end
'Mg-24        203   0  1.05686E-04  293.6  end
'Mg-25        203   0  1.33797E-05  293.6  end
'Mg-26        203   0  1.47310E-05  293.6  end
Al-27         203   0  2.86541E-02  293.6  end
'Si-28        203   0  1.01874E-04  293.6  end
'Si-29        203   0  5.15831E-06  293.6  end
'Si-30        203   0  3.42415E-06  293.6  end
'Ti-46        203   0  4.20263E-07  293.6  end
'Ti-47        203   0  3.79001E-07  293.6  end
'Ti-48        203   0  3.75537E-06  293.6  end
'Ti-49        203   0  2.75590E-07  293.6  end
'Ti-50        203   0  2.63873E-07  293.6  end
'Cr-50        203   0  5.30518E-07  293.6  end
'Cr-52        203   0  1.02189E-05  293.6  end
'Cr-53        203   0  1.15860E-06  293.6  end
'Cr-54        203   0  2.87821E-07  293.6  end
'Mn-55        203   0  6.53464E-06  293.6  end
'Fe-54        203   0  2.39803E-06  293.6  end
'Fe-56        203   0  3.76103E-05  293.6  end
'Fe-57        203   0  8.69031E-07  293.6  end
'Fe-58        203   0  1.14778E-07  293.6  end
'Cu-63        203   0  1.90782E-05  293.6  end
'Cu-65        203   0  8.50342E-06  293.6  end
 U-234        203   0  3.25215E-06  293.6  end
 U-235        203   0  3.17578E-04  293.6  end
 U-236        203   0  1.30087E-06  293.6  end
 U-238        203   0  1.75616E-05  293.6  end
 Pu-239       203  0  5.98421E-07 300 end
Pu-240        203  0  3.13646E-08 300 end
'       total atom density =  8.00937E-02 a/b-cm
'  8.009370E-02
 H-1          204   0  3.32434E-02  293.6  end
' B-10        204   0  1.03798E-05  293.6  end
' B-11        204   0  4.20486E-05  293.6  end
 O-16         204   0  1.76644E-02  293.6  end
'Mg-24        204   0  1.05686E-04  293.6  end
'Mg-25        204   0  1.33797E-05  293.6  end
'Mg-26        204   0  1.47310E-05  293.6  end
Al-27         204   0  2.83940E-02  293.6  end
'Si-28        204   0  1.01293E-04  293.6  end
'Si-29        204   0  5.12887E-06  293.6  end
'Si-30        204   0  3.40461E-06  293.6  end
'Ti-46        204   0  4.20262E-07  293.6  end
'Ti-47        204   0  3.79000E-07  293.6  end
'Ti-48        204   0  3.75536E-06  293.6  end
'Ti-49        204   0  2.75590E-07  293.6  end
'Ti-50        204   0  2.63873E-07  293.6  end
'Cr-50        204   0  5.30517E-07  293.6  end
'Cr-52        204   0  1.02189E-05  293.6  end
'Cr-53        204   0  1.15860E-06  293.6  end
'Cr-54        204   0  2.87821E-07  293.6  end
'Mn-55        204   0  6.50246E-06  293.6  end
'Fe-54        204   0  2.37952E-06  293.6  end
'Fe-56        204   0  3.73198E-05  293.6  end
'Fe-57        204   0  8.62321E-07  293.6  end
'Fe-58        204   0  1.13891E-07  293.6  end
'Cu-63        204   0  1.89710E-05  293.6  end
'Cu-65        204   0  8.45562E-06  293.6  end
 U-234        204   0  4.03970E-06  293.6  end
 U-235        204   0  3.90978E-04  293.6  end
 U-236        204   0  1.61589E-06  293.6  end
 U-238        204   0  2.18144E-05  293.6  end
 Pu-239       204  0  5.98421E-07 300 end
Pu-240        204  0  3.13646E-08 300 end
'       total atom density =  8.00993E-02 a/b-cm
'  8.009930E-02
 H-1          205   0  3.32434E-02  293.6  end
' B-10        205   0  6.18010E-06  293.6  end
' B-11        205   0  2.50356E-05  293.6  end
 O-16         205   0  1.78689E-02  293.6  end
'Mg-24        205   0  1.05686E-04  293.6  end
'Mg-25        205   0  1.33797E-05  293.6  end
'Mg-26        205   0  1.47310E-05  293.6  end
Al-27         205   0  2.81406E-02  293.6  end
'Si-28        205   0  1.00727E-04  293.6  end
'Si-29        205   0  5.10026E-06  293.6  end
'Si-30        205   0  3.38560E-06  293.6  end
'Ti-46        205   0  4.20262E-07  293.6  end
'Ti-47        205   0  3.79000E-07  293.6  end
'Ti-48        205   0  3.75536E-06  293.6  end
'Ti-49        205   0  2.75590E-07  293.6  end
'Ti-50        205   0  2.63873E-07  293.6  end
'Cr-50        205   0  5.30518E-07  293.6  end
'Cr-52        205   0  1.02189E-05  293.6  end
'Cr-53        205   0  1.15860E-06  293.6  end
'Cr-54        205   0  2.87821E-07  293.6  end
'Mn-55        205   0  6.47114E-06  293.6  end
'Fe-54        205   0  2.36149E-06  293.6  end
'Fe-56        205   0  3.70370E-05  293.6  end
'Fe-57        205   0  8.55788E-07  293.6  end
'Fe-58        205   0  1.13028E-07  293.6  end
'Cu-63        205   0  1.88666E-05  293.6  end
'Cu-65        205   0  8.40911E-06  293.6  end
 U-234        205   0  4.80687E-06  293.6  end
 U-235        205   0  4.62478E-04  293.6  end
 U-236        205   0  1.92276E-06  293.6  end
 U-238        205   0  2.59571E-05  293.6  end
 Pu-239       205  0  5.98421E-07 300 end
Pu-240        205  0  3.13646E-08 300 end
'       total atom density =  8.00998E-02 a/b-cm
'  8.009980E-02
 H-1          206   0  3.32434E-02  293.6  end
' B-10        206   0  5.79830E-06  293.6  end
' B-11        206   0  2.34889E-05  293.6  end
 O-16         206   0  1.78875E-02  293.6  end
'Mg-24        206   0  1.05686E-04  293.6  end
'Mg-25        206   0  1.33797E-05  293.6  end
'Mg-26        206   0  1.47310E-05  293.6  end
Al-27         206   0  2.81176E-02  293.6  end
'Si-28        206   0  1.00676E-04  293.6  end
'Si-29        206   0  5.09768E-06  293.6  end
'Si-30        206   0  3.38390E-06  293.6  end
'Ti-46        206   0  4.20262E-07  293.6  end
'Ti-47        206   0  3.79000E-07  293.6  end
'Ti-48        206   0  3.75536E-06  293.6  end
'Ti-49        206   0  2.75590E-07  293.6  end
'Ti-50        206   0  2.63873E-07  293.6  end
'Cr-50        206   0  5.30517E-07  293.6  end
'Cr-52        206   0  1.02189E-05  293.6  end
'Cr-53        206   0  1.15860E-06  293.6  end
'Cr-54        206   0  2.87821E-07  293.6  end
'Mn-55        206   0  6.46828E-06  293.6  end
'Fe-54        206   0  2.35985E-06  293.6  end
'Fe-56        206   0  3.70113E-05  293.6  end
'Fe-57        206   0  8.55193E-07  293.6  end
'Fe-58        206   0  1.12950E-07  293.6  end
'Cu-63        206   0  1.88571E-05  293.6  end
'Cu-65        206   0  8.40487E-06  293.6  end
 U-234        206   0  4.87661E-06  293.6  end
 U-235        206   0  4.68978E-04  293.6  end
 U-236        206   0  1.95066E-06  293.6  end
 U-238        206   0  2.63337E-05  293.6  end
 Pu-239       206  0  5.98421E-07 300 end
Pu-240        206  0  3.13646E-08 300 end
'       total atom density =  8.00968E-02 a/b-cm
'  8.009680E-02
 H-1          207   0  3.32434E-02  293.6  end
' B-10        207   0  7.99507E-06  293.6  end
' B-11        207   0  3.23880E-05  293.6  end
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 O-16          207    0   1.77805E-02   293.6   end
'Mg-24         207    0   1.05686E-04   293.6   end
'Mg-25         207    0   1.33797E-05   293.6   end
'Mg-26         207    0   1.47310E-05   293.6   end
Al-27          207    0   2.82501E-02   293.6   end
'Si-28         207    0   1.00972E-04   293.6   end
'Si-29         207    0   5.11262E-06   293.6   end
'Si-30         207    0   3.39382E-06   293.6   end
'Ti-46         207    0   4.20262E-07   293.6   end
'Ti-47         207    0   3.79000E-07   293.6   end
'Ti-48         207    0   3.75536E-06   293.6   end
'Ti-49         207    0   2.75590E-07   293.6   end
'Ti-50         207    0   2.63873E-07   293.6   end
'Cr-50         207    0   5.30517E-07   293.6   end
'Cr-52         207    0   1.02189E-05   293.6   end
'Cr-53         207    0   1.15860E-06   293.6   end
'Cr-54         207    0   2.87821E-07   293.6   end
'Mn-55         207    0   6.48467E-06   293.6   end
'Fe-54         207    0   2.36928E-06   293.6   end
'Fe-56         207    0   3.71592E-05   293.6   end
'Fe-57         207    0   8.58611E-07   293.6   end
'Fe-58         207    0   1.13401E-07   293.6   end
'Cu-63         207    0   1.89118E-05   293.6   end
'Cu-65         207    0   8.42923E-06   293.6   end
 U-234         207    0   4.47532E-06   293.6   end
 U-235         207    0   4.31578E-04   293.6   end
 U-236         207    0   1.79014E-06   293.6   end
 U-238         207    0   2.41667E-05   293.6   end
 Pu-239        207  0  5.98421E-07 300 end
Pu-240         207  0  3.13646E-08 300 end
'       total atom density =  8.00933E-02 a/b-cm
'  8.009330E-02
 H-1           208    0   3.32434E-02   293.6   end
' B-10          208    0   1.06559E-05   293.6   end
' B-11          208    0   4.31670E-05   293.6   end
 O-16          208    0   1.76509E-02   293.6   end
'Mg-24         208    0   1.05686E-04   293.6   end
'Mg-25         208    0   1.33797E-05   293.6   end
'Mg-26         208    0   1.47310E-05   293.6   end
Al-27          208    0   2.84107E-02   293.6   end
'Si-28         208    0   1.01330E-04   293.6   end
'Si-29         208    0   5.13079E-06   293.6   end
'Si-30         208    0   3.40588E-06   293.6   end
'Ti-46         208    0   4.20262E-07   293.6   end
'Ti-47         208    0   3.79000E-07   293.6   end
'Ti-48         208    0   3.75536E-06   293.6   end
'Ti-49         208    0   2.75590E-07   293.6   end
'Ti-50         208    0   2.63873E-07   293.6   end
'Cr-50         208    0   5.30517E-07   293.6   end
'Cr-52         208    0   1.02189E-05   293.6   end
'Cr-53         208    0   1.15860E-06   293.6   end
'Cr-54         208    0   2.87821E-07   293.6   end
'Mn-55         208    0   6.50452E-06   293.6   end
'Fe-54         208    0   2.38070E-06   293.6   end
'Fe-56         208    0   3.73384E-05   293.6   end
'Fe-57         208    0   8.62751E-07   293.6   end
'Fe-58         208    0   1.13948E-07   293.6   end
'Cu-63         208    0   1.89779E-05   293.6   end
'Cu-65         208    0   8.45870E-06   293.6   end
 U-234         208    0   3.98927E-06   293.6   end
 U-235         208    0   3.86278E-04   293.6   end
 U-236         208    0   1.59572E-06   293.6   end
 U-238         208    0   2.15420E-05   293.6   end
 Pu-239        208  0  5.98421E-07 300 end
Pu-240         208  0  3.13646E-08 300 end
'
'
' ==========================================================
' |                                        |
' |                  OFE                   |
' |                                        |
' ==========================================================
'       Outer Fuel Element  fueled region 1
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1           311    0   3.32434E-02   293.6   end
 O-16          311    0   1.77945E-02   293.6   end
'Mg-24         311    0   1.05686E-04   293.6   end
'Mg-25         311    0   1.33797E-05   293.6   end
'Mg-26         311    0   1.47310E-05   293.6   end
Al-27          311    0   2.82328E-02   293.6   end
'Si-28         311    0   1.00933E-04   293.6   end
'Si-29         311    0   5.11066E-06   293.6   end
'Si-30         311    0   3.39252E-06   293.6   end
'Ti-46         311    0   4.20262E-07   293.6   end
'Ti-47         311    0   3.79000E-07   293.6   end
'Ti-48         311    0   3.75536E-06   293.6   end
'Ti-49         311    0   2.75590E-07   293.6   end
'Ti-50         311    0   2.63873E-07   293.6   end
'Cr-50         311    0   5.30517E-07   293.6   end
'Cr-52         311    0   1.02189E-05   293.6   end
'Cr-53         311    0   1.15860E-06   293.6   end
'Cr-54         311    0   2.87821E-07   293.6   end
'Mn-55         311    0   6.48252E-06   293.6   end
'Fe-54         311    0   2.36804E-06   293.6   end
'Fe-56         311    0   3.71398E-05   293.6   end
'Fe-57         311    0   8.58163E-07   293.6   end
'Fe-58         311    0   1.13342E-07   293.6   end
'Cu-63         311    0   1.89046E-05   293.6   end
'Cu-65         311    0   8.42602E-06   293.6   end
 U-234         311    0   4.52789E-06   293.6   end
 U-235         311    0   4.36478E-04   293.6   end
 U-236         311    0   1.81117E-06   293.6   end
 U-238         311    0   2.44506E-05   293.6   end
 Pu-239        311  0  5.98421E-07 300 end
Pu-240         311  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1           312    0   3.32434E-02   293.6   end
 O-16          312    0   1.80329E-02   293.6   end
'Mg-24         312    0   1.05686E-04   293.6   end
'Mg-25         312    0   1.33797E-05   293.6   end
'Mg-26         312    0   1.47310E-05   293.6   end
Al-27          312    0   2.79375E-02   293.6   end
'Si-28         312    0   1.00274E-04   293.6   end
'Si-29         312    0   5.07732E-06   293.6   end
'Si-30         312    0   3.37038E-06   293.6   end
'Ti-46         312    0   4.20262E-07   293.6   end
'Ti-47         312    0   3.79000E-07   293.6   end
'Ti-48         312    0   3.75536E-06   293.6   end
'Ti-49         312    0   2.75590E-07   293.6   end
'Ti-50         312    0   2.63873E-07   293.6   end
'Cr-50         312    0   5.30517E-07   293.6   end
'Cr-52         312    0   1.02189E-05   293.6   end
'Cr-53         312    0   1.15860E-06   293.6   end
'Cr-54         312    0   2.87821E-07   293.6   end
'Mn-55         312    0   6.44602E-06   293.6   end
'Fe-54         312    0   2.34704E-06   293.6   end
'Fe-56         312    0   3.68104E-05   293.6   end
'Fe-57         312    0   8.50550E-07   293.6   end
'Fe-58         312    0   1.12337E-07   293.6   end
'Cu-63         312    0   1.87830E-05   293.6   end
'Cu-65         312    0   8.37182E-06   293.6   end
 U-234         312    0   5.42167E-06   293.6   end
 U-235         312    0   5.19778E-04   293.6   end
 U-236         312    0   2.16868E-06   293.6   end
 U-238         312    0   2.92770E-05   293.6   end
 Pu-239        312  0  5.98421E-07 300 end
Pu-240         312  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1           313    0   3.32434E-02   293.6   end
 O-16          313    0   1.82870E-02   293.6   end
'Mg-24         313    0   1.05686E-04   293.6   end
'Mg-25         313    0   1.33797E-05   293.6   end
'Mg-26         313    0   1.47310E-05   293.6   end
Al-27          313    0   2.76228E-02   293.6   end
'Si-28         313    0   9.95724E-05   293.6   end
'Si-29         313    0   5.04178E-06   293.6   end
'Si-30         313    0   3.34679E-06   293.6   end
'Ti-46         313    0   4.20262E-07   293.6   end
'Ti-47         313    0   3.79000E-07   293.6   end
'Ti-48         313    0   3.75536E-06   293.6   end
'Ti-49         313    0   2.75590E-07   293.6   end
'Ti-50         313    0   2.63873E-07   293.6   end
'Cr-50         313    0   5.30517E-07   293.6   end
'Cr-52         313    0   1.02189E-05   293.6   end
'Cr-53         313    0   1.15860E-06   293.6   end
'Cr-54         313    0   2.87821E-07   293.6   end
'Mn-55         313    0   6.40711E-06   293.6   end
'Fe-54         313    0   2.32464E-06   293.6   end
'Fe-56         313    0   3.64591E-05   293.6   end
'Fe-57         313    0   8.42433E-07   293.6   end
'Fe-58         313    0   1.11265E-07   293.6   end
'Cu-63         313    0   1.86534E-05   293.6   end
'Cu-65         313    0   8.31405E-06   293.6   end
 U-234         313    0   6.37446E-06   293.6   end
 U-235         313    0   6.08578E-04   293.6   end
 U-236         313    0   2.54980E-06   293.6   end
 U-238         313    0   3.44221E-05   293.6   end
 Pu-239        313  0  5.98421E-07 300 end
Pu-240         313  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1           314    0   3.32434E-02   293.6   end
 O-16          314    0   1.85176E-02   293.6   end
'Mg-24         314    0   1.05686E-04   293.6   end
'Mg-25         314    0   1.33797E-05   293.6   end
'Mg-26         314    0   1.47310E-05   293.6   end
Al-27          314    0   2.73372E-02   293.6   end
'Si-28         314    0   9.89350E-05   293.6   end
'Si-29         314    0   5.00951E-06   293.6   end
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'Si-30          314    0   3.32537E-06   293.6   end
'Ti-46          314    0   4.20262E-07   293.6   end
'Ti-47          314    0   3.79000E-07   293.6   end
'Ti-48          314    0   3.75536E-06   293.6   end
'Ti-49          314    0   2.75590E-07   293.6   end
'Ti-50          314    0   2.63873E-07   293.6   end
'Cr-50          314    0   5.30517E-07   293.6   end
'Cr-52          314    0   1.02189E-05   293.6   end
'Cr-53          314    0   1.15860E-06   293.6   end
'Cr-54          314    0   2.87821E-07   293.6   end
'Mn-55          314    0   6.37178E-06   293.6   end
'Fe-54          314    0   2.30432E-06   293.6   end
'Fe-56          314    0   3.61403E-05   293.6   end
'Fe-57          314    0   8.35068E-07   293.6   end
'Fe-58          314    0   1.10292E-07   293.6   end
'Cu-63          314    0   1.85357E-05   293.6   end
'Cu-65          314    0   8.26161E-06   293.6   end
 U-234          314    0   7.23926E-06   293.6   end
 U-235          314    0   6.89178E-04   293.6   end
 U-236          314    0   2.89573E-06   293.6   end
 U-238          314    0   3.90920E-05   293.6   end
 Pu-239         314  0  5.98421E-07 300 end
Pu-240          314  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1            315    0   3.32434E-02   293.6   end
 O-16           315    0   1.84469E-02   293.6   end
'Mg-24          315    0   1.05686E-04   293.6   end
'Mg-25          315    0   1.33797E-05   293.6   end
'Mg-26          315    0   1.47310E-05   293.6   end
Al-27           315    0   2.74247E-02   293.6   end
'Si-28          315    0   9.91306E-05   293.6   end
'Si-29          315    0   5.01941E-06   293.6   end
'Si-30          315    0   3.33194E-06   293.6   end
'Ti-46          315    0   4.20262E-07   293.6   end
'Ti-47          315    0   3.79000E-07   293.6   end
'Ti-48          315    0   3.75536E-06   293.6   end
'Ti-49          315    0   2.75590E-07   293.6   end
'Ti-50          315    0   2.63873E-07   293.6   end
'Cr-50          315    0   5.30517E-07   293.6   end
'Cr-52          315    0   1.02189E-05   293.6   end
'Cr-53          315    0   1.15860E-06   293.6   end
'Cr-54          315    0   2.87821E-07   293.6   end
'Mn-55          315    0   6.38261E-06   293.6   end
'Fe-54          315    0   2.31055E-06   293.6   end
'Fe-56          315    0   3.62380E-05   293.6   end
'Fe-57          315    0   8.37326E-07   293.6   end
'Fe-58          315    0   1.10590E-07   293.6   end
'Cu-63          315    0   1.85717E-05   293.6   end
'Cu-65          315    0   8.27767E-06   293.6   end
 U-234          315    0   6.97424E-06   293.6   end
 U-235          315    0   6.64478E-04   293.6   end
 U-236          315    0   2.78972E-06   293.6   end
 U-238          315    0   3.76609E-05   293.6   end
 Pu-239         315  0  5.98421E-07 300 end
Pu-240          315  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1            316    0   3.32434E-02   293.6   end
 O-16           316    0   1.81013E-02   293.6   end
'Mg-24          316    0   1.05686E-04   293.6   end
'Mg-25          316    0   1.33797E-05   293.6   end
'Mg-26          316    0   1.47310E-05   293.6   end
Al-27           316    0   2.78528E-02   293.6   end
'Si-28          316    0   1.00085E-04   293.6   end
'Si-29          316    0   5.06774E-06   293.6   end
'Si-30          316    0   3.36403E-06   293.6   end
'Ti-46          316    0   4.20262E-07   293.6   end
'Ti-47          316    0   3.79000E-07   293.6   end
'Ti-48          316    0   3.75536E-06   293.6   end
'Ti-49          316    0   2.75590E-07   293.6   end
'Ti-50          316    0   2.63873E-07   293.6   end
'Cr-50          316    0   5.30517E-07   293.6   end
'Cr-52          316    0   1.02189E-05   293.6   end
'Cr-53          316    0   1.15860E-06   293.6   end
'Cr-54          316    0   2.87821E-07   293.6   end
'Mn-55          316    0   6.43555E-06   293.6   end
'Fe-54          316    0   2.34101E-06   293.6   end
'Fe-56          316    0   3.67158E-05   293.6   end
'Fe-57          316    0   8.48365E-07   293.6   end
'Fe-58          316    0   1.12048E-07   293.6   end
'Cu-63          316    0   1.87481E-05   293.6   end
'Cu-65          316    0   8.35629E-06   293.6   end
 U-234          316    0   5.67811E-06   293.6   end
 U-235          316    0   5.43678E-04   293.6   end
 U-236          316    0   2.27126E-06   293.6   end
 U-238          316    0   3.06618E-05   293.6   end
 Pu-239         316  0  5.98421E-07 300 end
Pu-240          316  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            317    0   3.32434E-02   293.6   end
 O-16           317    0   1.77731E-02   293.6   end
'Mg-24          317    0   1.05686E-04   293.6   end
'Mg-25          317    0   1.33797E-05   293.6   end
'Mg-26          317    0   1.47310E-05   293.6   end
Al-27           317    0   2.82593E-02   293.6   end
'Si-28          317    0   1.00993E-04   293.6   end
'Si-29          317    0   5.11370E-06   293.6   end
'Si-30          317    0   3.39453E-06   293.6   end
'Ti-46          317    0   4.20262E-07   293.6   end
'Ti-47          317    0   3.79000E-07   293.6   end
'Ti-48          317    0   3.75536E-06   293.6   end
'Ti-49          317    0   2.75590E-07   293.6   end
'Ti-50          317    0   2.63873E-07   293.6   end
'Cr-50          317    0   5.30517E-07   293.6   end
'Cr-52          317    0   1.02189E-05   293.6   end
'Cr-53          317    0   1.15860E-06   293.6   end
'Cr-54          317    0   2.87821E-07   293.6   end
'Mn-55          317    0   6.48581E-06   293.6   end
'Fe-54          317    0   2.36993E-06   293.6   end
'Fe-56          317    0   3.71695E-05   293.6   end
'Fe-57          317    0   8.58848E-07   293.6   end
'Fe-58          317    0   1.13433E-07   293.6   end
'Cu-63          317    0   1.89155E-05   293.6   end
'Cu-65          317    0   8.43090E-06   293.6   end
 U-234          317    0   4.44742E-06   293.6   end
 U-235          317    0   4.28978E-04   293.6   end
 U-236          317    0   1.77898E-06   293.6   end
 U-238          317    0   2.40161E-05   293.6   end
 Pu-239         317  0  5.98421E-07 300 end
Pu-240          317  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            318    0   3.32434E-02   293.6   end
 O-16           318    0   1.75562E-02   293.6   end
'Mg-24          318    0   1.05686E-04   293.6   end
'Mg-25          318    0   1.33797E-05   293.6   end
'Mg-26          318    0   1.47310E-05   293.6   end
Al-27           318    0   2.85280E-02   293.6   end
'Si-28          318    0   1.01591E-04   293.6   end
'Si-29          318    0   5.14401E-06   293.6   end
'Si-30          318    0   3.41465E-06   293.6   end
'Ti-46          318    0   4.20262E-07   293.6   end
'Ti-47          318    0   3.79000E-07   293.6   end
'Ti-48          318    0   3.75536E-06   293.6   end
'Ti-49          318    0   2.75590E-07   293.6   end
'Ti-50          318    0   2.63873E-07   293.6   end
'Cr-50          318    0   5.30517E-07   293.6   end
'Cr-52          318    0   1.02189E-05   293.6   end
'Cr-53          318    0   1.15860E-06   293.6   end
'Cr-54          318    0   2.87821E-07   293.6   end
'Mn-55          318    0   6.51903E-06   293.6   end
'Fe-54          318    0   2.38905E-06   293.6   end
'Fe-56          318    0   3.74693E-05   293.6   end
'Fe-57          318    0   8.65776E-07   293.6   end
'Fe-58          318    0   1.14348E-07   293.6   end
'Cu-63          318    0   1.90262E-05   293.6   end
'Cu-65          318    0   8.48022E-06   293.6   end
 U-234          318    0   3.63412E-06   293.6   end
 U-235          318    0   3.53178E-04   293.6   end
 U-236          318    0   1.45366E-06   293.6   end
 U-238          318    0   1.96242E-05   293.6   end
 Pu-239         318  0  5.98421E-07 300 end
Pu-240          318  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            319    0   3.32434E-02   293.6   end
 O-16           319    0   1.73591E-02   293.6   end
'Mg-24          319    0   1.05686E-04   293.6   end
'Mg-25          319    0   1.33797E-05   293.6   end
'Mg-26          319    0   1.47310E-05   293.6   end
Al-27           319    0   2.87722E-02   293.6   end
'Si-28          319    0   1.02136E-04   293.6   end
'Si-29          319    0   5.17160E-06   293.6   end
'Si-30          319    0   3.43297E-06   293.6   end
'Ti-46          319    0   4.20262E-07   293.6   end
'Ti-47          319    0   3.79000E-07   293.6   end
'Ti-48          319    0   3.75536E-06   293.6   end
'Ti-49          319    0   2.75590E-07   293.6   end
'Ti-50          319    0   2.63873E-07   293.6   end
'Cr-50          319    0   5.30517E-07   293.6   end
'Cr-52          319    0   1.02189E-05   293.6   end
'Cr-53          319    0   1.15860E-06   293.6   end
'Cr-54          319    0   2.87821E-07   293.6   end
'Mn-55          319    0   6.54922E-06   293.6   end
'Fe-54          319    0   2.40643E-06   293.6   end
'Fe-56          319    0   3.77418E-05   293.6   end
'Fe-57          319    0   8.72072E-07   293.6   end
'Fe-58          319    0   1.15179E-07   293.6   end
'Cu-63          319    0   1.91268E-05   293.6   end
'Cu-65          319    0   8.52504E-06   293.6   end
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 U-234        319   0  2.89485E-06  293.6  end
 U-235        319   0  2.84278E-04  293.6  end
 U-236        319   0  1.15795E-06  293.6  end
 U-238        319   0  1.56322E-05  293.6  end
 Pu-239       319  0  5.98421E-07 300 end
Pu-240        319  0  3.13646E-08 300 end
'
'      Outer Fuel Element  fueled region 2
'      total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1          321   0  3.32434E-02  293.6  end
 O-16         321   0  1.77945E-02  293.6  end
'Mg-24        321   0  1.05686E-04  293.6  end
'Mg-25        321   0  1.33797E-05  293.6  end
'Mg-26        321   0  1.47310E-05  293.6  end
Al-27         321   0  2.82328E-02  293.6  end
'Si-28        321   0  1.00933E-04  293.6  end
'Si-29        321   0  5.11066E-06  293.6  end
'Si-30        321   0  3.39252E-06  293.6  end
'Ti-46        321   0  4.20262E-07  293.6  end
'Ti-47        321   0  3.79000E-07  293.6  end
'Ti-48        321   0  3.75536E-06  293.6  end
'Ti-49        321   0  2.75590E-07  293.6  end
'Ti-50        321   0  2.63873E-07  293.6  end
'Cr-50        321   0  5.30517E-07  293.6  end
'Cr-52        321   0  1.02189E-05  293.6  end
'Cr-53        321   0  1.15860E-06  293.6  end
'Cr-54        321   0  2.87821E-07  293.6  end
'Mn-55        321   0  6.48252E-06  293.6  end
'Fe-54        321   0  2.36804E-06  293.6  end
'Fe-56        321   0  3.71398E-05  293.6  end
'Fe-57        321   0  8.58163E-07  293.6  end
'Fe-58        321   0  1.13342E-07  293.6  end
'Cu-63        321   0  1.89046E-05  293.6  end
'Cu-65        321   0  8.42602E-06  293.6  end
 U-234        321   0  4.52789E-06  293.6  end
 U-235        321   0  4.36478E-04  293.6  end
 U-236        321   0  1.81117E-06  293.6  end
 U-238        321   0  2.44506E-05  293.6  end
 Pu-239       321  0  5.98421E-07 300 end
Pu-240        321  0  3.13646E-08 300 end
'      total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1          322   0  3.32434E-02  293.6  end
 O-16         322   0  1.80329E-02  293.6  end
'Mg-24        322   0  1.05686E-04  293.6  end
'Mg-25        322   0  1.33797E-05  293.6  end
'Mg-26        322   0  1.47310E-05  293.6  end
Al-27         322   0  2.79375E-02  293.6  end
'Si-28        322   0  1.00274E-04  293.6  end
'Si-29        322   0  5.07732E-06  293.6  end
'Si-30        322   0  3.37038E-06  293.6  end
'Ti-46        322   0  4.20262E-07  293.6  end
'Ti-47        322   0  3.79000E-07  293.6  end
'Ti-48        322   0  3.75536E-06  293.6  end
'Ti-49        322   0  2.75590E-07  293.6  end
'Ti-50        322   0  2.63873E-07  293.6  end
'Cr-50        322   0  5.30517E-07  293.6  end
'Cr-52        322   0  1.02189E-05  293.6  end
'Cr-53        322   0  1.15860E-06  293.6  end
'Cr-54        322   0  2.87821E-07  293.6  end
'Mn-55        322   0  6.44602E-06  293.6  end
'Fe-54        322   0  2.34704E-06  293.6  end
'Fe-56        322   0  3.68104E-05  293.6  end
'Fe-57        322   0  8.50550E-07  293.6  end
'Fe-58        322   0  1.12337E-07  293.6  end
'Cu-63        322   0  1.87830E-05  293.6  end
'Cu-65        322   0  8.37182E-06  293.6  end
 U-234        322   0  5.42167E-06  293.6  end
 U-235        322   0  5.19778E-04  293.6  end
 U-236        322   0  2.16868E-06  293.6  end
 U-238        322   0  2.92770E-05  293.6  end
 Pu-239       322  0  5.98421E-07 300 end
Pu-240        322  0  3.13646E-08 300 end
'      total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1          323   0  3.32434E-02  293.6  end
 O-16         323   0  1.82870E-02  293.6  end
'Mg-24        323   0  1.05686E-04  293.6  end
'Mg-25        323   0  1.33797E-05  293.6  end
'Mg-26        323   0  1.47310E-05  293.6  end
Al-27         323   0  2.76228E-02  293.6  end
'Si-28        323   0  9.95724E-05  293.6  end
'Si-29        323   0  5.04178E-06  293.6  end
'Si-30        323   0  3.34679E-06  293.6  end
'Ti-46        323   0  4.20262E-07  293.6  end
'Ti-47        323   0  3.79000E-07  293.6  end
'Ti-48        323   0  3.75536E-06  293.6  end
'Ti-49        323   0  2.75590E-07  293.6  end
'Ti-50        323   0  2.63873E-07  293.6  end
'Cr-50        323   0  5.30517E-07  293.6  end
'Cr-52        323   0  1.02189E-05  293.6  end
'Cr-53        323   0  1.15860E-06  293.6  end
'Cr-54        323   0  2.87821E-07  293.6  end
'Mn-55        323   0  6.40711E-06  293.6  end
'Fe-54        323   0  2.32464E-06  293.6  end
'Fe-56        323   0  3.64591E-05  293.6  end
'Fe-57        323   0  8.42433E-07  293.6  end
'Fe-58        323   0  1.11265E-07  293.6  end
'Cu-63        323   0  1.86534E-05  293.6  end
'Cu-65        323   0  8.31405E-06  293.6  end
 U-234        323   0  6.37446E-06  293.6  end
 U-235        323   0  6.08578E-04  293.6  end
 U-236        323   0  2.54980E-06  293.6  end
 U-238        323   0  3.44221E-05  293.6  end
 Pu-239       323  0  5.98421E-07 300 end
Pu-240        323  0  3.13646E-08 300 end
'      total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1          324   0  3.32434E-02  293.6  end
 O-16         324   0  1.85176E-02  293.6  end
'Mg-24        324   0  1.05686E-04  293.6  end
'Mg-25        324   0  1.33797E-05  293.6  end
'Mg-26        324   0  1.47310E-05  293.6  end
Al-27         324   0  2.73372E-02  293.6  end
'Si-28        324   0  9.89350E-05  293.6  end
'Si-29        324   0  5.00951E-06  293.6  end
'Si-30        324   0  3.32537E-06  293.6  end
'Ti-46        324   0  4.20262E-07  293.6  end
'Ti-47        324   0  3.79000E-07  293.6  end
'Ti-48        324   0  3.75536E-06  293.6  end
'Ti-49        324   0  2.75590E-07  293.6  end
'Ti-50        324   0  2.63873E-07  293.6  end
'Cr-50        324   0  5.30517E-07  293.6  end
'Cr-52        324   0  1.02189E-05  293.6  end
'Cr-53        324   0  1.15860E-06  293.6  end
'Cr-54        324   0  2.87821E-07  293.6  end
'Mn-55        324   0  6.37178E-06  293.6  end
'Fe-54        324   0  2.30432E-06  293.6  end
'Fe-56        324   0  3.61403E-05  293.6  end
'Fe-57        324   0  8.35068E-07  293.6  end
'Fe-58        324   0  1.10292E-07  293.6  end
'Cu-63        324   0  1.85357E-05  293.6  end
'Cu-65        324   0  8.26161E-06  293.6  end
 U-234        324   0  7.23926E-06  293.6  end
 U-235        324   0  6.89178E-04  293.6  end
 U-236        324   0  2.89573E-06  293.6  end
 U-238        324   0  3.90920E-05  293.6  end
 Pu-239       324  0  5.98421E-07 300 end
Pu-240        324  0  3.13646E-08 300 end
'      total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1          325   0  3.32434E-02  293.6  end
 O-16         325   0  1.84469E-02  293.6  end
'Mg-24        325   0  1.05686E-04  293.6  end
'Mg-25        325   0  1.33797E-05  293.6  end
'Mg-26        325   0  1.47310E-05  293.6  end
Al-27         325   0  2.74247E-02  293.6  end
'Si-28        325   0  9.91306E-05  293.6  end
'Si-29        325   0  5.01941E-06  293.6  end
'Si-30        325   0  3.33194E-06  293.6  end
'Ti-46        325   0  4.20262E-07  293.6  end
'Ti-47        325   0  3.79000E-07  293.6  end
'Ti-48        325   0  3.75536E-06  293.6  end
'Ti-49        325   0  2.75590E-07  293.6  end
'Ti-50        325   0  2.63873E-07  293.6  end
'Cr-50        325   0  5.30517E-07  293.6  end
'Cr-52        325   0  1.02189E-05  293.6  end
'Cr-53        325   0  1.15860E-06  293.6  end
'Cr-54        325   0  2.87821E-07  293.6  end
'Mn-55        325   0  6.38261E-06  293.6  end
'Fe-54        325   0  2.31055E-06  293.6  end
'Fe-56        325   0  3.62380E-05  293.6  end
'Fe-57        325   0  8.37326E-07  293.6  end
'Fe-58        325   0  1.10590E-07  293.6  end
'Cu-63        325   0  1.85717E-05  293.6  end
'Cu-65        325   0  8.27767E-06  293.6  end
 U-234        325   0  6.97424E-06  293.6  end
 U-235        325   0  6.64478E-04  293.6  end
 U-236        325   0  2.78972E-06  293.6  end
 U-238        325   0  3.76609E-05  293.6  end
 Pu-239       325  0  5.98421E-07 300 end
Pu-240        325  0  3.13646E-08 300 end
'      total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1          326   0  3.32434E-02  293.6  end
 O-16         326   0  1.81013E-02  293.6  end
'Mg-24        326   0  1.05686E-04  293.6  end
'Mg-25        326   0  1.33797E-05  293.6  end
'Mg-26        326   0  1.47310E-05  293.6  end
Al-27         326   0  2.78528E-02  293.6  end
'Si-28        326   0  1.00085E-04  293.6  end
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'Si-29          326   0   5.06774E-06   293.6   end
'Si-30          326   0   3.36403E-06   293.6   end
'Ti-46          326   0   4.20262E-07   293.6   end
'Ti-47          326   0   3.79000E-07   293.6   end
'Ti-48          326   0   3.75536E-06   293.6   end
'Ti-49          326   0   2.75590E-07   293.6   end
'Ti-50          326   0   2.63873E-07   293.6   end
'Cr-50          326   0   5.30517E-07   293.6   end
'Cr-52          326   0   1.02189E-05   293.6   end
'Cr-53          326   0   1.15860E-06   293.6   end
'Cr-54          326   0   2.87821E-07   293.6   end
'Mn-55          326   0   6.43555E-06   293.6   end
'Fe-54          326   0   2.34101E-06   293.6   end
'Fe-56          326   0   3.67158E-05   293.6   end
'Fe-57          326   0   8.48365E-07   293.6   end
'Fe-58          326   0   1.12048E-07   293.6   end
'Cu-63          326   0   1.87481E-05   293.6   end
'Cu-65          326   0   8.35629E-06   293.6   end
 U-234          326   0   5.67811E-06   293.6   end
 U-235          326   0   5.43678E-04   293.6   end
 U-236          326   0   2.27126E-06   293.6   end
 U-238          326   0   3.06618E-05   293.6   end
 Pu-239         326  0  5.98421E-07 300 end
Pu-240          326  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            327   0   3.32434E-02   293.6   end
 O-16           327   0   1.77731E-02   293.6   end
'Mg-24          327   0   1.05686E-04   293.6   end
'Mg-25          327   0   1.33797E-05   293.6   end
'Mg-26          327   0   1.47310E-05   293.6   end
Al-27           327   0   2.82593E-02   293.6   end
'Si-28          327   0   1.00993E-04   293.6   end
'Si-29          327   0   5.11370E-06   293.6   end
'Si-30          327   0   3.39453E-06   293.6   end
'Ti-46          327   0   4.20262E-07   293.6   end
'Ti-47          327   0   3.79000E-07   293.6   end
'Ti-48          327   0   3.75536E-06   293.6   end
'Ti-49          327   0   2.75590E-07   293.6   end
'Ti-50          327   0   2.63873E-07   293.6   end
'Cr-50          327   0   5.30517E-07   293.6   end
'Cr-52          327   0   1.02189E-05   293.6   end
'Cr-53          327   0   1.15860E-06   293.6   end
'Cr-54          327   0   2.87821E-07   293.6   end
'Mn-55          327   0   6.48581E-06   293.6   end
'Fe-54          327   0   2.36993E-06   293.6   end
'Fe-56          327   0   3.71695E-05   293.6   end
'Fe-57          327   0   8.58848E-07   293.6   end
'Fe-58          327   0   1.13433E-07   293.6   end
'Cu-63          327   0   1.89155E-05   293.6   end
'Cu-65          327   0   8.43090E-06   293.6   end
 U-234          327   0   4.44742E-06   293.6   end
 U-235          327   0   4.28978E-04   293.6   end
 U-236          327   0   1.77898E-06   293.6   end
 U-238          327   0   2.40161E-05   293.6   end
 Pu-239         327  0  5.98421E-07 300 end
Pu-240          327  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            328   0   3.32434E-02   293.6   end
 O-16           328   0   1.75562E-02   293.6   end
'Mg-24          328   0   1.05686E-04   293.6   end
'Mg-25          328   0   1.33797E-05   293.6   end
'Mg-26          328   0   1.47310E-05   293.6   end
Al-27           328   0   2.85280E-02   293.6   end
'Si-28          328   0   1.01591E-04   293.6   end
'Si-29          328   0   5.14401E-06   293.6   end
'Si-30          328   0   3.41465E-06   293.6   end
'Ti-46          328   0   4.20262E-07   293.6   end
'Ti-47          328   0   3.79000E-07   293.6   end
'Ti-48          328   0   3.75536E-06   293.6   end
'Ti-49          328   0   2.75590E-07   293.6   end
'Ti-50          328   0   2.63873E-07   293.6   end
'Cr-50          328   0   5.30517E-07   293.6   end
'Cr-52          328   0   1.02189E-05   293.6   end
'Cr-53          328   0   1.15860E-06   293.6   end
'Cr-54          328   0   2.87821E-07   293.6   end
'Mn-55          328   0   6.51903E-06   293.6   end
'Fe-54          328   0   2.38905E-06   293.6   end
'Fe-56          328   0   3.74693E-05   293.6   end
'Fe-57          328   0   8.65776E-07   293.6   end
'Fe-58          328   0   1.14348E-07   293.6   end
'Cu-63          328   0   1.90262E-05   293.6   end
'Cu-65          328   0   8.48022E-06   293.6   end
 U-234          328   0   3.63412E-06   293.6   end
 U-235          328   0   3.53178E-04   293.6   end
 U-236          328   0   1.45366E-06   293.6   end
 U-238          328   0   1.96242E-05   293.6   end
 Pu-239         328  0  5.98421E-07 300 end
Pu-240          328  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            329   0   3.32434E-02   293.6   end
 O-16           329   0   1.73591E-02   293.6   end
'Mg-24          329   0   1.05686E-04   293.6   end
'Mg-25          329   0   1.33797E-05   293.6   end
'Mg-26          329   0   1.47310E-05   293.6   end
Al-27           329   0   2.87722E-02   293.6   end
'Si-28          329   0   1.02136E-04   293.6   end
'Si-29          329   0   5.17160E-06   293.6   end
'Si-30          329   0   3.43297E-06   293.6   end
'Ti-46          329   0   4.20262E-07   293.6   end
'Ti-47          329   0   3.79000E-07   293.6   end
'Ti-48          329   0   3.75536E-06   293.6   end
'Ti-49          329   0   2.75590E-07   293.6   end
'Ti-50          329   0   2.63873E-07   293.6   end
'Cr-50          329   0   5.30517E-07   293.6   end
'Cr-52          329   0   1.02189E-05   293.6   end
'Cr-53          329   0   1.15860E-06   293.6   end
'Cr-54          329   0   2.87821E-07   293.6   end
'Mn-55          329   0   6.54922E-06   293.6   end
'Fe-54          329   0   2.40643E-06   293.6   end
'Fe-56          329   0   3.77418E-05   293.6   end
'Fe-57          329   0   8.72072E-07   293.6   end
'Fe-58          329   0   1.15179E-07   293.6   end
'Cu-63          329   0   1.91268E-05   293.6   end
'Cu-65          329   0   8.52504E-06   293.6   end
 U-234          329   0   2.89485E-06   293.6   end
 U-235          329   0   2.84278E-04   293.6   end
 U-236          329   0   1.15795E-06   293.6   end
 U-238          329   0   1.56322E-05   293.6   end
 Pu-239         329  0  5.98421E-07 300 end
Pu-240          329  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 3
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1            331   0   3.32434E-02   293.6   end
 O-16           331   0   1.77945E-02   293.6   end
'Mg-24          331   0   1.05686E-04   293.6   end
'Mg-25          331   0   1.33797E-05   293.6   end
'Mg-26          331   0   1.47310E-05   293.6   end
Al-27           331   0   2.82328E-02   293.6   end
'Si-28          331   0   1.00933E-04   293.6   end
'Si-29          331   0   5.11066E-06   293.6   end
'Si-30          331   0   3.39252E-06   293.6   end
'Ti-46          331   0   4.20262E-07   293.6   end
'Ti-47          331   0   3.79000E-07   293.6   end
'Ti-48          331   0   3.75536E-06   293.6   end
'Ti-49          331   0   2.75590E-07   293.6   end
'Ti-50          331   0   2.63873E-07   293.6   end
'Cr-50          331   0   5.30517E-07   293.6   end
'Cr-52          331   0   1.02189E-05   293.6   end
'Cr-53          331   0   1.15860E-06   293.6   end
'Cr-54          331   0   2.87821E-07   293.6   end
'Mn-55          331   0   6.48252E-06   293.6   end
'Fe-54          331   0   2.36804E-06   293.6   end
'Fe-56          331   0   3.71398E-05   293.6   end
'Fe-57          331   0   8.58163E-07   293.6   end
'Fe-58          331   0   1.13342E-07   293.6   end
'Cu-63          331   0   1.89046E-05   293.6   end
'Cu-65          331   0   8.42602E-06   293.6   end
 U-234          331   0   4.52789E-06   293.6   end
 U-235          331   0   4.36478E-04   293.6   end
 U-236          331   0   1.81117E-06   293.6   end
 U-238          331   0   2.44506E-05   293.6   end
 Pu-239         331  0  5.98421E-07 300 end
Pu-240          331  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1            332   0   3.32434E-02   293.6   end
 O-16           332   0   1.80329E-02   293.6   end
'Mg-24          332   0   1.05686E-04   293.6   end
'Mg-25          332   0   1.33797E-05   293.6   end
'Mg-26          332   0   1.47310E-05   293.6   end
Al-27           332   0   2.79375E-02   293.6   end
'Si-28          332   0   1.00274E-04   293.6   end
'Si-29          332   0   5.07732E-06   293.6   end
'Si-30          332   0   3.37038E-06   293.6   end
'Ti-46          332   0   4.20262E-07   293.6   end
'Ti-47          332   0   3.79000E-07   293.6   end
'Ti-48          332   0   3.75536E-06   293.6   end
'Ti-49          332   0   2.75590E-07   293.6   end
'Ti-50          332   0   2.63873E-07   293.6   end
'Cr-50          332   0   5.30517E-07   293.6   end
'Cr-52          332   0   1.02189E-05   293.6   end
'Cr-53          332   0   1.15860E-06   293.6   end
'Cr-54          332   0   2.87821E-07   293.6   end
'Mn-55          332   0   6.44602E-06   293.6   end
'Fe-54          332   0   2.34704E-06   293.6   end
'Fe-56          332   0   3.68104E-05   293.6   end
'Fe-57          332   0   8.50550E-07   293.6   end
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'Fe-58          332    0   1.12337E-07   293.6   end
'Cu-63          332    0   1.87830E-05   293.6   end
'Cu-65          332    0   8.37182E-06   293.6   end
 U-234          332    0   5.42167E-06   293.6   end
 U-235          332    0   5.19778E-04   293.6   end
 U-236          332    0   2.16868E-06   293.6   end
 U-238          332    0   2.92770E-05   293.6   end
 Pu-239         332  0  5.98421E-07 300 end
Pu-240         332  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1            333    0   3.32434E-02   293.6   end
 O-16           333    0   1.82870E-02   293.6   end
'Mg-24          333    0   1.05686E-04   293.6   end
'Mg-25          333    0   1.33797E-05   293.6   end
'Mg-26          333    0   1.47310E-05   293.6   end
Al-27           333    0   2.76228E-02   293.6   end
'Si-28          333    0   9.95724E-05   293.6   end
'Si-29          333    0   5.04178E-06   293.6   end
'Si-30          333    0   3.34679E-06   293.6   end
'Ti-46          333    0   4.20262E-07   293.6   end
'Ti-47          333    0   3.79000E-07   293.6   end
'Ti-48          333    0   3.75536E-06   293.6   end
'Ti-49          333    0   2.75590E-07   293.6   end
'Ti-50          333    0   2.63873E-07   293.6   end
'Cr-50          333    0   5.30517E-07   293.6   end
'Cr-52          333    0   1.02189E-05   293.6   end
'Cr-53          333    0   1.15860E-06   293.6   end
'Cr-54          333    0   2.87821E-07   293.6   end
'Mn-55          333    0   6.40711E-06   293.6   end
'Fe-54          333    0   2.32464E-06   293.6   end
'Fe-56          333    0   3.64591E-05   293.6   end
'Fe-57          333    0   8.42433E-07   293.6   end
'Fe-58          333    0   1.11265E-07   293.6   end
'Cu-63          333    0   1.86534E-05   293.6   end
'Cu-65          333    0   8.31405E-06   293.6   end
 U-234          333    0   6.37446E-06   293.6   end
 U-235          333    0   6.08578E-04   293.6   end
 U-236          333    0   2.54980E-06   293.6   end
 U-238          333    0   3.44221E-05   293.6   end
 Pu-239         333  0  5.98421E-07 300 end
Pu-240         333  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1            334    0   3.32434E-02   293.6   end
 O-16           334    0   1.85176E-02   293.6   end
'Mg-24          334    0   1.05686E-04   293.6   end
'Mg-25          334    0   1.33797E-05   293.6   end
'Mg-26          334    0   1.47310E-05   293.6   end
Al-27           334    0   2.73372E-02   293.6   end
'Si-28          334    0   9.89350E-05   293.6   end
'Si-29          334    0   5.00951E-06   293.6   end
'Si-30          334    0   3.32537E-06   293.6   end
'Ti-46          334    0   4.20262E-07   293.6   end
'Ti-47          334    0   3.79000E-07   293.6   end
'Ti-48          334    0   3.75536E-06   293.6   end
'Ti-49          334    0   2.75590E-07   293.6   end
'Ti-50          334    0   2.63873E-07   293.6   end
'Cr-50          334    0   5.30517E-07   293.6   end
'Cr-52          334    0   1.02189E-05   293.6   end
'Cr-53          334    0   1.15860E-06   293.6   end
'Cr-54          334    0   2.87821E-07   293.6   end
'Mn-55          334    0   6.37178E-06   293.6   end
'Fe-54          334    0   2.30432E-06   293.6   end
'Fe-56          334    0   3.61403E-05   293.6   end
'Fe-57          334    0   8.35068E-07   293.6   end
'Fe-58          334    0   1.10292E-07   293.6   end
'Cu-63          334    0   1.85357E-05   293.6   end
'Cu-65          334    0   8.26161E-06   293.6   end
 U-234          334    0   7.23926E-06   293.6   end
 U-235          334    0   6.89178E-04   293.6   end
 U-236          334    0   2.89573E-06   293.6   end
 U-238          334    0   3.90920E-05   293.6   end
 Pu-239         334  0  5.98421E-07 300 end
Pu-240         334  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1            335    0   3.32434E-02   293.6   end
 O-16           335    0   1.84469E-02   293.6   end
'Mg-24          335    0   1.05686E-04   293.6   end
'Mg-25          335    0   1.33797E-05   293.6   end
'Mg-26          335    0   1.47310E-05   293.6   end
Al-27           335    0   2.74247E-02   293.6   end
'Si-28          335    0   9.91306E-05   293.6   end
'Si-29          335    0   5.01941E-06   293.6   end
'Si-30          335    0   3.33194E-06   293.6   end
'Ti-46          335    0   4.20262E-07   293.6   end
'Ti-47          335    0   3.79000E-07   293.6   end
'Ti-48          335    0   3.75536E-06   293.6   end
'Ti-49          335    0   2.75590E-07   293.6   end
'Ti-50          335    0   2.63873E-07   293.6   end
'Cr-50          335    0   5.30517E-07   293.6   end
'Cr-52          335    0   1.02189E-05   293.6   end
'Cr-53          335    0   1.15860E-06   293.6   end
'Cr-54          335    0   2.87821E-07   293.6   end
'Mn-55          335    0   6.38261E-06   293.6   end
'Fe-54          335    0   2.31055E-06   293.6   end
'Fe-56          335    0   3.62380E-05   293.6   end
'Fe-57          335    0   8.37326E-07   293.6   end
'Fe-58          335    0   1.10590E-07   293.6   end
'Cu-63          335    0   1.85717E-05   293.6   end
'Cu-65          335    0   8.27767E-06   293.6   end
 U-234          335    0   6.97424E-06   293.6   end
 U-235          335    0   6.64478E-04   293.6   end
 U-236          335    0   2.78972E-06   293.6   end
 U-238          335    0   3.76609E-05   293.6   end
 Pu-239         335  0  5.98421E-07 300 end
Pu-240         335  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1            336    0   3.32434E-02   293.6   end
 O-16           336    0   1.81013E-02   293.6   end
'Mg-24          336    0   1.05686E-04   293.6   end
'Mg-25          336    0   1.33797E-05   293.6   end
'Mg-26          336    0   1.47310E-05   293.6   end
Al-27           336    0   2.78528E-02   293.6   end
'Si-28          336    0   1.00085E-04   293.6   end
'Si-29          336    0   5.06774E-06   293.6   end
'Si-30          336    0   3.36403E-06   293.6   end
'Ti-46          336    0   4.20262E-07   293.6   end
'Ti-47          336    0   3.79000E-07   293.6   end
'Ti-48          336    0   3.75536E-06   293.6   end
'Ti-49          336    0   2.75590E-07   293.6   end
'Ti-50          336    0   2.63873E-07   293.6   end
'Cr-50          336    0   5.30517E-07   293.6   end
'Cr-52          336    0   1.02189E-05   293.6   end
'Cr-53          336    0   1.15860E-06   293.6   end
'Cr-54          336    0   2.87821E-07   293.6   end
'Mn-55          336    0   6.43555E-06   293.6   end
'Fe-54          336    0   2.34101E-06   293.6   end
'Fe-56          336    0   3.67158E-05   293.6   end
'Fe-57          336    0   8.48365E-07   293.6   end
'Fe-58          336    0   1.12048E-07   293.6   end
'Cu-63          336    0   1.87481E-05   293.6   end
'Cu-65          336    0   8.35629E-06   293.6   end
 U-234          336    0   5.67811E-06   293.6   end
 U-235          336    0   5.43678E-04   293.6   end
 U-236          336    0   2.27126E-06   293.6   end
 U-238          336    0   3.06618E-05   293.6   end
 Pu-239         336  0  5.98421E-07 300 end
Pu-240         336  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            337    0   3.32434E-02   293.6   end
 O-16           337    0   1.77731E-02   293.6   end
'Mg-24          337    0   1.05686E-04   293.6   end
'Mg-25          337    0   1.33797E-05   293.6   end
'Mg-26          337    0   1.47310E-05   293.6   end
Al-27           337    0   2.82593E-02   293.6   end
'Si-28          337    0   1.00993E-04   293.6   end
'Si-29          337    0   5.11370E-06   293.6   end
'Si-30          337    0   3.39453E-06   293.6   end
'Ti-46          337    0   4.20262E-07   293.6   end
'Ti-47          337    0   3.79000E-07   293.6   end
'Ti-48          337    0   3.75536E-06   293.6   end
'Ti-49          337    0   2.75590E-07   293.6   end
'Ti-50          337    0   2.63873E-07   293.6   end
'Cr-50          337    0   5.30517E-07   293.6   end
'Cr-52          337    0   1.02189E-05   293.6   end
'Cr-53          337    0   1.15860E-06   293.6   end
'Cr-54          337    0   2.87821E-07   293.6   end
'Mn-55          337    0   6.48581E-06   293.6   end
'Fe-54          337    0   2.36993E-06   293.6   end
'Fe-56          337    0   3.71695E-05   293.6   end
'Fe-57          337    0   8.58848E-07   293.6   end
'Fe-58          337    0   1.13433E-07   293.6   end
'Cu-63          337    0   1.89155E-05   293.6   end
'Cu-65          337    0   8.43090E-06   293.6   end
 U-234          337    0   4.44742E-06   293.6   end
 U-235          337    0   4.28978E-04   293.6   end
 U-236          337    0   1.77898E-06   293.6   end
 U-238          337    0   2.40161E-05   293.6   end
 Pu-239         337  0  5.98421E-07 300 end
Pu-240         337  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            338    0   3.32434E-02   293.6   end
 O-16           338    0   1.75562E-02   293.6   end
'Mg-24          338    0   1.05686E-04   293.6   end
'Mg-25          338    0   1.33797E-05   293.6   end
'Mg-26          338    0   1.47310E-05   293.6   end
Al-27           338    0   2.85280E-02   293.6   end
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'Si-28          338    0   1.01591E-04   293.6   end
'Si-29          338    0   5.14401E-06   293.6   end
'Si-30          338    0   3.41465E-06   293.6   end
'Ti-46          338    0   4.20262E-07   293.6   end
'Ti-47          338    0   3.79000E-07   293.6   end
'Ti-48          338    0   3.75536E-06   293.6   end
'Ti-49          338    0   2.75590E-07   293.6   end
'Ti-50          338    0   2.63873E-07   293.6   end
'Cr-50          338    0   5.30517E-07   293.6   end
'Cr-52          338    0   1.02189E-05   293.6   end
'Cr-53          338    0   1.15860E-06   293.6   end
'Cr-54          338    0   2.87821E-07   293.6   end
'Mn-55          338    0   6.51903E-06   293.6   end
'Fe-54          338    0   2.38905E-06   293.6   end
'Fe-56          338    0   3.74693E-05   293.6   end
'Fe-57          338    0   8.65776E-07   293.6   end
'Fe-58          338    0   1.14348E-07   293.6   end
'Cu-63          338    0   1.90262E-05   293.6   end
'Cu-65          338    0   8.48022E-06   293.6   end
 U-234          338    0   3.63412E-06   293.6   end
 U-235          338    0   3.53178E-04   293.6   end
 U-236          338    0   1.45366E-06   293.6   end
 U-238          338    0   1.96242E-05   293.6   end
 Pu-239         338  0  5.98421E-07 300 end
Pu-240          338  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            339    0   3.32434E-02   293.6   end
 O-16           339    0   1.73591E-02   293.6   end
'Mg-24          339    0   1.05686E-04   293.6   end
'Mg-25          339    0   1.33797E-05   293.6   end
'Mg-26          339    0   1.47310E-05   293.6   end
Al-27           339    0   2.87722E-02   293.6   end
'Si-28          339    0   1.02136E-04   293.6   end
'Si-29          339    0   5.17160E-06   293.6   end
'Si-30          339    0   3.43297E-06   293.6   end
'Ti-46          339    0   4.20262E-07   293.6   end
'Ti-47          339    0   3.79000E-07   293.6   end
'Ti-48          339    0   3.75536E-06   293.6   end
'Ti-49          339    0   2.75590E-07   293.6   end
'Ti-50          339    0   2.63873E-07   293.6   end
'Cr-50          339    0   5.30517E-07   293.6   end
'Cr-52          339    0   1.02189E-05   293.6   end
'Cr-53          339    0   1.15860E-06   293.6   end
'Cr-54          339    0   2.87821E-07   293.6   end
'Mn-55          339    0   6.54922E-06   293.6   end
'Fe-54          339    0   2.40643E-06   293.6   end
'Fe-56          339    0   3.77418E-05   293.6   end
'Fe-57          339    0   8.72072E-07   293.6   end
'Fe-58          339    0   1.15179E-07   293.6   end
'Cu-63          339    0   1.91268E-05   293.6   end
'Cu-65          339    0   8.52504E-06   293.6   end
 U-234          339    0   2.89485E-06   293.6   end
 U-235          339    0   2.84278E-04   293.6   end
 U-236          339    0   1.15795E-06   293.6   end
 U-238          339    0   1.56322E-05   293.6   end
 Pu-239         339  0  5.98421E-07 300 end
Pu-240          339  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 4
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1            341    0   3.32434E-02   293.6   end
 O-16           341    0   1.77945E-02   293.6   end
'Mg-24          341    0   1.05686E-04   293.6   end
'Mg-25          341    0   1.33797E-05   293.6   end
'Mg-26          341    0   1.47310E-05   293.6   end
Al-27           341    0   2.82328E-02   293.6   end
'Si-28          341    0   1.00933E-04   293.6   end
'Si-29          341    0   5.11066E-06   293.6   end
'Si-30          341    0   3.39252E-06   293.6   end
'Ti-46          341    0   4.20262E-07   293.6   end
'Ti-47          341    0   3.79000E-07   293.6   end
'Ti-48          341    0   3.75536E-06   293.6   end
'Ti-49          341    0   2.75590E-07   293.6   end
'Ti-50          341    0   2.63873E-07   293.6   end
'Cr-50          341    0   5.30517E-07   293.6   end
'Cr-52          341    0   1.02189E-05   293.6   end
'Cr-53          341    0   1.15860E-06   293.6   end
'Cr-54          341    0   2.87821E-07   293.6   end
'Mn-55          341    0   6.48252E-06   293.6   end
'Fe-54          341    0   2.36804E-06   293.6   end
'Fe-56          341    0   3.71398E-05   293.6   end
'Fe-57          341    0   8.58163E-07   293.6   end
'Fe-58          341    0   1.13342E-07   293.6   end
'Cu-63          341    0   1.89046E-05   293.6   end
'Cu-65          341    0   8.42602E-06   293.6   end
 U-234          341    0   4.52789E-06   293.6   end
 U-235          341    0   4.36478E-04   293.6   end
 U-236          341    0   1.81117E-06   293.6   end
 U-238          341    0   2.44506E-05   293.6   end
 Pu-239         341  0  5.98421E-07 300 end
Pu-240          341  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1            342    0   3.32434E-02   293.6   end
 O-16           342    0   1.80329E-02   293.6   end
'Mg-24          342    0   1.05686E-04   293.6   end
'Mg-25          342    0   1.33797E-05   293.6   end
'Mg-26          342    0   1.47310E-05   293.6   end
Al-27           342    0   2.79375E-02   293.6   end
'Si-28          342    0   1.00274E-04   293.6   end
'Si-29          342    0   5.07732E-06   293.6   end
'Si-30          342    0   3.37038E-06   293.6   end
'Ti-46          342    0   4.20262E-07   293.6   end
'Ti-47          342    0   3.79000E-07   293.6   end
'Ti-48          342    0   3.75536E-06   293.6   end
'Ti-49          342    0   2.75590E-07   293.6   end
'Ti-50          342    0   2.63873E-07   293.6   end
'Cr-50          342    0   5.30517E-07   293.6   end
'Cr-52          342    0   1.02189E-05   293.6   end
'Cr-53          342    0   1.15860E-06   293.6   end
'Cr-54          342    0   2.87821E-07   293.6   end
'Mn-55          342    0   6.44602E-06   293.6   end
'Fe-54          342    0   2.34704E-06   293.6   end
'Fe-56          342    0   3.68104E-05   293.6   end
'Fe-57          342    0   8.50550E-07   293.6   end
'Fe-58          342    0   1.12337E-07   293.6   end
'Cu-63          342    0   1.87830E-05   293.6   end
'Cu-65          342    0   8.37182E-06   293.6   end
 U-234          342    0   5.42167E-06   293.6   end
 U-235          342    0   5.19778E-04   293.6   end
 U-236          342    0   2.16868E-06   293.6   end
 U-238          342    0   2.92770E-05   293.6   end
 Pu-239         342  0  5.98421E-07 300 end
Pu-240          342  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1            343    0   3.32434E-02   293.6   end
 O-16           343    0   1.82870E-02   293.6   end
'Mg-24          343    0   1.05686E-04   293.6   end
'Mg-25          343    0   1.33797E-05   293.6   end
'Mg-26          343    0   1.47310E-05   293.6   end
Al-27           343    0   2.76228E-02   293.6   end
'Si-28          343    0   9.95724E-05   293.6   end
'Si-29          343    0   5.04178E-06   293.6   end
'Si-30          343    0   3.34679E-06   293.6   end
'Ti-46          343    0   4.20262E-07   293.6   end
'Ti-47          343    0   3.79000E-07   293.6   end
'Ti-48          343    0   3.75536E-06   293.6   end
'Ti-49          343    0   2.75590E-07   293.6   end
'Ti-50          343    0   2.63873E-07   293.6   end
'Cr-50          343    0   5.30517E-07   293.6   end
'Cr-52          343    0   1.02189E-05   293.6   end
'Cr-53          343    0   1.15860E-06   293.6   end
'Cr-54          343    0   2.87821E-07   293.6   end
'Mn-55          343    0   6.40711E-06   293.6   end
'Fe-54          343    0   2.32464E-06   293.6   end
'Fe-56          343    0   3.64591E-05   293.6   end
'Fe-57          343    0   8.42433E-07   293.6   end
'Fe-58          343    0   1.11265E-07   293.6   end
'Cu-63          343    0   1.86534E-05   293.6   end
'Cu-65          343    0   8.31405E-06   293.6   end
 U-234          343    0   6.37446E-06   293.6   end
 U-235          343    0   6.08578E-04   293.6   end
 U-236          343    0   2.54980E-06   293.6   end
 U-238          343    0   3.44221E-05   293.6   end
 Pu-239         343  0  5.98421E-07 300 end
Pu-240          343  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1            344    0   3.32434E-02   293.6   end
 O-16           344    0   1.85176E-02   293.6   end
'Mg-24          344    0   1.05686E-04   293.6   end
'Mg-25          344    0   1.33797E-05   293.6   end
'Mg-26          344    0   1.47310E-05   293.6   end
Al-27           344    0   2.73372E-02   293.6   end
'Si-28          344    0   9.89350E-05   293.6   end
'Si-29          344    0   5.00951E-06   293.6   end
'Si-30          344    0   3.32537E-06   293.6   end
'Ti-46          344    0   4.20262E-07   293.6   end
'Ti-47          344    0   3.79000E-07   293.6   end
'Ti-48          344    0   3.75536E-06   293.6   end
'Ti-49          344    0   2.75590E-07   293.6   end
'Ti-50          344    0   2.63873E-07   293.6   end
'Cr-50          344    0   5.30517E-07   293.6   end
'Cr-52          344    0   1.02189E-05   293.6   end
'Cr-53          344    0   1.15860E-06   293.6   end
'Cr-54          344    0   2.87821E-07   293.6   end
'Mn-55          344    0   6.37178E-06   293.6   end
'Fe-54          344    0   2.30432E-06   293.6   end
'Fe-56          344    0   3.61403E-05   293.6   end
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'Fe-57          344    0   8.35068E-07   293.6   end
'Fe-58          344    0   1.10292E-07   293.6   end
'Cu-63          344    0   1.85357E-05   293.6   end
'Cu-65          344    0   8.26161E-06   293.6   end
 U-234          344    0   7.23926E-06   293.6   end
 U-235          344    0   6.89178E-04   293.6   end
 U-236          344    0   2.89573E-06   293.6   end
 U-238          344    0   3.90920E-05   293.6   end
 Pu-239         344  0  5.98421E-07 300 end
Pu-240          344  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1            345    0   3.32434E-02   293.6   end
 O-16           345    0   1.84469E-02   293.6   end
'Mg-24          345    0   1.05686E-04   293.6   end
'Mg-25          345    0   1.33797E-05   293.6   end
'Mg-26          345    0   1.47310E-05   293.6   end
Al-27           345    0   2.74247E-02   293.6   end
'Si-28          345    0   9.91306E-05   293.6   end
'Si-29          345    0   5.01941E-06   293.6   end
'Si-30          345    0   3.33194E-06   293.6   end
'Ti-46          345    0   4.20262E-07   293.6   end
'Ti-47          345    0   3.79000E-07   293.6   end
'Ti-48          345    0   3.75536E-06   293.6   end
'Ti-49          345    0   2.75590E-07   293.6   end
'Ti-50          345    0   2.63873E-07   293.6   end
'Cr-50          345    0   5.30517E-07   293.6   end
'Cr-52          345    0   1.02189E-05   293.6   end
'Cr-53          345    0   1.15860E-06   293.6   end
'Cr-54          345    0   2.87821E-07   293.6   end
'Mn-55          345    0   6.38261E-06   293.6   end
'Fe-54          345    0   2.31055E-06   293.6   end
'Fe-56          345    0   3.62380E-05   293.6   end
'Fe-57          345    0   8.37326E-07   293.6   end
'Fe-58          345    0   1.10590E-07   293.6   end
'Cu-63          345    0   1.85717E-05   293.6   end
'Cu-65          345    0   8.27767E-06   293.6   end
 U-234          345    0   6.97424E-06   293.6   end
 U-235          345    0   6.64478E-04   293.6   end
 U-236          345    0   2.78972E-06   293.6   end
 U-238          345    0   3.76609E-05   293.6   end
 Pu-239         345  0  5.98421E-07 300 end
Pu-240          345  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1            346    0   3.32434E-02   293.6   end
 O-16           346    0   1.81013E-02   293.6   end
'Mg-24          346    0   1.05686E-04   293.6   end
'Mg-25          346    0   1.33797E-05   293.6   end
'Mg-26          346    0   1.47310E-05   293.6   end
Al-27           346    0   2.78528E-02   293.6   end
'Si-28          346    0   1.00085E-04   293.6   end
'Si-29          346    0   5.06774E-06   293.6   end
'Si-30          346    0   3.36403E-06   293.6   end
'Ti-46          346    0   4.20262E-07   293.6   end
'Ti-47          346    0   3.79000E-07   293.6   end
'Ti-48          346    0   3.75536E-06   293.6   end
'Ti-49          346    0   2.75590E-07   293.6   end
'Ti-50          346    0   2.63873E-07   293.6   end
'Cr-50          346    0   5.30517E-07   293.6   end
'Cr-52          346    0   1.02189E-05   293.6   end
'Cr-53          346    0   1.15860E-06   293.6   end
'Cr-54          346    0   2.87821E-07   293.6   end
'Mn-55          346    0   6.43555E-06   293.6   end
'Fe-54          346    0   2.34101E-06   293.6   end
'Fe-56          346    0   3.67158E-05   293.6   end
'Fe-57          346    0   8.48365E-07   293.6   end
'Fe-58          346    0   1.12048E-07   293.6   end
'Cu-63          346    0   1.87481E-05   293.6   end
'Cu-65          346    0   8.35629E-06   293.6   end
 U-234          346    0   5.67811E-06   293.6   end
 U-235          346    0   5.43678E-04   293.6   end
 U-236          346    0   2.27126E-06   293.6   end
 U-238          346    0   3.06618E-05   293.6   end
 Pu-239         346  0  5.98421E-07 300 end
Pu-240          346  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            347    0   3.32434E-02   293.6   end
 O-16           347    0   1.77731E-02   293.6   end
'Mg-24          347    0   1.05686E-04   293.6   end
'Mg-25          347    0   1.33797E-05   293.6   end
'Mg-26          347    0   1.47310E-05   293.6   end
Al-27           347    0   2.82593E-02   293.6   end
'Si-28          347    0   1.00993E-04   293.6   end
'Si-29          347    0   5.11370E-06   293.6   end
'Si-30          347    0   3.39453E-06   293.6   end
'Ti-46          347    0   4.20262E-07   293.6   end
'Ti-47          347    0   3.79000E-07   293.6   end
'Ti-48          347    0   3.75536E-06   293.6   end
'Ti-49          347    0   2.75590E-07   293.6   end
'Ti-50          347    0   2.63873E-07   293.6   end
'Cr-50          347    0   5.30517E-07   293.6   end
'Cr-52          347    0   1.02189E-05   293.6   end
'Cr-53          347    0   1.15860E-06   293.6   end
'Cr-54          347    0   2.87821E-07   293.6   end
'Mn-55          347    0   6.48581E-06   293.6   end
'Fe-54          347    0   2.36993E-06   293.6   end
'Fe-56          347    0   3.71695E-05   293.6   end
'Fe-57          347    0   8.58848E-07   293.6   end
'Fe-58          347    0   1.13433E-07   293.6   end
'Cu-63          347    0   1.89155E-05   293.6   end
'Cu-65          347    0   8.43090E-06   293.6   end
 U-234          347    0   4.44742E-06   293.6   end
 U-235          347    0   4.28978E-04   293.6   end
 U-236          347    0   1.77898E-06   293.6   end
 U-238          347    0   2.40161E-05   293.6   end
 Pu-239         347  0  5.98421E-07 300 end
Pu-240          347  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            348    0   3.32434E-02   293.6   end
 O-16           348    0   1.75562E-02   293.6   end
'Mg-24          348    0   1.05686E-04   293.6   end
'Mg-25          348    0   1.33797E-05   293.6   end
'Mg-26          348    0   1.47310E-05   293.6   end
Al-27           348    0   2.85280E-02   293.6   end
'Si-28          348    0   1.01591E-04   293.6   end
'Si-29          348    0   5.14401E-06   293.6   end
'Si-30          348    0   3.41465E-06   293.6   end
'Ti-46          348    0   4.20262E-07   293.6   end
'Ti-47          348    0   3.79000E-07   293.6   end
'Ti-48          348    0   3.75536E-06   293.6   end
'Ti-49          348    0   2.75590E-07   293.6   end
'Ti-50          348    0   2.63873E-07   293.6   end
'Cr-50          348    0   5.30517E-07   293.6   end
'Cr-52          348    0   1.02189E-05   293.6   end
'Cr-53          348    0   1.15860E-06   293.6   end
'Cr-54          348    0   2.87821E-07   293.6   end
'Mn-55          348    0   6.51903E-06   293.6   end
'Fe-54          348    0   2.38905E-06   293.6   end
'Fe-56          348    0   3.74693E-05   293.6   end
'Fe-57          348    0   8.65776E-07   293.6   end
'Fe-58          348    0   1.14348E-07   293.6   end
'Cu-63          348    0   1.90262E-05   293.6   end
'Cu-65          348    0   8.48022E-06   293.6   end
 U-234          348    0   3.63412E-06   293.6   end
 U-235          348    0   3.53178E-04   293.6   end
 U-236          348    0   1.45366E-06   293.6   end
 U-238          348    0   1.96242E-05   293.6   end
 Pu-239         348  0  5.98421E-07 300 end
Pu-240          348  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            349    0   3.32434E-02   293.6   end
 O-16           349    0   1.73591E-02   293.6   end
'Mg-24          349    0   1.05686E-04   293.6   end
'Mg-25          349    0   1.33797E-05   293.6   end
'Mg-26          349    0   1.47310E-05   293.6   end
Al-27           349    0   2.87722E-02   293.6   end
'Si-28          349    0   1.02136E-04   293.6   end
'Si-29          349    0   5.17160E-06   293.6   end
'Si-30          349    0   3.43297E-06   293.6   end
'Ti-46          349    0   4.20262E-07   293.6   end
'Ti-47          349    0   3.79000E-07   293.6   end
'Ti-48          349    0   3.75536E-06   293.6   end
'Ti-49          349    0   2.75590E-07   293.6   end
'Ti-50          349    0   2.63873E-07   293.6   end
'Cr-50          349    0   5.30517E-07   293.6   end
'Cr-52          349    0   1.02189E-05   293.6   end
'Cr-53          349    0   1.15860E-06   293.6   end
'Cr-54          349    0   2.87821E-07   293.6   end
'Mn-55          349    0   6.54922E-06   293.6   end
'Fe-54          349    0   2.40643E-06   293.6   end
'Fe-56          349    0   3.77418E-05   293.6   end
'Fe-57          349    0   8.72072E-07   293.6   end
'Fe-58          349    0   1.15179E-07   293.6   end
'Cu-63          349    0   1.91268E-05   293.6   end
'Cu-65          349    0   8.52504E-06   293.6   end
 U-234          349    0   2.89485E-06   293.6   end
 U-235          349    0   2.84278E-04   293.6   end
 U-236          349    0   1.15795E-06   293.6   end
 U-238          349    0   1.56322E-05   293.6   end
 Pu-239         349  0  5.98421E-07 300 end
Pu-240          349  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1            351    0   3.32434E-02   293.6   end
 O-16           351    0   1.77945E-02   293.6   end
'Mg-24          351    0   1.05686E-04   293.6   end
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'Mg-25        351   0  1.33797E-05  293.6  end
'Mg-26        351   0  1.47310E-05  293.6  end
Al-27         351   0  2.82328E-02  293.6  end
'Si-28        351   0  1.00933E-04  293.6  end
'Si-29        351   0  5.11066E-06  293.6  end
'Si-30        351   0  3.39252E-06  293.6  end
'Ti-46        351   0  4.20262E-07  293.6  end
'Ti-47        351   0  3.79000E-07  293.6  end
'Ti-48        351   0  3.75536E-06  293.6  end
'Ti-49        351   0  2.75590E-07  293.6  end
'Ti-50        351   0  2.63873E-07  293.6  end
'Cr-50        351   0  5.30517E-07  293.6  end
'Cr-52        351   0  1.02189E-05  293.6  end
'Cr-53        351   0  1.15860E-06  293.6  end
'Cr-54        351   0  2.87821E-07  293.6  end
'Mn-55        351   0  6.48252E-06  293.6  end
'Fe-54        351   0  2.36804E-06  293.6  end
'Fe-56        351   0  3.71398E-05  293.6  end
'Fe-57        351   0  8.58163E-07  293.6  end
'Fe-58        351   0  1.13342E-07  293.6  end
'Cu-63        351   0  1.89046E-05  293.6  end
'Cu-65        351   0  8.42602E-06  293.6  end
 U-234        351   0  4.52789E-06  293.6  end
 U-235        351   0  4.36478E-04  293.6  end
 U-236        351   0  1.81117E-06  293.6  end
 U-238        351   0  2.44506E-05  293.6  end
 Pu-239       351  0  5.98421E-07 300 end
Pu-240        351  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
' 8.008950E-02
 H-1          352   0  3.32434E-02  293.6  end
 O-16         352   0  1.80329E-02  293.6  end
'Mg-24        352   0  1.05686E-04  293.6  end
'Mg-25        352   0  1.33797E-05  293.6  end
'Mg-26        352   0  1.47310E-05  293.6  end
Al-27         352   0  2.79375E-02  293.6  end
'Si-28        352   0  1.00274E-04  293.6  end
'Si-29        352   0  5.07732E-06  293.6  end
'Si-30        352   0  3.37038E-06  293.6  end
'Ti-46        352   0  4.20262E-07  293.6  end
'Ti-47        352   0  3.79000E-07  293.6  end
'Ti-48        352   0  3.75536E-06  293.6  end
'Ti-49        352   0  2.75590E-07  293.6  end
'Ti-50        352   0  2.63873E-07  293.6  end
'Cr-50        352   0  5.30517E-07  293.6  end
'Cr-52        352   0  1.02189E-05  293.6  end
'Cr-53        352   0  1.15860E-06  293.6  end
'Cr-54        352   0  2.87821E-07  293.6  end
'Mn-55        352   0  6.44602E-06  293.6  end
'Fe-54        352   0  2.34704E-06  293.6  end
'Fe-56        352   0  3.68104E-05  293.6  end
'Fe-57        352   0  8.50550E-07  293.6  end
'Fe-58        352   0  1.12337E-07  293.6  end
'Cu-63        352   0  1.87830E-05  293.6  end
'Cu-65        352   0  8.37182E-06  293.6  end
 U-234        352   0  5.42167E-06  293.6  end
 U-235        352   0  5.19778E-04  293.6  end
 U-236        352   0  2.16868E-06  293.6  end
 U-238        352   0  2.92770E-05  293.6  end
 Pu-239       352  0  5.98421E-07 300 end
Pu-240        352  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
' 8.012280E-02
 H-1          353   0  3.32434E-02  293.6  end
 O-16         353   0  1.82870E-02  293.6  end
'Mg-24        353   0  1.05686E-04  293.6  end
'Mg-25        353   0  1.33797E-05  293.6  end
'Mg-26        353   0  1.47310E-05  293.6  end
Al-27         353   0  2.76228E-02  293.6  end
'Si-28        353   0  9.95724E-05  293.6  end
'Si-29        353   0  5.04178E-06  293.6  end
'Si-30        353   0  3.34679E-06  293.6  end
'Ti-46        353   0  4.20262E-07  293.6  end
'Ti-47        353   0  3.79000E-07  293.6  end
'Ti-48        353   0  3.75536E-06  293.6  end
'Ti-49        353   0  2.75590E-07  293.6  end
'Ti-50        353   0  2.63873E-07  293.6  end
'Cr-50        353   0  5.30517E-07  293.6  end
'Cr-52        353   0  1.02189E-05  293.6  end
'Cr-53        353   0  1.15860E-06  293.6  end
'Cr-54        353   0  2.87821E-07  293.6  end
'Mn-55        353   0  6.40711E-06  293.6  end
'Fe-54        353   0  2.32464E-06  293.6  end
'Fe-56        353   0  3.64591E-05  293.6  end
'Fe-57        353   0  8.42433E-07  293.6  end
'Fe-58        353   0  1.11265E-07  293.6  end
'Cu-63        353   0  1.86534E-05  293.6  end
'Cu-65        353   0  8.31405E-06  293.6  end
 U-234        353   0  6.37446E-06  293.6  end
 U-235        353   0  6.08578E-04  293.6  end
 U-236        353   0  2.54980E-06  293.6  end
 U-238        353   0  3.44221E-05  293.6  end
 Pu-239       353  0  5.98421E-07 300 end
Pu-240        353  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
' 8.015300E-02
 H-1          354   0  3.32434E-02  293.6  end
 O-16         354   0  1.85176E-02  293.6  end
'Mg-24        354   0  1.05686E-04  293.6  end
'Mg-25        354   0  1.33797E-05  293.6  end
'Mg-26        354   0  1.47310E-05  293.6  end
Al-27         354   0  2.73372E-02  293.6  end
'Si-28        354   0  9.89350E-05  293.6  end
'Si-29        354   0  5.00951E-06  293.6  end
'Si-30        354   0  3.32537E-06  293.6  end
'Ti-46        354   0  4.20262E-07  293.6  end
'Ti-47        354   0  3.79000E-07  293.6  end
'Ti-48        354   0  3.75536E-06  293.6  end
'Ti-49        354   0  2.75590E-07  293.6  end
'Ti-50        354   0  2.63873E-07  293.6  end
'Cr-50        354   0  5.30517E-07  293.6  end
'Cr-52        354   0  1.02189E-05  293.6  end
'Cr-53        354   0  1.15860E-06  293.6  end
'Cr-54        354   0  2.87821E-07  293.6  end
'Mn-55        354   0  6.37178E-06  293.6  end
'Fe-54        354   0  2.30432E-06  293.6  end
'Fe-56        354   0  3.61403E-05  293.6  end
'Fe-57        354   0  8.35068E-07  293.6  end
'Fe-58        354   0  1.10292E-07  293.6  end
'Cu-63        354   0  1.85357E-05  293.6  end
'Cu-65        354   0  8.26161E-06  293.6  end
 U-234        354   0  7.23926E-06  293.6  end
 U-235        354   0  6.89178E-04  293.6  end
 U-236        354   0  2.89573E-06  293.6  end
 U-238        354   0  3.90920E-05  293.6  end
 Pu-239       354  0  5.98421E-07 300 end
Pu-240        354  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
' 8.014370E-02
 H-1          355   0  3.32434E-02  293.6  end
 O-16         355   0  1.84469E-02  293.6  end
'Mg-24        355   0  1.05686E-04  293.6  end
'Mg-25        355   0  1.33797E-05  293.6  end
'Mg-26        355   0  1.47310E-05  293.6  end
Al-27         355   0  2.74247E-02  293.6  end
'Si-28        355   0  9.91306E-05  293.6  end
'Si-29        355   0  5.01941E-06  293.6  end
'Si-30        355   0  3.33194E-06  293.6  end
'Ti-46        355   0  4.20262E-07  293.6  end
'Ti-47        355   0  3.79000E-07  293.6  end
'Ti-48        355   0  3.75536E-06  293.6  end
'Ti-49        355   0  2.75590E-07  293.6  end
'Ti-50        355   0  2.63873E-07  293.6  end
'Cr-50        355   0  5.30517E-07  293.6  end
'Cr-52        355   0  1.02189E-05  293.6  end
'Cr-53        355   0  1.15860E-06  293.6  end
'Cr-54        355   0  2.87821E-07  293.6  end
'Mn-55        355   0  6.38261E-06  293.6  end
'Fe-54        355   0  2.31055E-06  293.6  end
'Fe-56        355   0  3.62380E-05  293.6  end
'Fe-57        355   0  8.37326E-07  293.6  end
'Fe-58        355   0  1.10590E-07  293.6  end
'Cu-63        355   0  1.85717E-05  293.6  end
'Cu-65        355   0  8.27767E-06  293.6  end
 U-234        355   0  6.97424E-06  293.6  end
 U-235        355   0  6.64478E-04  293.6  end
 U-236        355   0  2.78972E-06  293.6  end
 U-238        355   0  3.76609E-05  293.6  end.
 Pu-239       355  0  5.98421E-07 300 end
Pu-240        355  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
' 8.009850E-02
 H-1          356   0  3.32434E-02  293.6  end
 O-16         356   0  1.81013E-02  293.6  end
'Mg-24        356   0  1.05686E-04  293.6  end
'Mg-25        356   0  1.33797E-05  293.6  end
'Mg-26        356   0  1.47310E-05  293.6  end
Al-27         356   0  2.78528E-02  293.6  end
'Si-28        356   0  1.00085E-04  293.6  end
'Si-29        356   0  5.06774E-06  293.6  end
'Si-30        356   0  3.36403E-06  293.6  end
'Ti-46        356   0  4.20262E-07  293.6  end
'Ti-47        356   0  3.79000E-07  293.6  end
'Ti-48        356   0  3.75536E-06  293.6  end
'Ti-49        356   0  2.75590E-07  293.6  end
'Ti-50        356   0  2.63873E-07  293.6  end
'Cr-50        356   0  5.30517E-07  293.6  end
'Cr-52        356   0  1.02189E-05  293.6  end
'Cr-53        356   0  1.15860E-06  293.6  end
'Cr-54        356   0  2.87821E-07  293.6  end
'Mn-55        356   0  6.43555E-06  293.6  end
'Fe-54        356   0  2.34101E-06  293.6  end
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'Fe-56          356   0   3.67158E-05   293.6   end
'Fe-57          356   0   8.48365E-07   293.6   end
'Fe-58          356   0   1.12048E-07   293.6   end
'Cu-63          356   0   1.87481E-05   293.6   end
'Cu-65          356   0   8.35629E-06   293.6   end
 U-234          356   0   5.67811E-06   293.6   end
 U-235          356   0   5.43678E-04   293.6   end
 U-236          356   0   2.27126E-06   293.6   end
 U-238          356   0   3.06618E-05   293.6   end
 Pu-239         356  0  5.98421E-07 300 end
Pu-240          356  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            357   0   3.32434E-02   293.6   end
 O-16           357   0   1.77731E-02   293.6   end
'Mg-24          357   0   1.05686E-04   293.6   end
'Mg-25          357   0   1.33797E-05   293.6   end
'Mg-26          357   0   1.47310E-05   293.6   end
Al-27           357   0   2.82593E-02   293.6   end
'Si-28          357   0   1.00993E-04   293.6   end
'Si-29          357   0   5.11370E-06   293.6   end
'Si-30          357   0   3.39453E-06   293.6   end
'Ti-46          357   0   4.20262E-07   293.6   end
'Ti-47          357   0   3.79000E-07   293.6   end
'Ti-48          357   0   3.75536E-06   293.6   end
'Ti-49          357   0   2.75590E-07   293.6   end
'Ti-50          357   0   2.63873E-07   293.6   end
'Cr-50          357   0   5.30517E-07   293.6   end
'Cr-52          357   0   1.02189E-05   293.6   end
'Cr-53          357   0   1.15860E-06   293.6   end
'Cr-54          357   0   2.87821E-07   293.6   end
'Mn-55          357   0   6.48581E-06   293.6   end
'Fe-54          357   0   2.36993E-06   293.6   end
'Fe-56          357   0   3.71695E-05   293.6   end
'Fe-57          357   0   8.58848E-07   293.6   end
'Fe-58          357   0   1.13433E-07   293.6   end
'Cu-63          357   0   1.89155E-05   293.6   end
'Cu-65          357   0   8.43090E-06   293.6   end
 U-234          357   0   4.44742E-06   293.6   end
 U-235          357   0   4.28978E-04   293.6   end
 U-236          357   0   1.77898E-06   293.6   end
 U-238          357   0   2.40161E-05   293.6   end
 Pu-239         357  0  5.98421E-07 300 end
Pu-240          357  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            358   0   3.32434E-02   293.6   end
 O-16           358   0   1.75562E-02   293.6   end
'Mg-24          358   0   1.05686E-04   293.6   end
'Mg-25          358   0   1.33797E-05   293.6   end
'Mg-26          358   0   1.47310E-05   293.6   end
Al-27           358   0   2.85280E-02   293.6   end
'Si-28          358   0   1.01591E-04   293.6   end
'Si-29          358   0   5.14401E-06   293.6   end
'Si-30          358   0   3.41465E-06   293.6   end
'Ti-46          358   0   4.20262E-07   293.6   end
'Ti-47          358   0   3.79000E-07   293.6   end
'Ti-48          358   0   3.75536E-06   293.6   end
'Ti-49          358   0   2.75590E-07   293.6   end
'Ti-50          358   0   2.63873E-07   293.6   end
'Cr-50          358   0   5.30517E-07   293.6   end
'Cr-52          358   0   1.02189E-05   293.6   end
'Cr-53          358   0   1.15860E-06   293.6   end
'Cr-54          358   0   2.87821E-07   293.6   end
'Mn-55          358   0   6.51903E-06   293.6   end
'Fe-54          358   0   2.38905E-06   293.6   end
'Fe-56          358   0   3.74693E-05   293.6   end
'Fe-57          358   0   8.65776E-07   293.6   end
'Fe-58          358   0   1.14348E-07   293.6   end
'Cu-63          358   0   1.90262E-05   293.6   end
'Cu-65          358   0   8.48022E-06   293.6   end
 U-234          358   0   3.63412E-06   293.6   end
 U-235          358   0   3.53178E-04   293.6   end
 U-236          358   0   1.45366E-06   293.6   end
 U-238          358   0   1.96242E-05   293.6   end
 Pu-239         358  0  5.98421E-07 300 end
Pu-240          358  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            359   0   3.32434E-02   293.6   end
 O-16           359   0   1.73591E-02   293.6   end
'Mg-24          359   0   1.05686E-04   293.6   end
'Mg-25          359   0   1.33797E-05   293.6   end
'Mg-26          359   0   1.47310E-05   293.6   end
Al-27           359   0   2.87722E-02   293.6   end
'Si-28          359   0   1.02136E-04   293.6   end
'Si-29          359   0   5.17160E-06   293.6   end
'Si-30          359   0   3.43297E-06   293.6   end
'Ti-46          359   0   4.20262E-07   293.6   end
'Ti-47          359   0   3.79000E-07   293.6   end
'Ti-48          359   0   3.75536E-06   293.6   end
'Ti-49          359   0   2.75590E-07   293.6   end
'Ti-50          359   0   2.63873E-07   293.6   end
'Cr-50          359   0   5.30517E-07   293.6   end
'Cr-52          359   0   1.02189E-05   293.6   end
'Cr-53          359   0   1.15860E-06   293.6   end
'Cr-54          359   0   2.87821E-07   293.6   end
'Mn-55          359   0   6.54922E-06   293.6   end
'Fe-54          359   0   2.40643E-06   293.6   end
'Fe-56          359   0   3.77418E-05   293.6   end
'Fe-57          359   0   8.72072E-07   293.6   end
'Fe-58          359   0   1.15179E-07   293.6   end
'Cu-63          359   0   1.91268E-05   293.6   end
'Cu-65          359   0   8.52504E-06   293.6   end
 U-234          359   0   2.89485E-06   293.6   end
 U-235          359   0   2.84278E-04   293.6   end
 U-236          359   0   1.15795E-06   293.6   end
 U-238          359   0   1.56322E-05   293.6   end
 Pu-239         359  0  5.98421E-07 300 end
Pu-240          359  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 6
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1            361   0   3.32434E-02   293.6   end
 O-16           361   0   1.77945E-02   293.6   end
'Mg-24          361   0   1.05686E-04   293.6   end
'Mg-25          361   0   1.33797E-05   293.6   end
'Mg-26          361   0   1.47310E-05   293.6   end
Al-27           361   0   2.82328E-02   293.6   end
'Si-28          361   0   1.00933E-04   293.6   end
'Si-29          361   0   5.11066E-06   293.6   end
'Si-30          361   0   3.39252E-06   293.6   end
'Ti-46          361   0   4.20262E-07   293.6   end
'Ti-47          361   0   3.79000E-07   293.6   end
'Ti-48          361   0   3.75536E-06   293.6   end
'Ti-49          361   0   2.75590E-07   293.6   end
'Ti-50          361   0   2.63873E-07   293.6   end
'Cr-50          361   0   5.30517E-07   293.6   end
'Cr-52          361   0   1.02189E-05   293.6   end
'Cr-53          361   0   1.15860E-06   293.6   end
'Cr-54          361   0   2.87821E-07   293.6   end
'Mn-55          361   0   6.48252E-06   293.6   end
'Fe-54          361   0   2.36804E-06   293.6   end
'Fe-56          361   0   3.71398E-05   293.6   end
'Fe-57          361   0   8.58163E-07   293.6   end
'Fe-58          361   0   1.13342E-07   293.6   end
'Cu-63          361   0   1.89046E-05   293.6   end
'Cu-65          361   0   8.42602E-06   293.6   end
 U-234          361   0   4.52789E-06   293.6   end
 U-235          361   0   4.36478E-04   293.6   end
 U-236          361   0   1.81117E-06   293.6   end
 U-238          361   0   2.44506E-05   293.6   end
 Pu-239         361  0  5.98421E-07 300 end
Pu-240          361  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1            362   0   3.32434E-02   293.6   end
 O-16           362   0   1.80329E-02   293.6   end
'Mg-24          362   0   1.05686E-04   293.6   end
'Mg-25          362   0   1.33797E-05   293.6   end
'Mg-26          362   0   1.47310E-05   293.6   end
Al-27           362   0   2.79375E-02   293.6   end
'Si-28          362   0   1.00274E-04   293.6   end
'Si-29          362   0   5.07732E-06   293.6   end
'Si-30          362   0   3.37038E-06   293.6   end
'Ti-46          362   0   4.20262E-07   293.6   end
'Ti-47          362   0   3.79000E-07   293.6   end
'Ti-48          362   0   3.75536E-06   293.6   end
'Ti-49          362   0   2.75590E-07   293.6   end
'Ti-50          362   0   2.63873E-07   293.6   end
'Cr-50          362   0   5.30517E-07   293.6   end
'Cr-52          362   0   1.02189E-05   293.6   end
'Cr-53          362   0   1.15860E-06   293.6   end
'Cr-54          362   0   2.87821E-07   293.6   end
'Mn-55          362   0   6.44602E-06   293.6   end
'Fe-54          362   0   2.34704E-06   293.6   end
'Fe-56          362   0   3.68104E-05   293.6   end
'Fe-57          362   0   8.50550E-07   293.6   end
'Fe-58          362   0   1.12337E-07   293.6   end
'Cu-63          362   0   1.87830E-05   293.6   end
'Cu-65          362   0   8.37182E-06   293.6   end
 U-234          362   0   5.42167E-06   293.6   end
 U-235          362   0   5.19778E-04   293.6   end
 U-236          362   0   2.16868E-06   293.6   end
 U-238          362   0   2.92770E-05   293.6   end
 Pu-239         362  0  5.98421E-07 300 end
Pu-240          362  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1            363   0   3.32434E-02   293.6   end
 O-16           363   0   1.82870E-02   293.6   end
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'Mg-24 363 0 1.05686E-04 293.6 end
'Mg-25 363 0 1.33797E-05 293.6 end
'Mg-26 363 0 1.47310E-05 293.6 end
Al-27 363 0 2.76228E-02 293.6 end
'Si-28 363 0 9.95724E-05 293.6 end
'Si-29 363 0 5.04178E-06 293.6 end
'Si-30 363 0 3.34679E-06 293.6 end
'Ti-46 363 0 4.20262E-07 293.6 end
'Ti-47 363 0 3.79000E-07 293.6 end
'Ti-48 363 0 3.75536E-06 293.6 end
'Ti-49 363 0 2.75590E-07 293.6 end
'Ti-50 363 0 2.63873E-07 293.6 end
'Cr-50 363 0 5.30517E-07 293.6 end
'Cr-52 363 0 1.02189E-05 293.6 end
'Cr-53 363 0 1.15860E-06 293.6 end
'Cr-54 363 0 2.87821E-07 293.6 end
'Mn-55 363 0 6.40711E-06 293.6 end
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'Fe-57 363 0 8.42433E-07 293.6 end
'Fe-58 363 0 1.11265E-07 293.6 end
'Cu-63 363 0 1.86534E-05 293.6 end
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U-235 363 0 6.08578E-04 293.6 end
U-236 363 0 2.54980E-06 293.6 end
U-238 363 0 3.44221E-05 293.6 end
Pu-239 363 0 5.98421E-07 300 end
Pu-240 363 0 3.13646E-08 300 end
' total atom density = 8.01530E-02 a/b-cm
' 8.015300E-02
H-1 364 0 3.32434E-02 293.6 end
O-16 364 0 1.85176E-02 293.6 end
'Mg-24 364 0 1.05686E-04 293.6 end
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'Mg-26 364 0 1.47310E-05 293.6 end
Al-27 364 0 2.73372E-02 293.6 end
'Si-28 364 0 9.89350E-05 293.6 end
'Si-29 364 0 5.00951E-06 293.6 end
'Si-30 364 0 3.32537E-06 293.6 end
'Ti-46 364 0 4.20262E-07 293.6 end
'Ti-47 364 0 3.79000E-07 293.6 end
'Ti-48 364 0 3.75536E-06 293.6 end
'Ti-49 364 0 2.75590E-07 293.6 end
'Ti-50 364 0 2.63873E-07 293.6 end
'Cr-50 364 0 5.30517E-07 293.6 end
'Cr-52 364 0 1.02189E-05 293.6 end
'Cr-53 364 0 1.15860E-06 293.6 end
'Cr-54 364 0 2.87821E-07 293.6 end
'Mn-55 364 0 6.37178E-06 293.6 end
'Fe-54 364 0 2.30432E-06 293.6 end
'Fe-56 364 0 3.61403E-05 293.6 end
'Fe-57 364 0 8.35068E-07 293.6 end
'Fe-58 364 0 1.10292E-07 293.6 end
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'Cu-65 364 0 8.26161E-06 293.6 end
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U-235 364 0 6.89178E-04 293.6 end
U-236 364 0 2.89573E-06 293.6 end
U-238 364 0 3.90920E-05 293.6 end
Pu-239 364 0 5.98421E-07 300 end
Pu-240 364 0 3.13646E-08 300 end
' total atom density = 8.01437E-02 a/b-cm
' 8.014370E-02
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O-16 365 0 1.84469E-02 293.6 end
'Mg-24 365 0 1.05686E-04 293.6 end
'Mg-25 365 0 1.33797E-05 293.6 end
'Mg-26 365 0 1.47310E-05 293.6 end
Al-27 365 0 2.74247E-02 293.6 end
'Si-28 365 0 9.91306E-05 293.6 end
'Si-29 365 0 5.01941E-06 293.6 end
'Si-30 365 0 3.33194E-06 293.6 end
'Ti-46 365 0 4.20262E-07 293.6 end
'Ti-47 365 0 3.79000E-07 293.6 end
'Ti-48 365 0 3.75536E-06 293.6 end
'Ti-49 365 0 2.75590E-07 293.6 end
'Ti-50 365 0 2.63873E-07 293.6 end
'Cr-50 365 0 5.30517E-07 293.6 end
'Cr-52 365 0 1.02189E-05 293.6 end
'Cr-53 365 0 1.15860E-06 293.6 end
'Cr-54 365 0 2.87821E-07 293.6 end
'Mn-55 365 0 6.38261E-06 293.6 end
'Fe-54 365 0 2.31055E-06 293.6 end
'Fe-56 365 0 3.62380E-05 293.6 end
'Fe-57 365 0 8.37326E-07 293.6 end
'Fe-58 365 0 1.10590E-07 293.6 end
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'Cu-65 365 0 8.27767E-06 293.6 end
U-234 365 0 6.97424E-06 293.6 end
U-235 365 0 6.64478E-04 293.6 end
U-236 365 0 2.78972E-06 293.6 end
U-238 365 0 3.76609E-05 293.6 end
Pu-239 365 0 5.98421E-07 300 end
Pu-240 365 0 3.13646E-08 300 end
' total atom density = 8.00985E-02 a/b-cm
' 8.009850E-02
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O-16 366 0 1.81013E-02 293.6 end
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Al-27 366 0 2.78528E-02 293.6 end
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'Ti-46 366 0 4.20262E-07 293.6 end
'Ti-47 366 0 3.79000E-07 293.6 end
'Ti-48 366 0 3.75536E-06 293.6 end
'Ti-49 366 0 2.75590E-07 293.6 end
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'Mn-55 366 0 6.43555E-06 293.6 end
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'Fe-57 366 0 8.48365E-07 293.6 end
'Fe-58 366 0 1.12048E-07 293.6 end
'Cu-63 366 0 1.87481E-05 293.6 end
'Cu-65 366 0 8.35629E-06 293.6 end
U-234 366 0 5.67811E-06 293.6 end
U-235 366 0 5.43678E-04 293.6 end
U-236 366 0 2.27126E-06 293.6 end
U-238 366 0 3.06618E-05 293.6 end
Pu-239 366 0 5.98421E-07 300 end
Pu-240 366 0 3.13646E-08 300 end
' total atom density = 8.00555E-02 a/b-cm
' 8.005550E-02
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O-16 367 0 1.77731E-02 293.6 end
'Mg-24 367 0 1.05686E-04 293.6 end
'Mg-25 367 0 1.33797E-05 293.6 end
'Mg-26 367 0 1.47310E-05 293.6 end
Al-27 367 0 2.82593E-02 293.6 end
'Si-28 367 0 1.00993E-04 293.6 end
'Si-29 367 0 5.11370E-06 293.6 end
'Si-30 367 0 3.39453E-06 293.6 end
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'Ti-48 367 0 3.75536E-06 293.6 end
'Ti-49 367 0 2.75590E-07 293.6 end
'Ti-50 367 0 2.63873E-07 293.6 end
'Cr-50 367 0 5.30517E-07 293.6 end
'Cr-52 367 0 1.02189E-05 293.6 end
'Cr-53 367 0 1.15860E-06 293.6 end
'Cr-54 367 0 2.87821E-07 293.6 end
'Mn-55 367 0 6.48581E-06 293.6 end
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U-234 367 0 4.44742E-06 293.6 end
U-235 367 0 4.28978E-04 293.6 end
U-236 367 0 1.77898E-06 293.6 end
U-238 367 0 2.40161E-05 293.6 end
Pu-239 367 0 5.98421E-07 300 end
Pu-240 367 0 3.13646E-08 300 end
' total atom density = 8.00271E-02 a/b-cm
' 8.002710E-02
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'Mg-24 368 0 1.05686E-04 293.6 end
'Mg-25 368 0 1.33797E-05 293.6 end
'Mg-26 368 0 1.47310E-05 293.6 end
Al-27 368 0 2.85280E-02 293.6 end
'Si-28 368 0 1.01591E-04 293.6 end
'Si-29 368 0 5.14401E-06 293.6 end
'Si-30 368 0 3.41465E-06 293.6 end
'Ti-46 368 0 4.20262E-07 293.6 end
'Ti-47 368 0 3.79000E-07 293.6 end
'Ti-48 368 0 3.75536E-06 293.6 end
'Ti-49 368 0 2.75590E-07 293.6 end
'Ti-50 368 0 2.63873E-07 293.6 end
'Cr-50 368 0 5.30517E-07 293.6 end
'Cr-52 368 0 1.02189E-05 293.6 end
'Cr-53 368 0 1.15860E-06 293.6 end
'Cr-54 368 0 2.87821E-07 293.6 end
'Mn-55 368 0 6.51903E-06 293.6 end

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'Fe-54          368    0   2.38905E-06   293.6   end
'Fe-56          368    0   3.74693E-05   293.6   end
'Fe-57          368    0   8.65776E-07   293.6   end
'Fe-58          368    0   1.14348E-07   293.6   end
'Cu-63          368    0   1.90262E-05   293.6   end
'Cu-65          368    0   8.48022E-06   293.6   end
 U-234          368    0   3.63412E-06   293.6   end
 U-235          368    0   3.53178E-04   293.6   end
 U-236          368    0   1.45366E-06   293.6   end
 U-238          368    0   1.96242E-05   293.6   end
 Pu-239         368  0  5.98421E-07 300 end
Pu-240          368  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
' 8.000130E-02
 H-1            369    0   3.32434E-02   293.6   end
 O-16           369    0   1.73591E-02   293.6   end
'Mg-24          369    0   1.05686E-04   293.6   end
'Mg-25          369    0   1.33797E-05   293.6   end
'Mg-26          369    0   1.47310E-05   293.6   end
Al-27           369    0   2.87722E-02   293.6   end
'Si-28          369    0   1.02136E-04   293.6   end
'Si-29          369    0   5.17160E-06   293.6   end
'Si-30          369    0   3.43297E-06   293.6   end
'Ti-46          369    0   4.20262E-07   293.6   end
'Ti-47          369    0   3.79000E-07   293.6   end
'Ti-48          369    0   3.75536E-06   293.6   end
'Ti-49          369    0   2.75590E-07   293.6   end
'Ti-50          369    0   2.63873E-07   293.6   end
'Cr-50          369    0   5.30517E-07   293.6   end
'Cr-52          369    0   1.02189E-05   293.6   end
'Cr-53          369    0   1.15860E-06   293.6   end
'Cr-54          369    0   2.87821E-07   293.6   end
'Mn-55          369    0   6.54922E-06   293.6   end
'Fe-54          369    0   2.40643E-06   293.6   end
'Fe-56          369    0   3.77418E-05   293.6   end
'Fe-57          369    0   8.72072E-07   293.6   end
'Fe-58          369    0   1.15179E-07   293.6   end
'Cu-63          369    0   1.91268E-05   293.6   end
'Cu-65          369    0   8.52504E-06   293.6   end
 U-234          369    0   2.89485E-06   293.6   end
 U-235          369    0   2.84278E-04   293.6   end
 U-236          369    0   1.15795E-06   293.6   end
 U-238          369    0   1.56322E-05   293.6   end
 Pu-239         369  0  5.98421E-07 300 end
Pu-240          369  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 7
'       total atom density =  8.00583E-02 a/b-cm
' 8.005830E-02
 H-1            371    0   3.32434E-02   293.6   end
 O-16           371    0   1.77945E-02   293.6   end
'Mg-24          371    0   1.05686E-04   293.6   end
'Mg-25          371    0   1.33797E-05   293.6   end
'Mg-26          371    0   1.47310E-05   293.6   end
Al-27           371    0   2.82328E-02   293.6   end
'Si-28          371    0   1.00933E-04   293.6   end
'Si-29          371    0   5.11066E-06   293.6   end
'Si-30          371    0   3.39252E-06   293.6   end
'Ti-46          371    0   4.20262E-07   293.6   end
'Ti-47          371    0   3.79000E-07   293.6   end
'Ti-48          371    0   3.75536E-06   293.6   end
'Ti-49          371    0   2.75590E-07   293.6   end
'Ti-50          371    0   2.63873E-07   293.6   end
'Cr-50          371    0   5.30517E-07   293.6   end
'Cr-52          371    0   1.02189E-05   293.6   end
'Cr-53          371    0   1.15860E-06   293.6   end
'Cr-54          371    0   2.87821E-07   293.6   end
'Mn-55          371    0   6.48252E-06   293.6   end
'Fe-54          371    0   2.36804E-06   293.6   end
'Fe-56          371    0   3.71398E-05   293.6   end
'Fe-57          371    0   8.58163E-07   293.6   end
'Fe-58          371    0   1.13342E-07   293.6   end
'Cu-63          371    0   1.89046E-05   293.6   end
'Cu-65          371    0   8.42602E-06   293.6   end
 U-234          371    0   4.52789E-06   293.6   end
 U-235          371    0   4.36478E-04   293.6   end
 U-236          371    0   1.81117E-06   293.6   end
 U-238          371    0   2.44506E-05   293.6   end
 Pu-239         371  0  5.98421E-07 300 end
Pu-240          371  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
' 8.008950E-02
 H-1            372    0   3.32434E-02   293.6   end
 O-16           372    0   1.80329E-02   293.6   end
'Mg-24          372    0   1.05686E-04   293.6   end
'Mg-25          372    0   1.33797E-05   293.6   end
'Mg-26          372    0   1.47310E-05   293.6   end
Al-27           372    0   2.79375E-02   293.6   end
'Si-28          372    0   1.00274E-04   293.6   end
'Si-29          372    0   5.07732E-06   293.6   end
'Si-30          372    0   3.37038E-06   293.6   end
'Ti-46          372    0   4.20262E-07   293.6   end
'Ti-47          372    0   3.79000E-07   293.6   end
'Ti-48          372    0   3.75536E-06   293.6   end
'Ti-49          372    0   2.75590E-07   293.6   end
'Ti-50          372    0   2.63873E-07   293.6   end
'Cr-50          372    0   5.30517E-07   293.6   end
'Cr-52          372    0   1.02189E-05   293.6   end
'Cr-53          372    0   1.15860E-06   293.6   end
'Cr-54          372    0   2.87821E-07   293.6   end
'Mn-55          372    0   6.44602E-06   293.6   end
'Fe-54          372    0   2.34704E-06   293.6   end
'Fe-56          372    0   3.68104E-05   293.6   end
'Fe-57          372    0   8.50550E-07   293.6   end
'Fe-58          372    0   1.12337E-07   293.6   end
'Cu-63          372    0   1.87830E-05   293.6   end
'Cu-65          372    0   8.37182E-06   293.6   end
 U-234          372    0   5.42167E-06   293.6   end
 U-235          372    0   5.19778E-04   293.6   end
 U-236          372    0   2.16868E-06   293.6   end
 U-238          372    0   2.92770E-05   293.6   end
 Pu-239         372  0  5.98421E-07 300 end
Pu-240          372  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
' 8.012280E-02
 H-1            373    0   3.32434E-02   293.6   end
 O-16           373    0   1.82870E-02   293.6   end
'Mg-24          373    0   1.05686E-04   293.6   end
'Mg-25          373    0   1.33797E-05   293.6   end
'Mg-26          373    0   1.47310E-05   293.6   end
Al-27           373    0   2.76228E-02   293.6   end
'Si-28          373    0   9.95724E-05   293.6   end
'Si-29          373    0   5.04178E-06   293.6   end
'Si-30          373    0   3.34679E-06   293.6   end
'Ti-46          373    0   4.20262E-07   293.6   end
'Ti-47          373    0   3.79000E-07   293.6   end
'Ti-48          373    0   3.75536E-06   293.6   end
'Ti-49          373    0   2.75590E-07   293.6   end
'Ti-50          373    0   2.63873E-07   293.6   end
'Cr-50          373    0   5.30517E-07   293.6   end
'Cr-52          373    0   1.02189E-05   293.6   end
'Cr-53          373    0   1.15860E-06   293.6   end
'Cr-54          373    0   2.87821E-07   293.6   end
'Mn-55          373    0   6.40711E-06   293.6   end
'Fe-54          373    0   2.32464E-06   293.6   end
'Fe-56          373    0   3.64591E-05   293.6   end
'Fe-57          373    0   8.42433E-07   293.6   end
'Fe-58          373    0   1.11265E-07   293.6   end
'Cu-63          373    0   1.86534E-05   293.6   end
'Cu-65          373    0   8.31405E-06   293.6   end
 U-234          373    0   6.37446E-06   293.6   end
 U-235          373    0   6.08578E-04   293.6   end
 U-236          373    0   2.54980E-06   293.6   end
 U-238          373    0   3.44221E-05   293.6   end
 Pu-239         373  0  5.98421E-07 300 end
Pu-240          373  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
' 8.015300E-02
 H-1            374    0   3.32434E-02   293.6   end
 O-16           374    0   1.85176E-02   293.6   end
'Mg-24          374    0   1.05686E-04   293.6   end
'Mg-25          374    0   1.33797E-05   293.6   end
'Mg-26          374    0   1.47310E-05   293.6   end
Al-27           374    0   2.73372E-02   293.6   end
'Si-28          374    0   9.89350E-05   293.6   end
'Si-29          374    0   5.00951E-06   293.6   end
'Si-30          374    0   3.32537E-06   293.6   end
'Ti-46          374    0   4.20262E-07   293.6   end
'Ti-47          374    0   3.79000E-07   293.6   end
'Ti-48          374    0   3.75536E-06   293.6   end
'Ti-49          374    0   2.75590E-07   293.6   end
'Ti-50          374    0   2.63873E-07   293.6   end
'Cr-50          374    0   5.30517E-07   293.6   end
'Cr-52          374    0   1.02189E-05   293.6   end
'Cr-53          374    0   1.15860E-06   293.6   end
'Cr-54          374    0   2.87821E-07   293.6   end
'Mn-55          374    0   6.37178E-06   293.6   end
'Fe-54          374    0   2.30432E-06   293.6   end
'Fe-56          374    0   3.61403E-05   293.6   end
'Fe-57          374    0   8.35068E-07   293.6   end
'Fe-58          374    0   1.10292E-07   293.6   end
'Cu-63          374    0   1.85357E-05   293.6   end
'Cu-65          374    0   8.26161E-06   293.6   end
 U-234          374    0   7.23926E-06   293.6   end
 U-235          374    0   6.89178E-04   293.6   end
 U-236          374    0   2.89573E-06   293.6   end
 U-238          374    0   3.90920E-05   293.6   end
 Pu-239         374  0  5.98421E-07 300 end
Pu-240          374  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
' 8.014370E-02
 H-1            375    0   3.32434E-02   293.6   end
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 O-16          375    0   1.84469E-02   293.6   end
'Mg-24          375    0   1.05686E-04   293.6   end
'Mg-25          375    0   1.33797E-05   293.6   end
'Mg-26          375    0   1.47310E-05   293.6   end
Al-27          375    0   2.74247E-02   293.6   end
'Si-28          375    0   9.91306E-05   293.6   end
'Si-29          375    0   5.01941E-06   293.6   end
'Si-30          375    0   3.33194E-06   293.6   end
'Ti-46          375    0   4.20262E-07   293.6   end
'Ti-47          375    0   3.79000E-07   293.6   end
'Ti-48          375    0   3.75536E-06   293.6   end
'Ti-49          375    0   2.75590E-07   293.6   end
'Ti-50          375    0   2.63873E-07   293.6   end
'Cr-50          375    0   5.30517E-07   293.6   end
'Cr-52          375    0   1.02189E-05   293.6   end
'Cr-53          375    0   1.15860E-06   293.6   end
'Cr-54          375    0   2.87821E-07   293.6   end
'Mn-55          375    0   6.38261E-06   293.6   end
'Fe-54          375    0   2.31055E-06   293.6   end
'Fe-56          375    0   3.62380E-05   293.6   end
'Fe-57          375    0   8.37326E-07   293.6   end
'Fe-58          375    0   1.10590E-07   293.6   end
'Cu-63          375    0   1.85717E-05   293.6   end
'Cu-65          375    0   8.27767E-06   293.6   end
 U-234          375    0   6.97424E-06   293.6   end
 U-235          375    0   6.64478E-04   293.6   end
 U-236          375    0   2.78972E-06   293.6   end
 U-238          375    0   3.76609E-05   293.6   end
 Pu-239         375  0  5.98421E-07 300 end
Pu-240         375  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1           376    0   3.32434E-02   293.6   end
 O-16          376    0   1.81013E-02   293.6   end
'Mg-24          376    0   1.05686E-04   293.6   end
'Mg-25          376    0   1.33797E-05   293.6   end
'Mg-26          376    0   1.47310E-05   293.6   end
Al-27          376    0   2.78528E-02   293.6   end
'Si-28          376    0   1.00085E-04   293.6   end
'Si-29          376    0   5.06774E-06   293.6   end
'Si-30          376    0   3.36403E-06   293.6   end
'Ti-46          376    0   4.20262E-07   293.6   end
'Ti-47          376    0   3.79000E-07   293.6   end
'Ti-48          376    0   3.75536E-06   293.6   end
'Ti-49          376    0   2.75590E-07   293.6   end
'Ti-50          376    0   2.63873E-07   293.6   end
'Cr-50          376    0   5.30517E-07   293.6   end
'Cr-52          376    0   1.02189E-05   293.6   end
'Cr-53          376    0   1.15860E-06   293.6   end
'Cr-54          376    0   2.87821E-07   293.6   end
'Mn-55          376    0   6.43555E-06   293.6   end
'Fe-54          376    0   2.34101E-06   293.6   end
'Fe-56          376    0   3.67158E-05   293.6   end
'Fe-57          376    0   8.48365E-07   293.6   end
'Fe-58          376    0   1.12048E-07   293.6   end
'Cu-63          376    0   1.87481E-05   293.6   end
'Cu-65          376    0   8.35629E-06   293.6   end
 U-234          376    0   5.67811E-06   293.6   end
 U-235          376    0   5.43678E-04   293.6   end
 U-236          376    0   2.27126E-06   293.6   end
 U-238          376    0   3.06618E-05   293.6   end
 Pu-239         376  0  5.98421E-07 300 end
Pu-240         376  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1           377    0   3.32434E-02   293.6   end
 O-16          377    0   1.77731E-02   293.6   end
'Mg-24          377    0   1.05686E-04   293.6   end
'Mg-25          377    0   1.33797E-05   293.6   end
'Mg-26          377    0   1.47310E-05   293.6   end
Al-27          377    0   2.82593E-02   293.6   end
'Si-28          377    0   1.00993E-04   293.6   end
'Si-29          377    0   5.11370E-06   293.6   end
'Si-30          377    0   3.39453E-06   293.6   end
'Ti-46          377    0   4.20262E-07   293.6   end
'Ti-47          377    0   3.79000E-07   293.6   end
'Ti-48          377    0   3.75536E-06   293.6   end
'Ti-49          377    0   2.75590E-07   293.6   end
'Ti-50          377    0   2.63873E-07   293.6   end
'Cr-50          377    0   5.30517E-07   293.6   end
'Cr-52          377    0   1.02189E-05   293.6   end
'Cr-53          377    0   1.15860E-06   293.6   end
'Cr-54          377    0   2.87821E-07   293.6   end
'Mn-55          377    0   6.48581E-06   293.6   end
'Fe-54          377    0   2.36993E-06   293.6   end
'Fe-56          377    0   3.71695E-05   293.6   end
'Fe-57          377    0   8.58848E-07   293.6   end
'Fe-58          377    0   1.13433E-07   293.6   end
'Cu-63          377    0   1.89155E-05   293.6   end
'Cu-65          377    0   8.43090E-06   293.6   end
 U-234          377    0   4.44742E-06   293.6   end
 U-235          377    0   4.28978E-04   293.6   end
 U-236          377    0   1.77898E-06   293.6   end
 U-238          377    0   2.40161E-05   293.6   end
 Pu-239         377  0  5.98421E-07 300 end
Pu-240         377  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1           378    0   3.32434E-02   293.6   end
 O-16          378    0   1.75562E-02   293.6   end
'Mg-24          378    0   1.05686E-04   293.6   end
'Mg-25          378    0   1.33797E-05   293.6   end
'Mg-26          378    0   1.47310E-05   293.6   end
Al-27          378    0   2.85280E-02   293.6   end
'Si-28          378    0   1.01591E-04   293.6   end
'Si-29          378    0   5.14401E-06   293.6   end
'Si-30          378    0   3.41465E-06   293.6   end
'Ti-46          378    0   4.20262E-07   293.6   end
'Ti-47          378    0   3.79000E-07   293.6   end
'Ti-48          378    0   3.75536E-06   293.6   end
'Ti-49          378    0   2.75590E-07   293.6   end
'Ti-50          378    0   2.63873E-07   293.6   end
'Cr-50          378    0   5.30517E-07   293.6   end
'Cr-52          378    0   1.02189E-05   293.6   end
'Cr-53          378    0   1.15860E-06   293.6   end
'Cr-54          378    0   2.87821E-07   293.6   end
'Mn-55          378    0   6.51903E-06   293.6   end
'Fe-54          378    0   2.38905E-06   293.6   end
'Fe-56          378    0   3.74693E-05   293.6   end
'Fe-57          378    0   8.65776E-07   293.6   end
'Fe-58          378    0   1.14348E-07   293.6   end
'Cu-63          378    0   1.90262E-05   293.6   end
'Cu-65          378    0   8.48022E-06   293.6   end
 U-234          378    0   3.63412E-06   293.6   end
 U-235          378    0   3.53178E-04   293.6   end
 U-236          378    0   1.45366E-06   293.6   end
 U-238          378    0   1.96242E-05   293.6   end
 Pu-239         378  0  5.98421E-07 300 end
Pu-240         378  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1           379    0   3.32434E-02   293.6   end
 O-16          379    0   1.73591E-02   293.6   end
'Mg-24          379    0   1.05686E-04   293.6   end
'Mg-25          379    0   1.33797E-05   293.6   end
'Mg-26          379    0   1.47310E-05   293.6   end
Al-27          379    0   2.87722E-02   293.6   end
'Si-28          379    0   1.02136E-04   293.6   end
'Si-29          379    0   5.17160E-06   293.6   end
'Si-30          379    0   3.43297E-06   293.6   end
'Ti-46          379    0   4.20262E-07   293.6   end
'Ti-47          379    0   3.79000E-07   293.6   end
'Ti-48          379    0   3.75536E-06   293.6   end
'Ti-49          379    0   2.75590E-07   293.6   end
'Ti-50          379    0   2.63873E-07   293.6   end
'Cr-50          379    0   5.30517E-07   293.6   end
'Cr-52          379    0   1.02189E-05   293.6   end
'Cr-53          379    0   1.15860E-06   293.6   end
'Cr-54          379    0   2.87821E-07   293.6   end
'Mn-55          379    0   6.54922E-06   293.6   end
'Fe-54          379    0   2.40643E-06   293.6   end
'Fe-56          379    0   3.77418E-05   293.6   end
'Fe-57          379    0   8.72072E-07   293.6   end
'Fe-58          379    0   1.15179E-07   293.6   end
'Cu-63          379    0   1.91268E-05   293.6   end
'Cu-65          379    0   8.52504E-06   293.6   end
 U-234          379    0   2.89485E-06   293.6   end
 U-235          379    0   2.84278E-04   293.6   end
 U-236          379    0   1.15795E-06   293.6   end
 U-238          379    0   1.56322E-05   293.6   end
 Pu-239         379  0  5.98421E-07 300 end
Pu-240         379  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 8
'       total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1           381    0   3.32434E-02   293.6   end
 O-16          381    0   1.77945E-02   293.6   end
'Mg-24          381    0   1.05686E-04   293.6   end
'Mg-25          381    0   1.33797E-05   293.6   end
'Mg-26          381    0   1.47310E-05   293.6   end
Al-27          381    0   2.82328E-02   293.6   end
'Si-28          381    0   1.00933E-04   293.6   end
'Si-29          381    0   5.11066E-06   293.6   end
'Si-30          381    0   3.39252E-06   293.6   end
'Ti-46          381    0   4.20262E-07   293.6   end
'Ti-47          381    0   3.79000E-07   293.6   end
'Ti-48          381    0   3.75536E-06   293.6   end
'Ti-49          381    0   2.75590E-07   293.6   end
'Ti-50          381    0   2.63873E-07   293.6   end
'Cr-50          381    0   5.30517E-07   293.6   end
'Cr-52          381    0   1.02189E-05   293.6   end
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'Cr-53          381    0   1.15860E-06   293.6   end
'Cr-54          381    0   2.87821E-07   293.6   end
'Mn-55          381    0   6.48252E-06   293.6   end
'Fe-54          381    0   2.36804E-06   293.6   end
'Fe-56          381    0   3.71398E-05   293.6   end
'Fe-57          381    0   8.58163E-07   293.6   end
'Fe-58          381    0   1.13342E-07   293.6   end
'Cu-63          381    0   1.89046E-05   293.6   end
'Cu-65          381    0   8.42602E-06   293.6   end
 U-234          381    0   4.52789E-06   293.6   end
 U-235          381    0   4.36478E-04   293.6   end
 U-236          381    0   1.81117E-06   293.6   end
 U-238          381    0   2.44506E-05   293.6   end
 Pu-239         381  0  5.98421E-07 300 end
Pu-240          381  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
' 8.008950E-02
 H-1            382    0   3.32434E-02   293.6   end
 O-16           382    0   1.80329E-02   293.6   end
'Mg-24          382    0   1.05686E-04   293.6   end
'Mg-25          382    0   1.33797E-05   293.6   end
'Mg-26          382    0   1.47310E-05   293.6   end
Al-27           382    0   2.79375E-02   293.6   end
'Si-28          382    0   1.00274E-04   293.6   end
'Si-29          382    0   5.07732E-06   293.6   end
'Si-30          382    0   3.37038E-06   293.6   end
'Ti-46          382    0   4.20262E-07   293.6   end
'Ti-47          382    0   3.79000E-07   293.6   end
'Ti-48          382    0   3.75536E-06   293.6   end
'Ti-49          382    0   2.75590E-07   293.6   end
'Ti-50          382    0   2.63873E-07   293.6   end
'Cr-50          382    0   5.30517E-07   293.6   end
'Cr-52          382    0   1.02189E-05   293.6   end
'Cr-53          382    0   1.15860E-06   293.6   end
'Cr-54          382    0   2.87821E-07   293.6   end
'Mn-55          382    0   6.44602E-06   293.6   end
'Fe-54          382    0   2.34704E-06   293.6   end
'Fe-56          382    0   3.68104E-05   293.6   end
'Fe-57          382    0   8.50550E-07   293.6   end
'Fe-58          382    0   1.12337E-07   293.6   end
'Cu-63          382    0   1.87830E-05   293.6   end
'Cu-65          382    0   8.37182E-06   293.6   end
 U-234          382    0   5.42167E-06   293.6   end
 U-235          382    0   5.19778E-04   293.6   end
 U-236          382    0   2.16868E-06   293.6   end
 U-238          382    0   2.92770E-05   293.6   end
 Pu-239         382  0  5.98421E-07 300 end
Pu-240          382  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
' 8.012280E-02
 H-1            383    0   3.32434E-02   293.6   end
 O-16           383    0   1.82870E-02   293.6   end
'Mg-24          383    0   1.05686E-04   293.6   end
'Mg-25          383    0   1.33797E-05   293.6   end
'Mg-26          383    0   1.47310E-05   293.6   end
Al-27           383    0   2.76228E-02   293.6   end
'Si-28          383    0   9.95724E-05   293.6   end
'Si-29          383    0   5.04178E-06   293.6   end
'Si-30          383    0   3.34679E-06   293.6   end
'Ti-46          383    0   4.20262E-07   293.6   end
'Ti-47          383    0   3.79000E-07   293.6   end
'Ti-48          383    0   3.75536E-06   293.6   end
'Ti-49          383    0   2.75590E-07   293.6   end
'Ti-50          383    0   2.63873E-07   293.6   end
'Cr-50          383    0   5.30517E-07   293.6   end
'Cr-52          383    0   1.02189E-05   293.6   end
'Cr-53          383    0   1.15860E-06   293.6   end
'Cr-54          383    0   2.87821E-07   293.6   end
'Mn-55          383    0   6.40711E-06   293.6   end
'Fe-54          383    0   2.32464E-06   293.6   end
'Fe-56          383    0   3.64591E-05   293.6   end
'Fe-57          383    0   8.42433E-07   293.6   end
'Fe-58          383    0   1.11265E-07   293.6   end
'Cu-63          383    0   1.86534E-05   293.6   end
'Cu-65          383    0   8.31405E-06   293.6   end
 U-234          383    0   6.37446E-06   293.6   end
 U-235          383    0   6.08578E-04   293.6   end
 U-236          383    0   2.54980E-06   293.6   end
 U-238          383    0   3.44221E-05   293.6   end
 Pu-239         383  0  5.98421E-07 300 end
Pu-240          383  0  3.13646E-08 300 end
'       total atom density =  8.01530E-02 a/b-cm
' 8.015300E-02
 H-1            384    0   3.32434E-02   293.6   end
 O-16           384    0   1.85176E-02   293.6   end
'Mg-24          384    0   1.05686E-04   293.6   end
'Mg-25          384    0   1.33797E-05   293.6   end
'Mg-26          384    0   1.47310E-05   293.6   end
Al-27           384    0   2.73372E-02   293.6   end
'Si-28          384    0   9.89350E-05   293.6   end
'Si-29          384    0   5.00951E-06   293.6   end
'Si-30          384    0   3.32537E-06   293.6   end
'Ti-46          384    0   4.20262E-07   293.6   end
'Ti-47          384    0   3.79000E-07   293.6   end
'Ti-48          384    0   3.75536E-06   293.6   end
'Ti-49          384    0   2.75590E-07   293.6   end
'Ti-50          384    0   2.63873E-07   293.6   end
'Cr-50          384    0   5.30517E-07   293.6   end
'Cr-52          384    0   1.02189E-05   293.6   end
'Cr-53          384    0   1.15860E-06   293.6   end
'Cr-54          384    0   2.87821E-07   293.6   end
'Mn-55          384    0   6.37178E-06   293.6   end
'Fe-54          384    0   2.30432E-06   293.6   end
'Fe-56          384    0   3.61403E-05   293.6   end
'Fe-57          384    0   8.35068E-07   293.6   end
'Fe-58          384    0   1.10292E-07   293.6   end
'Cu-63          384    0   1.85357E-05   293.6   end
'Cu-65          384    0   8.26161E-06   293.6   end
 U-234          384    0   7.23926E-06   293.6   end
 U-235          384    0   6.89178E-04   293.6   end
 U-236          384    0   2.89573E-06   293.6   end
 U-238          384    0   3.90920E-05   293.6   end
 Pu-239         384  0  5.98421E-07 300 end
Pu-240          384  0  3.13646E-08 300 end
'       total atom density =  8.01437E-02 a/b-cm
' 8.014370E-02
 H-1            385    0   3.32434E-02   293.6   end
 O-16           385    0   1.84469E-02   293.6   end
'Mg-24          385    0   1.05686E-04   293.6   end
'Mg-25          385    0   1.33797E-05   293.6   end
'Mg-26          385    0   1.47310E-05   293.6   end
Al-27           385    0   2.74247E-02   293.6   end
'Si-28          385    0   9.91306E-05   293.6   end
'Si-29          385    0   5.01941E-06   293.6   end
'Si-30          385    0   3.33194E-06   293.6   end
'Ti-46          385    0   4.20262E-07   293.6   end
'Ti-47          385    0   3.79000E-07   293.6   end
'Ti-48          385    0   3.75536E-06   293.6   end
'Ti-49          385    0   2.75590E-07   293.6   end
'Ti-50          385    0   2.63873E-07   293.6   end
'Cr-50          385    0   5.30517E-07   293.6   end
'Cr-52          385    0   1.02189E-05   293.6   end
'Cr-53          385    0   1.15860E-06   293.6   end
'Cr-54          385    0   2.87821E-07   293.6   end
'Mn-55          385    0   6.38261E-06   293.6   end
'Fe-54          385    0   2.31055E-06   293.6   end
'Fe-56          385    0   3.62380E-05   293.6   end
'Fe-57          385    0   8.37326E-07   293.6   end
'Fe-58          385    0   1.10590E-07   293.6   end
'Cu-63          385    0   1.85717E-05   293.6   end
'Cu-65          385    0   8.27767E-06   293.6   end
 U-234          385    0   6.97424E-06   293.6   end
 U-235          385    0   6.64478E-04   293.6   end
 U-236          385    0   2.78972E-06   293.6   end
 U-238          385    0   3.76609E-05   293.6   end
 Pu-239         385  0  5.98421E-07 300 end
Pu-240          385  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
' 8.009850E-02
 H-1            386    0   3.32434E-02   293.6   end
 O-16           386    0   1.81013E-02   293.6   end
'Mg-24          386    0   1.05686E-04   293.6   end
'Mg-25          386    0   1.33797E-05   293.6   end
'Mg-26          386    0   1.47310E-05   293.6   end
Al-27           386    0   2.78528E-02   293.6   end
'Si-28          386    0   1.00085E-04   293.6   end
'Si-29          386    0   5.06774E-06   293.6   end
'Si-30          386    0   3.36403E-06   293.6   end
'Ti-46          386    0   4.20262E-07   293.6   end
'Ti-47          386    0   3.79000E-07   293.6   end
'Ti-48          386    0   3.75536E-06   293.6   end
'Ti-49          386    0   2.75590E-07   293.6   end
'Ti-50          386    0   2.63873E-07   293.6   end
'Cr-50          386    0   5.30517E-07   293.6   end
'Cr-52          386    0   1.02189E-05   293.6   end
'Cr-53          386    0   1.15860E-06   293.6   end
'Cr-54          386    0   2.87821E-07   293.6   end
'Mn-55          386    0   6.43555E-06   293.6   end
'Fe-54          386    0   2.34101E-06   293.6   end
'Fe-56          386    0   3.67158E-05   293.6   end
'Fe-57          386    0   8.48365E-07   293.6   end
'Fe-58          386    0   1.12048E-07   293.6   end
'Cu-63          386    0   1.87481E-05   293.6   end
'Cu-65          386    0   8.35629E-06   293.6   end
 U-234          386    0   5.67811E-06   293.6   end
 U-235          386    0   5.43678E-04   293.6   end
 U-236          386    0   2.27126E-06   293.6   end
 U-238          386    0   3.06618E-05   293.6   end
 Pu-239         386  0  5.98421E-07 300 end
Pu-240          386  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
' 8.005550E-02
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 H-1          387    0   3.32434E-02   293.6   end
 O-16         387    0   1.77731E-02   293.6   end
'Mg-24        387    0   1.05686E-04   293.6   end
'Mg-25        387    0   1.33797E-05   293.6   end
'Mg-26        387    0   1.47310E-05   293.6   end
 Al-27        387    0   2.82593E-02   293.6   end
'Si-28        387    0   1.00993E-04   293.6   end
'Si-29        387    0   5.11370E-06   293.6   end
'Si-30        387    0   3.39453E-06   293.6   end
'Ti-46        387    0   4.20262E-07   293.6   end
'Ti-47        387    0   3.79000E-07   293.6   end
'Ti-48        387    0   3.75536E-06   293.6   end
'Ti-49        387    0   2.75590E-07   293.6   end
'Ti-50        387    0   2.63873E-07   293.6   end
'Cr-50        387    0   5.30517E-07   293.6   end
'Cr-52        387    0   1.02189E-05   293.6   end
'Cr-53        387    0   1.15860E-06   293.6   end
'Cr-54        387    0   2.87821E-07   293.6   end
'Mn-55        387    0   6.48581E-06   293.6   end
'Fe-54        387    0   2.36993E-06   293.6   end
'Fe-56        387    0   3.71695E-05   293.6   end
'Fe-57        387    0   8.58848E-07   293.6   end
'Fe-58        387    0   1.13433E-07   293.6   end
'Cu-63        387    0   1.89155E-05   293.6   end
'Cu-65        387    0   8.43090E-06   293.6   end
 U-234        387    0   4.44742E-06   293.6   end
 U-235        387    0   4.28978E-04   293.6   end
 U-236        387    0   1.77898E-06   293.6   end
 U-238        387    0   2.40161E-05   293.6   end
 Pu-239       387  0  5.98421E-07 300 end
Pu-240        387  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
' 8.002710E-02
 H-1          388    0   3.32434E-02   293.6   end
 O-16         388    0   1.75562E-02   293.6   end
'Mg-24        388    0   1.05686E-04   293.6   end
'Mg-25        388    0   1.33797E-05   293.6   end
'Mg-26        388    0   1.47310E-05   293.6   end
 Al-27        388    0   2.85280E-02   293.6   end
'Si-28        388    0   1.01591E-04   293.6   end
'Si-29        388    0   5.14401E-06   293.6   end
'Si-30        388    0   3.41465E-06   293.6   end
'Ti-46        388    0   4.20262E-07   293.6   end
'Ti-47        388    0   3.79000E-07   293.6   end
'Ti-48        388    0   3.75536E-06   293.6   end
'Ti-49        388    0   2.75590E-07   293.6   end
'Ti-50        388    0   2.63873E-07   293.6   end
'Cr-50        388    0   5.30517E-07   293.6   end
'Cr-52        388    0   1.02189E-05   293.6   end
'Cr-53        388    0   1.15860E-06   293.6   end
'Cr-54        388    0   2.87821E-07   293.6   end
'Mn-55        388    0   6.51903E-06   293.6   end
'Fe-54        388    0   2.38905E-06   293.6   end
'Fe-56        388    0   3.74693E-05   293.6   end
'Fe-57        388    0   8.65776E-07   293.6   end
'Fe-58        388    0   1.14348E-07   293.6   end
'Cu-63        388    0   1.90262E-05   293.6   end
'Cu-65        388    0   8.48022E-06   293.6   end
 U-234        388    0   3.63412E-06   293.6   end
 U-235        388    0   3.53178E-04   293.6   end
 U-236        388    0   1.45366E-06   293.6   end
 U-238        388    0   1.96242E-05   293.6   end
 Pu-239       388  0  5.98421E-07 300 end
Pu-240        388  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
' 8.000130E-02
 H-1          389    0   3.32434E-02   293.6   end
 O-16         389    0   1.73591E-02   293.6   end
'Mg-24        389    0   1.05686E-04   293.6   end
'Mg-25        389    0   1.33797E-05   293.6   end
'Mg-26        389    0   1.47310E-05   293.6   end
 Al-27        389    0   2.87722E-02   293.6   end
'Si-28        389    0   1.02136E-04   293.6   end
'Si-29        389    0   5.17160E-06   293.6   end
'Si-30        389    0   3.43297E-06   293.6   end
'Ti-46        389    0   4.20262E-07   293.6   end
'Ti-47        389    0   3.79000E-07   293.6   end
'Ti-48        389    0   3.75536E-06   293.6   end
'Ti-49        389    0   2.75590E-07   293.6   end
'Ti-50        389    0   2.63873E-07   293.6   end
'Cr-50        389    0   5.30517E-07   293.6   end
'Cr-52        389    0   1.02189E-05   293.6   end
'Cr-53        389    0   1.15860E-06   293.6   end
'Cr-54        389    0   2.87821E-07   293.6   end
'Mn-55        389    0   6.54922E-06   293.6   end
'Fe-54        389    0   2.40643E-06   293.6   end
'Fe-56        389    0   3.77418E-05   293.6   end
'Fe-57        389    0   8.72072E-07   293.6   end
'Fe-58        389    0   1.15179E-07   293.6   end
'Cu-63        389    0   1.91268E-05   293.6   end
'Cu-65        389    0   8.52504E-06   293.6   end
 U-234        389    0   2.89485E-06   293.6   end
 U-235        389    0   2.84278E-04   293.6   end
 U-236        389    0   1.15795E-06   293.6   end
 U-238        389    0   1.56322E-05   293.6   end
 Pu-239       389  0  5.98421E-07 300 end
Pu-240        389  0  3.13646E-08 300 end
'
'       Outer Fuel Element  fueled region 9
'       total atom density =  8.00583E-02 a/b-cm
' 8.005830E-02
 H-1          391    0   3.32434E-02   293.6   end
 O-16         391    0   1.77945E-02   293.6   end
'Mg-24        391    0   1.05686E-04   293.6   end
'Mg-25        391    0   1.33797E-05   293.6   end
'Mg-26        391    0   1.47310E-05   293.6   end
 Al-27        391    0   2.82328E-02   293.6   end
'Si-28        391    0   1.00933E-04   293.6   end
'Si-29        391    0   5.11066E-06   293.6   end
'Si-30        391    0   3.39252E-06   293.6   end
'Ti-46        391    0   4.20262E-07   293.6   end
'Ti-47        391    0   3.79000E-07   293.6   end
'Ti-48        391    0   3.75536E-06   293.6   end
'Ti-49        391    0   2.75590E-07   293.6   end
'Ti-50        391    0   2.63873E-07   293.6   end
'Cr-50        391    0   5.30517E-07   293.6   end
'Cr-52        391    0   1.02189E-05   293.6   end
'Cr-53        391    0   1.15860E-06   293.6   end
'Cr-54        391    0   2.87821E-07   293.6   end
'Mn-55        391    0   6.48252E-06   293.6   end
'Fe-54        391    0   2.36804E-06   293.6   end
'Fe-56        391    0   3.71398E-05   293.6   end
'Fe-57        391    0   8.58163E-07   293.6   end
'Fe-58        391    0   1.13342E-07   293.6   end
'Cu-63        391    0   1.89046E-05   293.6   end
'Cu-65        391    0   8.42602E-06   293.6   end
 U-234        391    0   4.52789E-06   293.6   end
 U-235        391    0   4.36478E-04   293.6   end
 U-236        391    0   1.81117E-06   293.6   end
 U-238        391    0   2.44506E-05   293.6   end
 Pu-239       391  0  5.98421E-07 300 end
Pu-240        391  0  3.13646E-08 300 end
'       total atom density =  8.00895E-02 a/b-cm
' 8.008950E-02
 H-1          392    0   3.32434E-02   293.6   end
 O-16         392    0   1.80329E-02   293.6   end
'Mg-24        392    0   1.05686E-04   293.6   end
'Mg-25        392    0   1.33797E-05   293.6   end
'Mg-26        392    0   1.47310E-05   293.6   end
 Al-27        392    0   2.79375E-02   293.6   end
'Si-28        392    0   1.00274E-04   293.6   end
'Si-29        392    0   5.07732E-06   293.6   end
'Si-30        392    0   3.37038E-06   293.6   end
'Ti-46        392    0   4.20262E-07   293.6   end
'Ti-47        392    0   3.79000E-07   293.6   end
'Ti-48        392    0   3.75536E-06   293.6   end
'Ti-49        392    0   2.75590E-07   293.6   end
'Ti-50        392    0   2.63873E-07   293.6   end
'Cr-50        392    0   5.30517E-07   293.6   end
'Cr-52        392    0   1.02189E-05   293.6   end
'Cr-53        392    0   1.15860E-06   293.6   end
'Cr-54        392    0   2.87821E-07   293.6   end
'Mn-55        392    0   6.44602E-06   293.6   end
'Fe-54        392    0   2.34704E-06   293.6   end
'Fe-56        392    0   3.68104E-05   293.6   end
'Fe-57        392    0   8.50550E-07   293.6   end
'Fe-58        392    0   1.12337E-07   293.6   end
'Cu-63        392    0   1.87830E-05   293.6   end
'Cu-65        392    0   8.37182E-06   293.6   end
 U-234        392    0   5.42167E-06   293.6   end
 U-235        392    0   5.19778E-04   293.6   end
 U-236        392    0   2.16868E-06   293.6   end
 U-238        392    0   2.92770E-05   293.6   end
 Pu-239       392  0  5.98421E-07 300 end
Pu-240        392  0  3.13646E-08 300 end
'       total atom density =  8.01228E-02 a/b-cm
' 8.012280E-02
 H-1          393    0   3.32434E-02   293.6   end
 O-16         393    0   1.82870E-02   293.6   end
'Mg-24        393    0   1.05686E-04   293.6   end
'Mg-25        393    0   1.33797E-05   293.6   end
'Mg-26        393    0   1.47310E-05   293.6   end
 Al-27        393    0   2.76228E-02   293.6   end
'Si-28        393    0   9.95724E-05   293.6   end
'Si-29        393    0   5.04178E-06   293.6   end
'Si-30        393    0   3.34679E-06   293.6   end
'Ti-46        393    0   4.20262E-07   293.6   end
'Ti-47        393    0   3.79000E-07   293.6   end
'Ti-48        393    0   3.75536E-06   293.6   end
'Ti-49        393    0   2.75590E-07   293.6   end
'Ti-50        393    0   2.63873E-07   293.6   end
'Cr-50        393    0   5.30517E-07   293.6   end
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'Cr-52        393   0  1.02189E-05  293.6  end
'Cr-53        393   0  1.15860E-06  293.6  end
'Cr-54        393   0  2.87821E-07  293.6  end
'Mn-55        393   0  6.40711E-06  293.6  end
'Fe-54        393   0  2.32464E-06  293.6  end
'Fe-56        393   0  3.64591E-05  293.6  end
'Fe-57        393   0  8.42433E-07  293.6  end
'Fe-58        393   0  1.11265E-07  293.6  end
'Cu-63        393   0  1.86534E-05  293.6  end
'Cu-65        393   0  8.31405E-06  293.6  end
 U-234        393   0  6.37446E-06  293.6  end
 U-235        393   0  6.08578E-04  293.6  end
 U-236        393   0  2.54980E-06  293.6  end
 U-238        393   0  3.44221E-05  293.6  end
 Pu-239       393  0  5.98421E-07 300 end
Pu-240        393  0  3.13646E-08 300 end
'      total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1          394   0  3.32434E-02  293.6  end
 O-16         394   0  1.85176E-02  293.6  end
'Mg-24        394   0  1.05686E-04  293.6  end
'Mg-25        394   0  1.33797E-05  293.6  end
'Mg-26        394   0  1.47310E-05  293.6  end
Al-27         394   0  2.73372E-02  293.6  end
'Si-28        394   0  9.89350E-05  293.6  end
'Si-29        394   0  5.00951E-06  293.6  end
'Si-30        394   0  3.32537E-06  293.6  end
'Ti-46        394   0  4.20262E-07  293.6  end
'Ti-47        394   0  3.79000E-07  293.6  end
'Ti-48        394   0  3.75536E-06  293.6  end
'Ti-49        394   0  2.75590E-07  293.6  end
'Ti-50        394   0  2.63873E-07  293.6  end
'Cr-50        394   0  5.30517E-07  293.6  end
'Cr-52        394   0  1.02189E-05  293.6  end
'Cr-53        394   0  1.15860E-06  293.6  end
'Cr-54        394   0  2.87821E-07  293.6  end
'Mn-55        394   0  6.37178E-06  293.6  end
'Fe-54        394   0  2.30432E-06  293.6  end
'Fe-56        394   0  3.61403E-05  293.6  end
'Fe-57        394   0  8.35068E-07  293.6  end
'Fe-58        394   0  1.10292E-07  293.6  end
'Cu-63        394   0  1.85357E-05  293.6  end
'Cu-65        394   0  8.26161E-06  293.6  end
 U-234        394   0  7.23926E-06  293.6  end
 U-235        394   0  6.89178E-04  293.6  end
 U-236        394   0  2.89573E-06  293.6  end
 U-238        394   0  3.90920E-05  293.6  end
 Pu-239       394  0  5.98421E-07 300 end
Pu-240        394  0  3.13646E-08 300 end
'      total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1          395   0  3.32434E-02  293.6  end
 O-16         395   0  1.84469E-02  293.6  end
'Mg-24        395   0  1.05686E-04  293.6  end
'Mg-25        395   0  1.33797E-05  293.6  end
'Mg-26        395   0  1.47310E-05  293.6  end
Al-27         395   0  2.74247E-02  293.6  end
'Si-28        395   0  9.91306E-05  293.6  end
'Si-29        395   0  5.01941E-06  293.6  end
'Si-30        395   0  3.33194E-06  293.6  end
'Ti-46        395   0  4.20262E-07  293.6  end
'Ti-47        395   0  3.79000E-07  293.6  end
'Ti-48        395   0  3.75536E-06  293.6  end
'Ti-49        395   0  2.75590E-07  293.6  end
'Ti-50        395   0  2.63873E-07  293.6  end
'Cr-50        395   0  5.30517E-07  293.6  end
'Cr-52        395   0  1.02189E-05  293.6  end
'Cr-53        395   0  1.15860E-06  293.6  end
'Cr-54        395   0  2.87821E-07  293.6  end
'Mn-55        395   0  6.38261E-06  293.6  end
'Fe-54        395   0  2.31055E-06  293.6  end
'Fe-56        395   0  3.62380E-05  293.6  end
'Fe-57        395   0  8.37326E-07  293.6  end
'Fe-58        395   0  1.10590E-07  293.6  end
'Cu-63        395   0  1.85717E-05  293.6  end
'Cu-65        395   0  8.27767E-06  293.6  end
 U-234        395   0  6.97424E-06  293.6  end
 U-235        395   0  6.64478E-04  293.6  end
 U-236        395   0  2.78972E-06  293.6  end
 U-238        395   0  3.76609E-05  293.6  end
 Pu-239       395  0  5.98421E-07 300 end
Pu-240        395  0  3.13646E-08 300 end
'      total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1          396   0  3.32434E-02  293.6  end
 O-16         396   0  1.81013E-02  293.6  end
'Mg-24        396   0  1.05686E-04  293.6  end
'Mg-25        396   0  1.33797E-05  293.6  end
'Mg-26        396   0  1.47310E-05  293.6  end
Al-27         396   0  2.78528E-02  293.6  end
'Si-28        396   0  1.00085E-04  293.6  end
'Si-29        396   0  5.06774E-06  293.6  end
'Si-30        396   0  3.36403E-06  293.6  end
'Ti-46        396   0  4.20262E-07  293.6  end
'Ti-47        396   0  3.79000E-07  293.6  end
'Ti-48        396   0  3.75536E-06  293.6  end
'Ti-49        396   0  2.75590E-07  293.6  end
'Ti-50        396   0  2.63873E-07  293.6  end
'Cr-50        396   0  5.30517E-07  293.6  end
'Cr-52        396   0  1.02189E-05  293.6  end
'Cr-53        396   0  1.15860E-06  293.6  end
'Cr-54        396   0  2.87821E-07  293.6  end
'Mn-55        396   0  6.43555E-06  293.6  end
'Fe-54        396   0  2.34101E-06  293.6  end
'Fe-56        396   0  3.67158E-05  293.6  end
'Fe-57        396   0  8.48365E-07  293.6  end
'Fe-58        396   0  1.12048E-07  293.6  end
'Cu-63        396   0  1.87481E-05  293.6  end
'Cu-65        396   0  8.35629E-06  293.6  end
 U-234        396   0  5.67811E-06  293.6  end
 U-235        396   0  5.43678E-04  293.6  end
 U-236        396   0  2.27126E-06  293.6  end
 U-238        396   0  3.06618E-05  293.6  end
 Pu-239       396  0  5.98421E-07 300 end
Pu-240        396  0  3.13646E-08 300 end
'      total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1          397   0  3.32434E-02  293.6  end
 O-16         397   0  1.77731E-02  293.6  end
'Mg-24        397   0  1.05686E-04  293.6  end
'Mg-25        397   0  1.33797E-05  293.6  end
'Mg-26        397   0  1.47310E-05  293.6  end
Al-27         397   0  2.82593E-02  293.6  end
'Si-28        397   0  1.00993E-04  293.6  end
'Si-29        397   0  5.11370E-06  293.6  end
'Si-30        397   0  3.39453E-06  293.6  end
'Ti-46        397   0  4.20262E-07  293.6  end
'Ti-47        397   0  3.79000E-07  293.6  end
'Ti-48        397   0  3.75536E-06  293.6  end
'Ti-49        397   0  2.75590E-07  293.6  end
'Ti-50        397   0  2.63873E-07  293.6  end
'Cr-50        397   0  5.30517E-07  293.6  end
'Cr-52        397   0  1.02189E-05  293.6  end
'Cr-53        397   0  1.15860E-06  293.6  end
'Cr-54        397   0  2.87821E-07  293.6  end
'Mn-55        397   0  6.48581E-06  293.6  end
'Fe-54        397   0  2.36993E-06  293.6  end
'Fe-56        397   0  3.71695E-05  293.6  end
'Fe-57        397   0  8.58848E-07  293.6  end
'Fe-58        397   0  1.13433E-07  293.6  end
'Cu-63        397   0  1.89155E-05  293.6  end
'Cu-65        397   0  8.43090E-06  293.6  end
 U-234        397   0  4.44742E-06  293.6  end
 U-235        397   0  4.28978E-04  293.6  end
 U-236        397   0  1.77898E-06  293.6  end
 U-238        397   0  2.40161E-05  293.6  end
 Pu-239       397  0  5.98421E-07 300 end
Pu-240        397  0  3.13646E-08 300 end
'      total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1          398   0  3.32434E-02  293.6  end
 O-16         398   0  1.75562E-02  293.6  end
'Mg-24        398   0  1.05686E-04  293.6  end
'Mg-25        398   0  1.33797E-05  293.6  end
'Mg-26        398   0  1.47310E-05  293.6  end
Al-27         398   0  2.85280E-02  293.6  end
'Si-28        398   0  1.01591E-04  293.6  end
'Si-29        398   0  5.14401E-06  293.6  end
'Si-30        398   0  3.41465E-06  293.6  end
'Ti-46        398   0  4.20262E-07  293.6  end
'Ti-47        398   0  3.79000E-07  293.6  end
'Ti-48        398   0  3.75536E-06  293.6  end
'Ti-49        398   0  2.75590E-07  293.6  end
'Ti-50        398   0  2.63873E-07  293.6  end
'Cr-50        398   0  5.30517E-07  293.6  end
'Cr-52        398   0  1.02189E-05  293.6  end
'Cr-53        398   0  1.15860E-06  293.6  end
'Cr-54        398   0  2.87821E-07  293.6  end
'Mn-55        398   0  6.51903E-06  293.6  end
'Fe-54        398   0  2.38905E-06  293.6  end
'Fe-56        398   0  3.74693E-05  293.6  end
'Fe-57        398   0  8.65776E-07  293.6  end
'Fe-58        398   0  1.14348E-07  293.6  end
'Cu-63        398   0  1.90262E-05  293.6  end
'Cu-65        398   0  8.48022E-06  293.6  end
 U-234        398   0  3.63412E-06  293.6  end
 U-235        398   0  3.53178E-04  293.6  end
 U-236        398   0  1.45366E-06  293.6  end
 U-238        398   0  1.96242E-05  293.6  end
 Pu-239       398  0  5.98421E-07 300 end
Pu-240        398  0  3.13646E-08 300 end
'      total atom density =  8.00013E-02 a/b-cm
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'  8.000130E-02
 H-1          399   0  3.32434E-02  293.6  end
 O-16         399   0  1.73591E-02  293.6  end
'Mg-24        399   0  1.05686E-04  293.6  end
'Mg-25        399   0  1.33797E-05  293.6  end
'Mg-26        399   0  1.47310E-05  293.6  end
Al-27         399   0  2.87722E-02  293.6  end
'Si-28        399   0  1.02136E-04  293.6  end
'Si-29        399   0  5.17160E-06  293.6  end
'Si-30        399   0  3.43297E-06  293.6  end
'Ti-46        399   0  4.20262E-07  293.6  end
'Ti-47        399   0  3.79000E-07  293.6  end
'Ti-48        399   0  3.75536E-06  293.6  end
'Ti-49        399   0  2.75590E-07  293.6  end
'Ti-50        399   0  2.63873E-07  293.6  end
'Cr-50        399   0  5.30517E-07  293.6  end
'Cr-52        399   0  1.02189E-05  293.6  end
'Cr-53        399   0  1.15860E-06  293.6  end
'Cr-54        399   0  2.87821E-07  293.6  end
'Mn-55        399   0  6.54922E-06  293.6  end
'Fe-54        399   0  2.40643E-06  293.6  end
'Fe-56        399   0  3.77418E-05  293.6  end
'Fe-57        399   0  8.72072E-07  293.6  end
'Fe-58        399   0  1.15179E-07  293.6  end
'Cu-63        399   0  1.91268E-05  293.6  end
'Cu-65        399   0  8.52504E-06  293.6  end
 U-234        399   0  2.89485E-06  293.6  end
 U-235        399   0  2.84278E-04  293.6  end
 U-236        399   0  1.15795E-06  293.6  end
 U-238        399   0  1.56322E-05  293.6  end
 Pu-239       399  0  5.98421E-07 300 end
Pu-240        399  0  3.13646E-08 300 end
'
'      Outer Fuel Element  fueled region 0 Central
'      total atom density =  8.00583E-02 a/b-cm
'  8.005830E-02
 H-1          301   0  3.32434E-02  293.6  end
 O-16         301   0  1.77945E-02  293.6  end
'Mg-24        301   0  1.05686E-04  293.6  end
'Mg-25        301   0  1.33797E-05  293.6  end
'Mg-26        301   0  1.47310E-05  293.6  end
Al-27         301   0  2.82328E-02  293.6  end
'Si-28        301   0  1.00933E-04  293.6  end
'Si-29        301   0  5.11066E-06  293.6  end
'Si-30        301   0  3.39252E-06  293.6  end
'Ti-46        301   0  4.20262E-07  293.6  end
'Ti-47        301   0  3.79000E-07  293.6  end
'Ti-48        301   0  3.75536E-06  293.6  end
'Ti-49        301   0  2.75590E-07  293.6  end
'Ti-50        301   0  2.63873E-07  293.6  end
'Cr-50        301   0  5.30517E-07  293.6  end
'Cr-52        301   0  1.02189E-05  293.6  end
'Cr-53        301   0  1.15860E-06  293.6  end
'Cr-54        301   0  2.87821E-07  293.6  end
'Mn-55        301   0  6.48252E-06  293.6  end
'Fe-54        301   0  2.36804E-06  293.6  end
'Fe-56        301   0  3.71398E-05  293.6  end
'Fe-57        301   0  8.58163E-07  293.6  end
'Fe-58        301   0  1.13342E-07  293.6  end
'Cu-63        301   0  1.89046E-05  293.6  end
'Cu-65        301   0  8.42602E-06  293.6  end
 U-234        301   0  4.52789E-06  293.6  end
 U-235        301   0  4.36478E-04  293.6  end
 U-236        301   0  1.81117E-06  293.6  end
 U-238        301   0  2.44506E-05  293.6  end
 Pu-239       301  0  5.98421E-07 300 end
Pu-240        301  0  3.13646E-08 300 end
'      total atom density =  8.00895E-02 a/b-cm
'  8.008950E-02
 H-1          302   0  3.32434E-02  293.6  end
 O-16         302   0  1.80329E-02  293.6  end
'Mg-24        302   0  1.05686E-04  293.6  end
'Mg-25        302   0  1.33797E-05  293.6  end
'Mg-26        302   0  1.47310E-05  293.6  end
Al-27         302   0  2.79375E-02  293.6  end
'Si-28        302   0  1.00274E-04  293.6  end
'Si-29        302   0  5.07732E-06  293.6  end
'Si-30        302   0  3.37038E-06  293.6  end
'Ti-46        302   0  4.20262E-07  293.6  end
'Ti-47        302   0  3.79000E-07  293.6  end
'Ti-48        302   0  3.75536E-06  293.6  end
'Ti-49        302   0  2.75590E-07  293.6  end
'Ti-50        302   0  2.63873E-07  293.6  end
'Cr-50        302   0  5.30517E-07  293.6  end
'Cr-52        302   0  1.02189E-05  293.6  end
'Cr-53        302   0  1.15860E-06  293.6  end
'Cr-54        302   0  2.87821E-07  293.6  end
'Mn-55        302   0  6.44602E-06  293.6  end
'Fe-54        302   0  2.34704E-06  293.6  end
'Fe-56        302   0  3.68104E-05  293.6  end
'Fe-57        302   0  8.50550E-07  293.6  end
'Fe-58        302   0  1.12337E-07  293.6  end
'Cu-63        302   0  1.87830E-05  293.6  end
'Cu-65        302   0  8.37182E-06  293.6  end
 U-234        302   0  5.42167E-06  293.6  end
 U-235        302   0  5.19778E-04  293.6  end
 U-236        302   0  2.16868E-06  293.6  end
 U-238        302   0  2.92770E-05  293.6  end
 Pu-239       302  0  5.98421E-07 300 end
Pu-240        302  0  3.13646E-08 300 end
'      total atom density =  8.01228E-02 a/b-cm
'  8.012280E-02
 H-1          303   0  3.32434E-02  293.6  end
 O-16         303   0  1.82870E-02  293.6  end
'Mg-24        303   0  1.05686E-04  293.6  end
'Mg-25        303   0  1.33797E-05  293.6  end
'Mg-26        303   0  1.47310E-05  293.6  end
Al-27         303   0  2.76228E-02  293.6  end
'Si-28        303   0  9.95724E-05  293.6  end
'Si-29        303   0  5.04178E-06  293.6  end
'Si-30        303   0  3.34679E-06  293.6  end
'Ti-46        303   0  4.20262E-07  293.6  end
'Ti-47        303   0  3.79000E-07  293.6  end
'Ti-48        303   0  3.75536E-06  293.6  end
'Ti-49        303   0  2.75590E-07  293.6  end
'Ti-50        303   0  2.63873E-07  293.6  end
'Cr-50        303   0  5.30517E-07  293.6  end
'Cr-52        303   0  1.02189E-05  293.6  end
'Cr-53        303   0  1.15860E-06  293.6  end
'Cr-54        303   0  2.87821E-07  293.6  end
'Mn-55        303   0  6.40711E-06  293.6  end
'Fe-54        303   0  2.32464E-06  293.6  end
'Fe-56        303   0  3.64591E-05  293.6  end
'Fe-57        303   0  8.42433E-07  293.6  end
'Fe-58        303   0  1.11265E-07  293.6  end
'Cu-63        303   0  1.86534E-05  293.6  end
'Cu-65        303   0  8.31405E-06  293.6  end
 U-234        303   0  6.37446E-06  293.6  end
 U-235        303   0  6.08578E-04  293.6  end
 U-236        303   0  2.54980E-06  293.6  end
 U-238        303   0  3.44221E-05  293.6  end
 Pu-239       303  0  5.98421E-07 300 end
Pu-240        303  0  3.13646E-08 300 end
'      total atom density =  8.01530E-02 a/b-cm
'  8.015300E-02
 H-1          304   0  3.32434E-02  293.6  end
 O-16         304   0  1.85176E-02  293.6  end
'Mg-24        304   0  1.05686E-04  293.6  end
'Mg-25        304   0  1.33797E-05  293.6  end
'Mg-26        304   0  1.47310E-05  293.6  end
Al-27         304   0  2.73372E-02  293.6  end
'Si-28        304   0  9.89350E-05  293.6  end
'Si-29        304   0  5.00951E-06  293.6  end
'Si-30        304   0  3.32537E-06  293.6  end
'Ti-46        304   0  4.20262E-07  293.6  end
'Ti-47        304   0  3.79000E-07  293.6  end
'Ti-48        304   0  3.75536E-06  293.6  end
'Ti-49        304   0  2.75590E-07  293.6  end
'Ti-50        304   0  2.63873E-07  293.6  end
'Cr-50        304   0  5.30517E-07  293.6  end
'Cr-52        304   0  1.02189E-05  293.6  end
'Cr-53        304   0  1.15860E-06  293.6  end
'Cr-54        304   0  2.87821E-07  293.6  end
'Mn-55        304   0  6.37178E-06  293.6  end
'Fe-54        304   0  2.30432E-06  293.6  end
'Fe-56        304   0  3.61403E-05  293.6  end
'Fe-57        304   0  8.35068E-07  293.6  end
'Fe-58        304   0  1.10292E-07  293.6  end
'Cu-63        304   0  1.85357E-05  293.6  end
'Cu-65        304   0  8.26161E-06  293.6  end
 U-234        304   0  7.23926E-06  293.6  end
 U-235        304   0  6.89178E-04  293.6  end
 U-236        304   0  2.89573E-06  293.6  end
 U-238        304   0  3.90920E-05  293.6  end
 Pu-239       304  0  5.98421E-07 300 end
Pu-240        304  0  3.13646E-08 300 end
'      total atom density =  8.01437E-02 a/b-cm
'  8.014370E-02
 H-1          305   0  3.32434E-02  293.6  end
 O-16         305   0  1.84469E-02  293.6  end
'Mg-24        305   0  1.05686E-04  293.6  end
'Mg-25        305   0  1.33797E-05  293.6  end
'Mg-26        305   0  1.47310E-05  293.6  end
Al-27         305   0  2.74247E-02  293.6  end
'Si-28        305   0  9.91306E-05  293.6  end
'Si-29        305   0  5.01941E-06  293.6  end
'Si-30        305   0  3.33194E-06  293.6  end
'Ti-46        305   0  4.20262E-07  293.6  end
'Ti-47        305   0  3.79000E-07  293.6  end
'Ti-48        305   0  3.75536E-06  293.6  end
'Ti-49        305   0  2.75590E-07  293.6  end
'Ti-50        305   0  2.63873E-07  293.6  end
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'Cr-50          305    0   5.30517E-07   293.6   end
'Cr-52          305    0   1.02189E-05   293.6   end
'Cr-53          305    0   1.15860E-06   293.6   end
'Cr-54          305    0   2.87821E-07   293.6   end
'Mn-55          305    0   6.38261E-06   293.6   end
'Fe-54          305    0   2.31055E-06   293.6   end
'Fe-56          305    0   3.62380E-05   293.6   end
'Fe-57          305    0   8.37326E-07   293.6   end
'Fe-58          305    0   1.10590E-07   293.6   end
'Cu-63          305    0   1.85717E-05   293.6   end
'Cu-65          305    0   8.27767E-06   293.6   end
 U-234          305    0   6.97424E-06   293.6   end
 U-235          305    0   6.64478E-04   293.6   end
 U-236          305    0   2.78972E-06   293.6   end
 U-238          305    0   3.76609E-05   293.6   end
 Pu-239         305  0  5.98421E-07 300 end
Pu-240          305  0  3.13646E-08 300 end
'       total atom density =  8.00985E-02 a/b-cm
'  8.009850E-02
 H-1            306    0   3.32434E-02   293.6   end
 O-16           306    0   1.81013E-02   293.6   end
'Mg-24          306    0   1.05686E-04   293.6   end
'Mg-25          306    0   1.33797E-05   293.6   end
'Mg-26          306    0   1.47310E-05   293.6   end
Al-27           306    0   2.78528E-02   293.6   end
'Si-28          306    0   1.00085E-04   293.6   end
'Si-29          306    0   5.06774E-06   293.6   end
'Si-30          306    0   3.36403E-06   293.6   end
'Ti-46          306    0   4.20262E-07   293.6   end
'Ti-47          306    0   3.79000E-07   293.6   end
'Ti-48          306    0   3.75536E-06   293.6   end
'Ti-49          306    0   2.75590E-07   293.6   end
'Ti-50          306    0   2.63873E-07   293.6   end
'Cr-50          306    0   5.30517E-07   293.6   end
'Cr-52          306    0   1.02189E-05   293.6   end
'Cr-53          306    0   1.15860E-06   293.6   end
'Cr-54          306    0   2.87821E-07   293.6   end
'Mn-55          306    0   6.43555E-06   293.6   end
'Fe-54          306    0   2.34101E-06   293.6   end
'Fe-56          306    0   3.67158E-05   293.6   end
'Fe-57          306    0   8.48365E-07   293.6   end
'Fe-58          306    0   1.12048E-07   293.6   end
'Cu-63          306    0   1.87481E-05   293.6   end
'Cu-65          306    0   8.35629E-06   293.6   end
 U-234          306    0   5.67811E-06   293.6   end
 U-235          306    0   5.43678E-04   293.6   end
 U-236          306    0   2.27126E-06   293.6   end
 U-238          306    0   3.06618E-05   293.6   end
 Pu-239         306  0  5.98421E-07 300 end
Pu-240          306  0  3.13646E-08 300 end
'       total atom density =  8.00555E-02 a/b-cm
'  8.005550E-02
 H-1            307    0   3.32434E-02   293.6   end
 O-16           307    0   1.77731E-02   293.6   end
'Mg-24          307    0   1.05686E-04   293.6   end
'Mg-25          307    0   1.33797E-05   293.6   end
'Mg-26          307    0   1.47310E-05   293.6   end
Al-27           307    0   2.82593E-02   293.6   end
'Si-28          307    0   1.00993E-04   293.6   end
'Si-29          307    0   5.11370E-06   293.6   end
'Si-30          307    0   3.39453E-06   293.6   end
'Ti-46          307    0   4.20262E-07   293.6   end
'Ti-47          307    0   3.79000E-07   293.6   end
'Ti-48          307    0   3.75536E-06   293.6   end
'Ti-49          307    0   2.75590E-07   293.6   end
'Ti-50          307    0   2.63873E-07   293.6   end
'Cr-50          307    0   5.30517E-07   293.6   end
'Cr-52          307    0   1.02189E-05   293.6   end
'Cr-53          307    0   1.15860E-06   293.6   end
'Cr-54          307    0   2.87821E-07   293.6   end
'Mn-55          307    0   6.48581E-06   293.6   end
'Fe-54          307    0   2.36993E-06   293.6   end
'Fe-56          307    0   3.71695E-05   293.6   end
'Fe-57          307    0   8.58848E-07   293.6   end
'Fe-58          307    0   1.13433E-07   293.6   end
'Cu-63          307    0   1.89155E-05   293.6   end
'Cu-65          307    0   8.43090E-06   293.6   end
 U-234          307    0   4.44742E-06   293.6   end
 U-235          307    0   4.28978E-04   293.6   end
 U-236          307    0   1.77898E-06   293.6   end
 U-238          307    0   2.40161E-05   293.6   end
 Pu-239         307  0  5.98421E-07 300 end
Pu-240          307  0  3.13646E-08 300 end
'       total atom density =  8.00271E-02 a/b-cm
'  8.002710E-02
 H-1            308    0   3.32434E-02   293.6   end
 O-16           308    0   1.75562E-02   293.6   end
'Mg-24          308    0   1.05686E-04   293.6   end
'Mg-25          308    0   1.33797E-05   293.6   end
'Mg-26          308    0   1.47310E-05   293.6   end
Al-27           308    0   2.85280E-02   293.6   end
'Si-28          308    0   1.01591E-04   293.6   end
'Si-29          308    0   5.14401E-06   293.6   end
'Si-30          308    0   3.41465E-06   293.6   end
'Ti-46          308    0   4.20262E-07   293.6   end
'Ti-47          308    0   3.79000E-07   293.6   end
'Ti-48          308    0   3.75536E-06   293.6   end
'Ti-49          308    0   2.75590E-07   293.6   end
'Ti-50          308    0   2.63873E-07   293.6   end
'Cr-50          308    0   5.30517E-07   293.6   end
'Cr-52          308    0   1.02189E-05   293.6   end
'Cr-53          308    0   1.15860E-06   293.6   end
'Cr-54          308    0   2.87821E-07   293.6   end
'Mn-55          308    0   6.51903E-06   293.6   end
'Fe-54          308    0   2.38905E-06   293.6   end
'Fe-56          308    0   3.74693E-05   293.6   end
'Fe-57          308    0   8.65776E-07   293.6   end
'Fe-58          308    0   1.14348E-07   293.6   end
'Cu-63          308    0   1.90262E-05   293.6   end
'Cu-65          308    0   8.48022E-06   293.6   end
 U-234          308    0   3.63412E-06   293.6   end
 U-235          308    0   3.53178E-04   293.6   end
 U-236          308    0   1.45366E-06   293.6   end
 U-238          308    0   1.96242E-05   293.6   end
 Pu-239         308  0  5.98421E-07 300 end
Pu-240          308  0  3.13646E-08 300 end
'       total atom density =  8.00013E-02 a/b-cm
'  8.000130E-02
 H-1            309    0   3.32434E-02   293.6   end
 O-16           309    0   1.73591E-02   293.6   end
'Mg-24          309    0   1.05686E-04   293.6   end
'Mg-25          309    0   1.33797E-05   293.6   end
'Mg-26          309    0   1.47310E-05   293.6   end
Al-27           309    0   2.87722E-02   293.6   end
'Si-28          309    0   1.02136E-04   293.6   end
'Si-29          309    0   5.17160E-06   293.6   end
'Si-30          309    0   3.43297E-06   293.6   end
'Ti-46          309    0   4.20262E-07   293.6   end
'Ti-47          309    0   3.79000E-07   293.6   end
'Ti-48          309    0   3.75536E-06   293.6   end
'Ti-49          309    0   2.75590E-07   293.6   end
'Ti-50          309    0   2.63873E-07   293.6   end
'Cr-50          309    0   5.30517E-07   293.6   end
'Cr-52          309    0   1.02189E-05   293.6   end
'Cr-53          309    0   1.15860E-06   293.6   end
'Cr-54          309    0   2.87821E-07   293.6   end
'Mn-55          309    0   6.54922E-06   293.6   end
'Fe-54          309    0   2.40643E-06   293.6   end
'Fe-56          309    0   3.77418E-05   293.6   end
'Fe-57          309    0   8.72072E-07   293.6   end
'Fe-58          309    0   1.15179E-07   293.6   end
'Cu-63          309    0   1.91268E-05   293.6   end
'Cu-65          309    0   8.52504E-06   293.6   end
 U-234          309    0   2.89485E-06   293.6   end
 U-235          309    0   2.84278E-04   293.6   end
 U-236          309    0   1.15795E-06   293.6   end
 U-238          309    0   1.56322E-05   293.6   end
 Pu-239         309  0  5.98421E-07 300 end
Pu-240          309  0  3.13646E-08 300 end
'
'
end comp
read parm gen=225 nsk=25 npg=1500 run=yes plt=yes tme=1000 end parm
read geom
global unit 1
com=!11-ft 6-in diameter tank!
'Assume tank 6.4D is 11' 6" outside diameter (175.26 cm radius)
'Assume tank 6.4D is 3/4" (1.905 cm) thick SS (inner radius of 173.355 cm)
'The solution height is rounded to 223 cm to account for the height of
'    units 4 and 5 (162.43 + 2.54) and the distance from the bottom of the wells
'    to the bottom of the tank (57.15 cm)
'The tank height is rounded to 245 cm (96.45" from dimension memo)
'The room (void) is 10" (25.4 cm) larger than the tank on the sides
'There is 1 inch void on top and bottom of the tank
'There is 2 feet concrete surrounding the void
'The bottom of the wells are 22.5" (57.15 cm) above the bottom of the tank
'The spacing between wells is 80.3389 cm (half distance 40.1694 cm)
cylinder   1 173.355   223       0.00
hole   5   origin x=-40.1694 y=0 z=57.15
hole   4   origin x=40.1694  y=0 z=57.15
cylinder   2 173.355   245       0.00
cylinder   3 175.26    246.905  -1.905
cuboid     4 4p200.66  249.445  -4.445
cuboid     5 4p261.62  310.405  -65.405
media 4 1 1
media 0 1 2 -1
media 6 1 3 -2 -1
media 0 1 4 -3 -2 -1
media 2 1 5 -4 -3 -2 -1
boundary 5
unit 2
' X Post (large post for outer element)
```

```
'Assume ID is 11.5888 cm (dimension memo)
'Assume OD is 12.5044 cm (dimension memo)
'Assume height is 2' 6 1/2" (77.47 cm) per S5-2-3616
'Assume there is no cone, top, or bottom to the post
cylinder  1 11.5888 77.47 0
cylinder  2 12.5044 77.47 0
media 4 1 1
media 6 1 2 -1
boundary  2
unit 3
' Y Post (small post for inner element)
'Assume ID is 4.2863 cm (dimension memo)
'Assume OD is 5.2260 cm (dimension memo)
'Assume height is 2' 6 1/2" (77.47 cm) per S5-2-3616
'Assume there is no cone, top, or bottom to the post
cylinder  1 4.2863 77.47 0
cylinder  2 5.2260 77.47 0
media 4 1 1
media 6 1 2 -1
boundary 2
unit 4
' X Well (large well for outer element)
'ID is 22.4854 cm (dimension memo)
'OD is 23.8125 cm (dimension memo)
'Height is 162.433 cm (dimension memo)
'Bottom of well is 1" (2.54 cm) per S5-2-3612
cylinder 1 22.4854 162.433 0
hole 3000 origin x=0 y=0 z=25.4
cylinder 2 23.8125 162.433 -2.54
media 4 1 1
media 11 1 2 -1
boundary 2
unit 5
' Y Well (small well for inner element)
'ID is 15.7481 cm (dimension memo)
'OD is 16.3512 cm (dimension memo)
'Height is 162.433 cm (dimension memo)
'Bottom of well is 1" (2.54 cm) per S5-2-3612
cylinder 1 15.7481 162.433 0
hole 2000 origin x=0 y=0 z=25.4
cylinder 2 16.3512 162.433 -2.54
media 4 1 1
media 10 1 2 -1
boundary 2
unit 2000
com='Inner Fuel Element'
'    inner unfuelled region
cylinder   2100  7.14       25.4       -25.4
hole         3 origin x=0 y=0 z=-25.4
media        4    1    2100
'
'     Top -  Axial Layer 1  (25.4  - 25.0 cm)
cylinder   2101  7.5        25.4       25.0
cylinder   2102  8.0        25.4       25.0
cylinder   2103  8.5        25.4       25.0
cylinder   2104  9.5        25.4       25.0
cylinder   2105 10.5        25.4       25.0
cylinder   2106 11.5        25.4       25.0
cylinder   2107 12.0        25.4       25.0
cylinder   2108 12.60       25.4       25.0
media      211    1    2101   -2100
media      212    1    2102   -2101
media      213    1    2103   -2102
media      214    1    2104   -2103
media      215    1    2105   -2104
media      216    1    2106   -2105
media      217    1    2107   -2106
media      218    1    2108   -2107
'
'     Top -  Axial Layer 2  (25.0  - 22.0 cm)
cylinder   2111  7.5        25.4       22.0
cylinder   2112  8.0        25.4       22.0
cylinder   2113  8.5        25.4       22.0
cylinder   2114  9.5        25.4       22.0
cylinder   2115 10.5        25.4       22.0
cylinder   2116 11.5        25.4       22.0
cylinder   2117 12.0        25.4       22.0
cylinder   2118 12.60       25.4       22.0
media      221    1    2111   -2100   -2108
media      222    1    2112   -2111   -2108
media      223    1    2113   -2112   -2108
media      224    1    2114   -2113   -2108
media      225    1    2115   -2114   -2108
media      226    1    2116   -2115   -2108
media      227    1    2117   -2116   -2108
media      228    1    2118   -2117   -2108
'
'     Top -  Axial Layer 3  (22.0  - 19.0 cm)
cylinder   2121  7.5        25.4       19.0
cylinder   2122  8.0        25.4       19.0
cylinder   2123  8.5        25.4       19.0
cylinder   2124  9.5        25.4       19.0
cylinder   2125 10.5        25.4       19.0
cylinder   2126 11.5        25.4       19.0
cylinder   2127 12.0        25.4       19.0
cylinder   2128 12.60       25.4       19.0
media      231    1    2121   -2100   -2118
media      232    1    2122   -2121   -2118
media      233    1    2123   -2122   -2118
media      234    1    2124   -2123   -2118
media      235    1    2125   -2124   -2118
media      236    1    2126   -2125   -2118
media      237    1    2127   -2126   -2118
media      238    1    2128   -2127   -2118
'
'     Top -  Axial Layer 4  (19.0 - 16.0 cm)
cylinder   2131  7.5        25.4       16.0
cylinder   2132  8.0        25.4       16.0
cylinder   2133  8.5        25.4       16.0
cylinder   2134  9.5        25.4       16.0
cylinder   2135 10.5        25.4       16.0
cylinder   2136 11.5        25.4       16.0
cylinder   2137 12.0        25.4       16.0
cylinder   2138 12.60       25.4       16.0
media      241    1    2131   -2100   -2128
media      242    1    2132   -2131   -2128
media      243    1    2133   -2132   -2128
media      244    1    2134   -2133   -2128
media      245    1    2135   -2134   -2128
media      246    1    2136   -2135   -2128
media      247    1    2137   -2136   -2128
media      248    1    2138   -2137   -2128
'
'     Top -  Axial Layer 5  (16.0  - 13.0 cm)
cylinder   2141  7.5        25.4       13.0
cylinder   2142  8.0        25.4       13.0
cylinder   2143  8.5        25.4       13.0
cylinder   2144  9.5        25.4       13.0
cylinder   2145 10.5        25.4       13.0
cylinder   2146 11.5        25.4       13.0
cylinder   2147 12.0        25.4       13.0
cylinder   2148 12.60       25.4       13.0
media      251    1    2141   -2100   -2138
media      252    1    2142   -2141   -2138
media      253    1    2143   -2142   -2138
media      254    1    2144   -2143   -2138
media      255    1    2145   -2144   -2138
media      256    1    2146   -2145   -2138
media      257    1    2147   -2146   -2138
media      258    1    2148   -2147   -2138
'
'     Top -  Axial Layer 6  (13.0  - 10.0 cm)
cylinder   2151  7.5        25.4       10.0
cylinder   2152  8.0        25.4       10.0
cylinder   2153  8.5        25.4       10.0
cylinder   2154  9.5        25.4       10.0
cylinder   2155 10.5        25.4       10.0
cylinder   2156 11.5        25.4       10.0
cylinder   2157 12.0        25.4       10.0
cylinder   2158 12.60       25.4       10.0
media      261    1    2151   -2100   -2148
media      262    1    2152   -2151   -2148
media      263    1    2153   -2152   -2148
media      264    1    2154   -2153   -2148
media      265    1    2155   -2154   -2148
media      266    1    2156   -2155   -2148
media      267    1    2157   -2156   -2148
media      268    1    2158   -2157   -2148
'
'     Top -  Axial Layer 7  (10.0  -  7.0  cm)
cylinder   2161  7.5        25.4       7.0
cylinder   2162  8.0        25.4       7.0
cylinder   2163  8.5        25.4       7.0
cylinder   2164  9.5        25.4       7.0
cylinder   2165 10.5        25.4       7.0
cylinder   2166 11.5        25.4       7.0
cylinder   2167 12.0        25.4       7.0
cylinder   2168 12.60       25.4       7.0
media      271    1    2161   -2100   -2158
media      272    1    2162   -2161   -2158
media      273    1    2163   -2162   -2158
media      274    1    2164   -2163   -2158
media      275    1    2165   -2164   -2158
media      276    1    2166   -2165   -2158
media      277    1    2167   -2166   -2158
media      278    1    2168   -2167   -2158
'
'     Top -  Axial Layer 8  (7.0  - 4.0 cm)
cylinder   2171  7.5        25.4       4.0
cylinder   2172  8.0        25.4       4.0
cylinder   2173  8.5        25.4       4.0
cylinder   2174  9.5        25.4       4.0
```

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cylinder  2175 10.5      25.4       4.0
cylinder  2176 11.5      25.4       4.0
cylinder  2177 12.0      25.4       4.0
cylinder  2178 12.60     25.4       4.0
media     281   1   2171  -2100  -2168
media     282   1   2172  -2171  -2168
media     283   1   2173  -2172  -2168
media     284   1   2174  -2173  -2168
media     285   1   2175  -2174  -2168
media     286   1   2176  -2175  -2168
media     287   1   2177  -2176  -2168
media     288   1   2178  -2177  -2168
'
'    Top -  Axial Layer 9  (4.0  -  1.0  cm)
cylinder  2181  7.5      25.4       1.0
cylinder  2182  8.0      25.4       1.0
cylinder  2183  8.5      25.4       1.0
cylinder  2184  9.5      25.4       1.0
cylinder  2185 10.5      25.4       1.0
cylinder  2186 11.5      25.4       1.0
cylinder  2187 12.0      25.4       1.0
cylinder  2188 12.60     25.4       1.0
media     291   1   2181  -2100  -2178
media     292   1   2182  -2181  -2178
media     293   1   2183  -2182  -2178
media     294   1   2184  -2183  -2178
media     295   1   2185  -2184  -2178
media     296   1   2186  -2185  -2178
media     297   1   2187  -2186  -2178
media     298   1   2188  -2187  -2178
'
'    Top -  Axial Layer 10  (+1.0  -  -1.0 cm)
cylinder  2191  7.5      25.4      -1.0
cylinder  2192  8.0      25.4      -1.0
cylinder  2193  8.5      25.4      -1.0
cylinder  2194  9.5      25.4      -1.0
cylinder  2195 10.5      25.4      -1.0
cylinder  2196 11.5      25.4      -1.0
cylinder  2197 12.0      25.4      -1.0
cylinder  2198 12.60     25.4      -1.0
media     201   1   2191  -2100  -2188
media     202   1   2192  -2191  -2188
media     203   1   2193  -2192  -2188
media     204   1   2194  -2193  -2188
media     205   1   2195  -2194  -2188
media     206   1   2196  -2195  -2188
media     207   1   2197  -2196  -2188
media     208   1   2198  -2197  -2188
'
'    Top -  Axial Layer 11  (-1.0  -  -4.0 cm)
cylinder  2201  7.5      25.4      -4.0
cylinder  2202  8.0      25.4      -4.0
cylinder  2203  8.5      25.4      -4.0
cylinder  2204  9.5      25.4      -4.0
cylinder  2205 10.5      25.4      -4.0
cylinder  2206 11.5      25.4      -4.0
cylinder  2207 12.0      25.4      -4.0
cylinder  2208 12.60     25.4      -4.0
media     291   1   2201  -2100  -2198
media     292   1   2202  -2201  -2198
media     293   1   2203  -2202  -2198
media     294   1   2204  -2203  -2198
media     295   1   2205  -2204  -2198
media     296   1   2206  -2205  -2198
media     297   1   2207  -2206  -2198
media     298   1   2208  -2207  -2198
'
'    Top -  Axial Layer 12  (-4.0  -  7.0 cm)
cylinder  2211  7.5      25.4      -7.0
cylinder  2212  8.0      25.4      -7.0
cylinder  2213  8.5      25.4      -7.0
cylinder  2214  9.5      25.4      -7.0
cylinder  2215 10.5      25.4      -7.0
cylinder  2216 11.5      25.4      -7.0
cylinder  2217 12.0      25.4      -7.0
cylinder  2218 12.60     25.4      -7.0
media     281   1   2211  -2100  -2208
media     282   1   2212  -2211  -2208
media     283   1   2213  -2212  -2208
media     284   1   2214  -2213  -2208
media     285   1   2215  -2214  -2208
media     286   1   2216  -2215  -2208
media     287   1   2217  -2216  -2208
media     288   1   2218  -2217  -2208
'
'    Top -  Axial Layer 13  (-7.0  -  -10.0 cm)
cylinder  2221  7.5      25.4     -10.0
cylinder  2222  8.0      25.4     -10.0
cylinder  2223  8.5      25.4     -10.0
cylinder  2224  9.5      25.4     -10.0
cylinder  2225 10.5      25.4     -10.0
cylinder  2226 11.5      25.4     -10.0
cylinder  2227 12.0      25.4     -10.0
cylinder  2228 12.60     25.4     -10.0
media     271   1   2221  -2100  -2218
media     272   1   2222  -2221  -2218
media     273   1   2223  -2222  -2218
media     274   1   2224  -2223  -2218
media     275   1   2225  -2224  -2218
media     276   1   2226  -2225  -2218
media     277   1   2227  -2226  -2218
media     278   1   2228  -2227  -2218
'
'    Top -  Axial Layer 14  (-10.0  -  -13.0 cm)
cylinder  2231  7.5      25.4     -13.0
cylinder  2232  8.0      25.4     -13.0
cylinder  2233  8.5      25.4     -13.0
cylinder  2234  9.5      25.4     -13.0
cylinder  2235 10.5      25.4     -13.0
cylinder  2236 11.5      25.4     -13.0
cylinder  2237 12.0      25.4     -13.0
cylinder  2238 12.60     25.4     -13.0
media     261   1   2231  -2100  -2228
media     262   1   2232  -2231  -2228
media     263   1   2233  -2232  -2228
media     264   1   2234  -2233  -2228
media     265   1   2235  -2234  -2228
media     266   1   2236  -2235  -2228
media     267   1   2237  -2236  -2228
media     268   1   2238  -2237  -2228
'
'    Top -  Axial Layer 15  (-13.0  -  -16.0 cm)
cylinder  2241  7.5      25.4     -16.0
cylinder  2242  8.0      25.4     -16.0
cylinder  2243  8.5      25.4     -16.0
cylinder  2244  9.5      25.4     -16.0
cylinder  2245 10.5      25.4     -16.0
cylinder  2246 11.5      25.4     -16.0
cylinder  2247 12.0      25.4     -16.0
cylinder  2248 12.60     25.4     -16.0
media     251   1   2241  -2100  -2238
media     252   1   2242  -2241  -2238
media     253   1   2243  -2242  -2238
media     254   1   2244  -2243  -2238
media     255   1   2245  -2244  -2238
media     256   1   2246  -2245  -2238
media     257   1   2247  -2246  -2238
media     258   1   2248  -2247  -2238
'
'    Top -  Axial Layer 16  (-16.0  - -19.0 cm)
cylinder  2251  7.5      25.4     -19.0
cylinder  2252  8.0      25.4     -19.0
cylinder  2253  8.5      25.4     -19.0
cylinder  2254  9.5      25.4     -19.0
cylinder  2255 10.5      25.4     -19.0
cylinder  2256 11.5      25.4     -19.0
cylinder  2257 12.0      25.4     -19.0
cylinder  2258 12.60     25.4     -19.0
media     241   1   2251  -2100  -2248
media     242   1   2252  -2251  -2248
media     243   1   2253  -2252  -2248
media     244   1   2254  -2253  -2248
media     245   1   2255  -2254  -2248
media     246   1   2256  -2255  -2248
media     247   1   2257  -2256  -2248
media     248   1   2258  -2257  -2248
'
'    Top -  Axial Layer 17  (-19.0  - 22.0 cm)
cylinder  2261  7.5      25.4     -22.0
cylinder  2262  8.0      25.4     -22.0
cylinder  2263  8.5      25.4     -22.0
cylinder  2264  9.5      25.4     -22.0
cylinder  2265 10.5      25.4     -22.0
cylinder  2266 11.5      25.4     -22.0
cylinder  2267 12.0      25.4     -22.0
cylinder  2268 12.60     25.4     -22.0
media     231   1   2261  -2100  -2258
media     232   1   2262  -2261  -2258
media     233   1   2263  -2262  -2258
media     234   1   2264  -2263  -2258
media     235   1   2265  -2264  -2258
media     236   1   2266  -2265  -2258
media     237   1   2267  -2266  -2258
media     238   1   2268  -2267  -2258
'
'    Top -  Axial Layer 18  (-22.0  - 25.0 cm)
cylinder  2271  7.5      25.4     -25.0
cylinder  2272  8.0      25.4     -25.0
cylinder  2273  8.5      25.4     -25.0
cylinder  2274  9.5      25.4     -25.0
cylinder  2275 10.5      25.4     -25.0
cylinder  2276 11.5      25.4     -25.0
```

```
cylinder  2277 12.0       25.4      -25.0
cylinder  2278 12.60      25.4      -25.0
media      221    1   2271  -2100  -2268
media      222    1   2272  -2271  -2268
media      223    1   2273  -2272  -2268
media      224    1   2274  -2273  -2268
media      225    1   2275  -2274  -2268
media      226    1   2276  -2275  -2268
media      227    1   2277  -2276  -2268
media      228    1   2278  -2277  -2268
'
'    Top -  Axial Layer 19  (-25.0  -  -25.4 cm)
cylinder  2281  7.5       25.4      -25.4
cylinder  2282  8.0       25.4      -25.4
cylinder  2283  8.5       25.4      -25.4
cylinder  2284  9.5       25.4      -25.4
cylinder  2285 10.5       25.4      -25.4
cylinder  2286 11.5       25.4      -25.4
cylinder  2287 12.0       25.4      -25.4
cylinder  2288 12.60      25.4      -25.4
media      211    1   2281  -2100  -2278
media      212    1   2282  -2281  -2278
media      213    1   2283  -2282  -2278
media      214    1   2284  -2283  -2278
media      215    1   2285  -2284  -2278
media      216    1   2286  -2285  -2278
media      217    1   2287  -2286  -2278
media      218    1   2288  -2287  -2278
cylinder  2289 12.60      54.6      -25.4
media        4    1   2289  -2288
'
boundary 2289
unit 3000
com='Outer Fuel Element'
cylinder  2400 15.12951   25.4      -25.4
hole         2 origin x=0 y=0 z=-25.4
media        4    1   2400
'
'    Top - Axial  Layer 1    (25.4  - 25.0 cm)
cylinder  2401 15.5       25.4       25.0
cylinder  2402 16.0       25.4       25.0
cylinder  2403 16.5       25.4       25.0
cylinder  2404 17.5       25.4       25.0
cylinder  2405 18.5       25.4       25.0
cylinder  2406 19.5       25.4       25.0
cylinder  2407 20.0       25.4       25.0
cylinder  2408 20.5       25.4       25.0
cylinder  2409 20.978     25.4       25.0
media      311    1   2401  -2400
media      312    1   2402  -2401
media      313    1   2403  -2402
media      314    1   2404  -2403
media      315    1   2405  -2404
media      316    1   2406  -2405
media      317    1   2407  -2406
media      318    1   2408  -2407
media      319    1   2409  -2408
'
'    Top - Axial  Layer 2    (25.0  - 22.0 cm)
cylinder  2411 15.5       25.4       22.0
cylinder  2412 16.0       25.4       22.0
cylinder  2413 16.5       25.4       22.0
cylinder  2414 17.5       25.4       22.0
cylinder  2415 18.5       25.4       22.0
cylinder  2416 19.5       25.4       22.0
cylinder  2417 20.0       25.4       22.0
cylinder  2418 20.5       25.4       22.0
cylinder  2419 20.978     25.4       22.0
media      321    1   2411  -2400  -2409
media      322    1   2412  -2411  -2409
media      323    1   2413  -2412  -2409
media      324    1   2414  -2413  -2409
media      325    1   2415  -2414  -2409
media      326    1   2416  -2415  -2409
media      327    1   2417  -2416  -2409
media      328    1   2418  -2417  -2409
media      329    1   2419  -2418  -2409
'
'    Top - Axial  Layer 3    (22.0  - 19.0 cm)
cylinder  2421 15.5       25.4       19.0
cylinder  2422 16.0       25.4       19.0
cylinder  2423 16.5       25.4       19.0
cylinder  2424 17.5       25.4       19.0
cylinder  2425 18.5       25.4       19.0
cylinder  2426 19.5       25.4       19.0
cylinder  2427 20.0       25.4       19.0
cylinder  2428 20.5       25.4       19.0
cylinder  2429 20.978     25.4       19.0
media      331    1   2421  -2400  -2419
media      332    1   2422  -2421  -2419
media      333    1   2423  -2422  -2419
media      334    1   2424  -2423  -2419
media      335    1   2425  -2424  -2419
media      336    1   2426  -2425  -2419
media      337    1   2427  -2426  -2419
media      338    1   2428  -2427  -2419
media      339    1   2429  -2428  -2419
'
'    Top - Axial  Layer 4    (19.0  - 16.0 cm)
cylinder  2431 15.5       25.4       16.0
cylinder  2432 16.0       25.4       16.0
cylinder  2433 16.5       25.4       16.0
cylinder  2434 17.5       25.4       16.0
cylinder  2435 18.5       25.4       16.0
cylinder  2436 19.5       25.4       16.0
cylinder  2437 20.0       25.4       16.0
cylinder  2438 20.5       25.4       16.0
cylinder  2439 20.978     25.4       16.0
media      341    1   2431  -2400  -2429
media      342    1   2432  -2431  -2429
media      343    1   2433  -2432  -2429
media      344    1   2434  -2433  -2429
media      345    1   2435  -2434  -2429
media      346    1   2436  -2435  -2429
media      347    1   2437  -2436  -2429
media      348    1   2438  -2437  -2429
media      349    1   2439  -2438  -2429
'
'    Top - Axial  Layer 5    (16.0  - 13.0 cm)
cylinder  2441 15.5       25.4       13.0
cylinder  2442 16.0       25.4       13.0
cylinder  2443 16.5       25.4       13.0
cylinder  2444 17.5       25.4       13.0
cylinder  2445 18.5       25.4       13.0
cylinder  2446 19.5       25.4       13.0
cylinder  2447 20.0       25.4       13.0
cylinder  2448 20.5       25.4       13.0
cylinder  2449 20.978     25.4       13.0
media      351    1   2441  -2400  -2439
media      352    1   2442  -2441  -2439
media      353    1   2443  -2442  -2439
media      354    1   2444  -2443  -2439
media      355    1   2445  -2444  -2439
media      356    1   2446  -2445  -2439
media      357    1   2447  -2446  -2439
media      358    1   2448  -2447  -2439
media      359    1   2449  -2448  -2439
'
'    Top - Axial  Layer 6    (13.0  - 10.0 cm)
cylinder  2451 15.5       25.4       10.0
cylinder  2452 16.0       25.4       10.0
cylinder  2453 16.5       25.4       10.0
cylinder  2454 17.5       25.4       10.0
cylinder  2455 18.5       25.4       10.0
cylinder  2456 19.5       25.4       10.0
cylinder  2457 20.0       25.4       10.0
cylinder  2458 20.5       25.4       10.0
cylinder  2459 20.978     25.4       10.0
media      361    1   2451  -2400  -2449
media      362    1   2452  -2451  -2449
media      363    1   2453  -2452  -2449
media      364    1   2454  -2453  -2449
media      365    1   2455  -2454  -2449
media      366    1   2456  -2455  -2449
media      367    1   2457  -2456  -2449
media      368    1   2458  -2457  -2449
media      369    1   2459  -2458  -2449
'
'    Top - Axial  Layer 7    (10.0  - 7.0 cm)
cylinder  2461 15.5       25.4       7.0
cylinder  2462 16.0       25.4       7.0
cylinder  2463 16.5       25.4       7.0
cylinder  2464 17.5       25.4       7.0
cylinder  2465 18.5       25.4       7.0
cylinder  2466 19.5       25.4       7.0
cylinder  2467 20.0       25.4       7.0
cylinder  2468 20.5       25.4       7.0
cylinder  2469 20.978     25.4       7.0
media      371    1   2461  -2400  -2459
media      372    1   2462  -2461  -2459
media      373    1   2463  -2462  -2459
media      374    1   2464  -2463  -2459
media      375    1   2465  -2464  -2459
media      376    1   2466  -2465  -2459
media      377    1   2467  -2466  -2459
media      378    1   2468  -2467  -2459
media      379    1   2469  -2468  -2459
'
'    Top - Axial  Layer 8    (7.0  - 4.0 cm)
cylinder  2471 15.5       25.4       4.0
cylinder  2472 16.0       25.4       4.0
cylinder  2473 16.5       25.4       4.0
```

```
cylinder  2474 17.5       25.4       4.0
cylinder  2475 18.5       25.4       4.0
cylinder  2476 19.5       25.4       4.0
cylinder  2477 20.0       25.4       4.0
cylinder  2478 20.5       25.4       4.0
cylinder  2479 20.978     25.4       4.0
media     381  1  2471  -2400  -2469
media     382  1  2472  -2471  -2469
media     383  1  2473  -2472  -2469
media     384  1  2474  -2473  -2469
media     385  1  2475  -2474  -2469
media     386  1  2476  -2475  -2469
media     387  1  2477  -2476  -2469
media     388  1  2478  -2477  -2469
media     389  1  2479  -2478  -2469
'
'    Top - Axial  Layer 9    (4.0  - 1.0 cm)
cylinder  2481 15.5       25.4       1.0
cylinder  2482 16.0       25.4       1.0
cylinder  2483 16.5       25.4       1.0
cylinder  2484 17.5       25.4       1.0
cylinder  2485 18.5       25.4       1.0
cylinder  2486 19.5       25.4       1.0
cylinder  2487 20.0       25.4       1.0
cylinder  2488 20.5       25.4       1.0
cylinder  2489 20.978     25.4       1.0
media     391  1  2481  -2400  -2479
media     392  1  2482  -2481  -2479
media     393  1  2483  -2482  -2479
media     394  1  2484  -2483  -2479
media     395  1  2485  -2484  -2479
media     396  1  2486  -2485  -2479
media     397  1  2487  -2486  -2479
media     398  1  2488  -2487  -2479
media     399  1  2489  -2488  -2479
'
'    Top - Axial  Layer 10   (1.0  - 1.0 cm)
cylinder  2491 15.5       25.4       -1.0
cylinder  2492 16.0       25.4       -1.0
cylinder  2493 16.5       25.4       -1.0
cylinder  2494 17.5       25.4       -1.0
cylinder  2495 18.5       25.4       -1.0
cylinder  2496 19.5       25.4       -1.0
cylinder  2497 20.0       25.4       -1.0
cylinder  2498 20.5       25.4       -1.0
cylinder  2499 20.978     25.4       -1.0
media     301  1  2491  -2400  -2489
media     302  1  2492  -2491  -2489
media     303  1  2493  -2492  -2489
media     304  1  2494  -2493  -2489
media     305  1  2495  -2494  -2489
media     306  1  2496  -2495  -2489
media     307  1  2497  -2496  -2489
media     308  1  2498  -2497  -2489
media     309  1  2499  -2498  -2489
'
'    Top - Axial  Layer 11   (-1.0  -  -4.0 cm)
cylinder  2501 15.5       25.4       -4.0
cylinder  2502 16.0       25.4       -4.0
cylinder  2503 16.5       25.4       -4.0
cylinder  2504 17.5       25.4       -4.0
cylinder  2505 18.5       25.4       -4.0
cylinder  2506 19.5       25.4       -4.0
cylinder  2507 20.0       25.4       -4.0
cylinder  2508 20.5       25.4       -4.0
cylinder  2509 20.978     25.4       -4.0
media     391  1  2501  -2400  -2499
media     392  1  2502  -2501  -2499
media     393  1  2503  -2502  -2499
media     394  1  2504  -2503  -2499
media     395  1  2505  -2504  -2499
media     396  1  2506  -2505  -2499
media     397  1  2507  -2506  -2499
media     398  1  2508  -2507  -2499
media     399  1  2509  -2508  -2499
'
'    Top - Axial  Layer 12   (-4.0  - -7.0 cm)
cylinder  2511 15.5       25.4       -7.0
cylinder  2512 16.0       25.4       -7.0
cylinder  2513 16.5       25.4       -7.0
cylinder  2514 17.5       25.4       -7.0
cylinder  2515 18.5       25.4       -7.0
cylinder  2516 19.5       25.4       -7.0
cylinder  2517 20.0       25.4       -7.0
cylinder  2518 20.5       25.4       -7.0
cylinder  2519 20.978     25.4       -7.0
media     381  1  2511  -2400  -2509
media     382  1  2512  -2511  -2509
media     383  1  2513  -2512  -2509
media     384  1  2514  -2513  -2509
media     385  1  2515  -2514  -2509
media     386  1  2516  -2515  -2509
media     387  1  2517  -2516  -2509
media     388  1  2518  -2517  -2509
media     389  1  2519  -2518  -2509
'
'    Top - Axial  Layer 13   (-7.0  -  -10.0 cm)
cylinder  2521 15.5       25.4       -10.0
cylinder  2522 16.0       25.4       -10.0
cylinder  2523 16.5       25.4       -10.0
cylinder  2524 17.5       25.4       -10.0
cylinder  2525 18.5       25.4       -10.0
cylinder  2526 19.5       25.4       -10.0
cylinder  2527 20.0       25.4       -10.0
cylinder  2528 20.5       25.4       -10.0
cylinder  2529 20.978     25.4       -10.0
media     371  1  2521  -2400  -2519
media     372  1  2522  -2521  -2519
media     373  1  2523  -2522  -2519
media     374  1  2524  -2523  -2519
media     375  1  2525  -2524  -2519
media     376  1  2526  -2525  -2519
media     377  1  2527  -2526  -2519
media     378  1  2528  -2527  -2519
media     379  1  2529  -2528  -2519
'
'    Top - Axial  Layer 14   (-10.0  -  -13.0 cm)
cylinder  2531 15.5       25.4       -13.0
cylinder  2532 16.0       25.4       -13.0
cylinder  2533 16.5       25.4       -13.0
cylinder  2534 17.5       25.4       -13.0
cylinder  2535 18.5       25.4       -13.0
cylinder  2536 19.5       25.4       -13.0
cylinder  2537 20.0       25.4       -13.0
cylinder  2538 20.5       25.4       -13.0
cylinder  2539 20.978     25.4       -13.0
media     361  1  2531  -2400  -2529
media     362  1  2532  -2531  -2529
media     363  1  2533  -2532  -2529
media     364  1  2534  -2533  -2529
media     365  1  2535  -2534  -2529
media     366  1  2536  -2535  -2529
media     367  1  2537  -2536  -2529
media     368  1  2538  -2537  -2529
media     369  1  2539  -2538  -2529
'
'    Top - Axial  Layer 15   (-13.0  -  -16.0 cm)
cylinder  2541 15.5       25.4       -16.0
cylinder  2542 16.0       25.4       -16.0
cylinder  2543 16.5       25.4       -16.0
cylinder  2544 17.5       25.4       -16.0
cylinder  2545 18.5       25.4       -16.0
cylinder  2546 19.5       25.4       -16.0
cylinder  2547 20.0       25.4       -16.0
cylinder  2548 20.5       25.4       -16.0
cylinder  2549 20.978     25.4       -16.0
media     351  1  2541  -2400  -2539
media     352  1  2542  -2541  -2539
media     353  1  2543  -2542  -2539
media     354  1  2544  -2543  -2539
media     355  1  2545  -2544  -2539
media     356  1  2546  -2545  -2539
media     357  1  2547  -2546  -2539
media     358  1  2548  -2547  -2539
media     359  1  2549  -2548  -2539
'
'    Top - Axial  Layer 16   (-16.0  - 19.0 cm)
cylinder  2551 15.5       25.4       -19.0
cylinder  2552 16.0       25.4       -19.0
cylinder  2553 16.5       25.4       -19.0
cylinder  2554 17.5       25.4       -19.0
cylinder  2555 18.5       25.4       -19.0
cylinder  2556 19.5       25.4       -19.0
cylinder  2557 20.0       25.4       -19.0
cylinder  2558 20.5       25.4       -19.0
cylinder  2559 20.978     25.4       -19.0
media     341  1  2551  -2400  -2549
media     342  1  2552  -2551  -2549
media     343  1  2553  -2552  -2549
media     344  1  2554  -2553  -2549
media     345  1  2555  -2554  -2549
media     346  1  2556  -2555  -2549
media     347  1  2557  -2556  -2549
media     348  1  2558  -2557  -2549
media     349  1  2559  -2558  -2549
'
'    Top - Axial  Layer 17   (-19.0  -  -22.0 cm)
cylinder  2561 15.5       25.4       -22.0
cylinder  2562 16.0       25.4       -22.0
cylinder  2563 16.5       25.4       -22.0
cylinder  2564 17.5       25.4       -22.0
cylinder  2565 18.5       25.4       -22.0
```

```
cylinder   2566 19.5        25.4       -22.0
cylinder   2567 20.0        25.4       -22.0
cylinder   2568 20.5        25.4       -22.0
cylinder   2569 20.978       25.4       -22.0
media      331     1    2561   -2400   -2559
media      332     1    2562   -2561   -2559
media      333     1    2563   -2562   -2559
media      334     1    2564   -2563   -2559
media      335     1    2565   -2564   -2559
media      336     1    2566   -2565   -2559
media      337     1    2567   -2566   -2559
media      338     1    2568   -2567   -2559
media      339     1    2569   -2568   -2559
'
'     Top - Axial  Layer 18    (-22.0  -   -25.0 cm)
cylinder   2571 15.5        25.4       -25.0
cylinder   2572 16.0        25.4       -25.0
cylinder   2573 16.5        25.4       -25.0
cylinder   2574 17.5        25.4       -25.0
cylinder   2575 18.5        25.4       -25.0
cylinder   2576 19.5        25.4       -25.0
cylinder   2577 20.0        25.4       -25.0
cylinder   2578 20.5        25.4       -25.0
cylinder   2579 20.978       25.4       -25.0
media      321     1    2571   -2400   -2569
media      322     1    2572   -2571   -2569
media      323     1    2573   -2572   -2569
media      324     1    2574   -2573   -2569
media      325     1    2575   -2574   -2569
media      326     1    2576   -2575   -2569
media      327     1    2577   -2576   -2569
media      328     1    2578   -2577   -2569
media      329     1    2579   -2578   -2569
'
'     Top - Axial  Layer 19    (-25.0  -   -25.4 cm)
cylinder   2581 15.5        25.4       -25.4
cylinder   2582 16.0        25.4       -25.4
cylinder   2583 16.5        25.4       -25.4
cylinder   2584 17.5        25.4       -25.4
cylinder   2585 18.5        25.4       -25.4
cylinder   2586 19.5        25.4       -25.4
cylinder   2587 20.0        25.4       -25.4
cylinder   2588 20.5        25.4       -25.4
cylinder   2589 20.978       25.4       -25.4
media      311     1    2581   -2400   -2579
media      312     1    2582   -2581   -2579
media      313     1    2583   -2582   -2579
media      314     1    2584   -2583   -2579
media      315     1    2585   -2584   -2579
media      316     1    2586   -2585   -2579
media      317     1    2587   -2586   -2579
media      318     1    2588   -2587   -2579
media      319     1    2589   -2588   -2579
cylinder   2590 20.978       54.6       -25.4
media        4     1    2590   -2589
'
boundary 2590
end geom
end data
end
```