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**Spent Fuel Assembly Hardware:
Characterization and 10 CFR 61
Classification for Waste Disposal**

**Volume 3—Calculated Activity Profiles of
Spent Nuclear Fuel Assembly Hardware for
Boiling Water Reactors**

**S. M. Short
A. T. Luksic**

M. E. Schutz

June 1989

**Prepared for the U.S. Department of Energy
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Volume 3

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Hardware for Boiling Water
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ABSTRACT

Consolidation of spent fuel is under active consideration as the U.S. Department of Energy plans to dispose of spent fuel as required by the Nuclear Waste Policy Act of 1982. During consolidation, the fuel pins are removed from an intact fuel assembly and repackaged into a more compact configuration. After repackaging, approximately 30 kg of residual spent fuel assembly hardware per assembly remains that is also radioactive and requires disposal. Understanding the nature of this secondary waste stream is critical to designing a system that will properly handle, package, store, and dispose of the waste.

This report presents a methodology for estimating the radionuclide inventory in irradiated spent fuel hardware. Ratios are developed that allow the use of ORIGEN2 computer code calculations to be applied to regions that are outside the fueled region. The ratios are based on the analysis of samples of irradiated hardware from spent fuel assemblies.

The results of this research are presented in three volumes. In Volume 1, the development of scaling factors that can be used with ORIGEN2 calculations to estimate activation of spent fuel assembly hardware is documented. The results from laboratory analysis of irradiated spent-fuel hardware samples are also presented in Volume 1. In Volumes 2 and 3, the calculated flux profiles of spent nuclear fuel assemblies are presented for pressurized water reactors and boiling water reactors, respectively. The results presented in Volumes 2 and 3 were used to develop the scaling factors documented in Volume 1.

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1.0 INTRODUCTION

When the Department of Energy (DOE) begins accepting spent nuclear fuel for disposal pursuant to the Nuclear Waste Policy Act of 1982, it will not only be accepting the fuel, but also the structural hardware that holds the fuel together. This will include end fittings, grid spacers, guide tubes, etc. In order to accurately assess disposal options for this hardware and their impact on the federal waste management system, it is necessary that the hardware be adequately characterized. This report is part of that characterization study. It focuses on identifying the radionuclides present in the activated metal that makes up the fuel assembly.

The purpose of this report is to document the variability of the neutron flux along a fuel assembly's length as well as the reaction rate (i.e., one-group cross-section) for a number of reactions of interest in BWR hardware. In order to develop this information, a neutronics model was developed for the major fuel assembly type currently available and a one-dimensional neutron transport calculations was performed. The major vendor of BWR fuel assemblies is General Electric. Advanced Nuclear Fuel (formerly EXXON) also manufactures fuel assemblies, but they are essentially clones for the purposes intended herein. The previously named vendor makes several types of fuel designs. For this analysis, a representative model was picked for each evaluation. This was the GE 8 x 8R.

A one-dimensional neutron transport calculation was run for the fuel assembly model using the ANISN computer code. This calculation was done in 27 groups. The resultant group fluxes were then folded with the appropriate cross-sections for the reactions of interest. Section 2 of this report gives a description of the models. Section 3 details the steps taken to perform the neutronics calculations and Section 4 presents the results of the calculations.

2.0 REACTOR DESIGNS

The reactor design presented in this section was the reference design used to make the initial ANISN calculations. The design data was for the most part obtained from General Electric via submittals they made to ORNL under contract. The data was supplied to support the Waste Systems Data Development Program of ORNL.

The reactor design was divided into 47 separate regions. A diagram of just the fuel assembly portion of this design is shown in Figure 2.1. A brief description and the structural composition of each region is given in Table 2.1. Table 2.2 provides the material composition for each of the structures within each region. This table also shows the water density as a function of axial location. Table 2.3 shows the isotopic content of each of the materials in Table 2.2. As the model shows, B_4C cruciforms are modeled in those regions where withdrawn control rods are present.

FIGURE 2.1. Diagram of the General Electric 8 x 8 Fuel Assembly

TABLE 2.1. General Electric Reactor Model for Axial Neutron Flux Distribution Calculation

Region	Description	Axial Location of Outer Boundary (cm)	Composition (v/o)			
			Assembly Hardware	Fuel Rods	Structure	Water
1	Water Reflector and Control Rod Guide	63.50			7.10	92.90
2	Water Reflector and Control Rod Tubes	391.10			17.46	82.54
3	Flow Orifice	401.30			21.96	78.04
4	Core Support Plate	406.40			69.06	30.94
5	Nose Piece and Orifice	426.10	34.68		1.38	63.94
6	Tie Plate and Finger Springs	427.30	56.35		11.08	32.59
7	End Plugs	429.20	27.00	10.00	11.06	51.94
8	15,000 MWd/MTU Fuel @ 0.7359 g/cc Water	445.77	2.00	36.30		61.70
9	15,000 MWd/MTU Fuel @ 0.7359 g/cc Water	462.33	2.00	36.30		61.70
10	15,000 MWd/MTU Fuel @ 0.7220 g/cc Water	475.23	2.00	36.30		61.70
11	15,000 MWd/MTU Fuel @ 0.7220 g/cc Water and Spacer	479.36	8.43	36.30		55.27
12	15,000 MWd/MTU Fuel @ 0.6940 g/cc Water	495.46	2.00	36.30		61.70
13	15,000 MWd/MTU Fuel @ 0.4652 g/cc Water	512.03	2.00	36.30		61.70
14	15,000 MWd/MTU Fuel @ 0.5893 g/cc Water	526.41	2.00	36.30		61.70
15	15,000 MWd/MTU Fuel @ 0.5893 g/cc Water and Spacer	530.54	8.43	36.30		55.27
16	15,000 MWd/MTU Fuel @ 0.5404 g/cc Water	545.16	2.00	36.30		61.70
17	15,000 MWd/MTU Fuel @ 0.4916 g/cc Water	561.72	2.00	36.30		61.70
18	15,000 MWd/MTU Fuel @ 0.4567 g/cc Water	577.59	2.00	36.30		61.70
19	15,000 MWd/MTU Fuel @ 0.4567 g/cc Water and Spacer	581.72	8.43	36.30		55.27
20	15,000 MWd/MTU Fuel @ 0.4287 g/cc Water	594.85	2.00	36.30		61.70
21	15,000 MWd/MTU Fuel @ 0.4008 g/cc Water	611.42	2.00	36.30		61.70

TABLE 2.1. (contd)

Region	Description	Axial Location of Outer Boundary (cm)	Composition (v/o)			
			Assembly Hardware	Fuel Rods	Structure	Water
22	15,000 MWd/MTU Fuel @ 0.3799 g/cc Water	628.77	2.00	36.30		61.70
23	15,000 MWd/MTU Fuel @ 0.3799 g/cc Water and Spacer	632.90	8.43	36.30		55.27
24	15,000 MWd/MTU Fuel @ 0.3589 g/cc Water	644.55	2.00	36.30		61.70
25	15,000 MWd/MTU Fuel @ 0.3449 g/cc Water	661.11	2.00	36.30		61.70
26	15,000 MWd/MTU Fuel @ 0.3310 g/cc Water	679.95	2.00	36.30		61.70
27	15,000 MWd/MTU Fuel @ 0.3310 g/cc Water and Spacer	684.08	8.43	36.30		55.27
28	15,000 MWd/MTU Fuel @ 0.3240 g/cc Water	694.24	2.00	36.30		61.70
29	15,000 MWd/MTU Fuel @ 0.3100 g/cc Water	710.81	2.00	36.30		61.70
30	15,000 MWd/MTU Fuel @ 0.3031 g/cc Water	731.13	2.00	36.30		61.70
31	15,000 MWd/MTU Fuel @ 0.3031 g/cc Water and Spacer	735.26	8.43	36.30		55.27
32	15,000 MWd/MTU Fuel @ 0.2961 g/cc Water	743.94	2.00	36.30		61.70
33	15,000 MWd/MTU Fuel @ 0.2891 g/cc Water	760.50	2.00	36.30		61.70
34	15,000 MWd/MTU Fuel @ 0.2891 g/cc Water	777.07	2.00	36.30		61.70
35	15,000 MWd/MTU Fuel @ 0.2821 g/cc Water	782.31	2.00	36.30		61.70
36	15,000 MWd/MTU Fuel @ 0.2821 g/cc Water and Spacer	786.44	8.43	36.30		55.27
37	15,000 MWd/MTU Fuel @ 0.2821 g/cc Water	793.64	2.00	36.30		61.70
38	15,000 MWd/MTU Fuel @ 0.2751 g/cc Water	810.20	2.00	36.30		61.70
39	Gas Plenum and Plenum Springs	834.30	2.00	36.30		61.70
40	End Plugs	835.00	43.90			56.10
41	End Pins and Springs	837.10	21.91			78.09
42	Tie Plate	839.30	51.90			48.10
43	Fuel guide	850.60	6.20		5.50	88.30

TABLE 2.1. (contd)

Region	Description	Axial Location of Outer Boundary (cm)	Composition (v/o)			
			Assembly Hardware	Fuel Rods	Structure	Water
44	Handle	860.90	1.40			98.60
45	Steam Dome	902.90				100.00
46	Shroud Head Plate	908.00			93.30	6.70
47	Water Reflector and Steam Separator Risers	1134.10			4.00	96.00

TABLE 2.2. Material Compositions for the General Electric Reactor Model

Region	Material Composition (v/o)			Water Density (g/cc)
	Assembly Hardware	Fuel Rods	Structure	
1			7.10% SS-304	0.8600
2			16.08% SS-304 1.38% B ₄ C	0.8600
3			20.58% SS-304 1.38% B ₄ C	0.8600
4			67.68% SS-304 1.38% B ₄ C	0.8600
5	34.68% SS-304		1.38% B ₄ C	0.8600
6	35.00% SS-304 20.00% Zr-2 1.35% INC-718		9.68% SS-304 1.38% B ₄ C	0.8600
7	27.00% Zr-2	10.00% Zr-2	9.68% SS-304 1.38% B ₄ C	0.8600
8	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.7359
9	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.7359
10	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.7220
11	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.7220
12	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.6940
13	2.00 Zr-2	10.00% Zr-2 26.30% UO ₂		0.6452
14	2.00 Zr-2	10.00% Zr-2 26.30% UO ₂		0.5893
15	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.5893
16	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.5404

TABLE 2.2 (contd)

Region	Material Composition (v/o)			Water Density (g/cc)
	Assembly Hardware	Fuel Rods	Structure	
17	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.4916
18	2.00 Zr-2	10.00% Zr-2 26.30% UO ₂		0.4567
19	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.4567
20	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.4287
21	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.4008
22	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3799
23	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.3799
24	2.00% Zr-2	10.00 Zr-2 26.30% UO ₂		0.3589
25	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3449
26	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3310
27	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.3310
28	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3240
29	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3100
30	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.3031
31	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.3031

TABLE 2.2 (contd)

Region	Material Composition (v/o)			Water Density (g/cc)
	Assembly Hardware	Fuel Rods	Structure	
32	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2961
33	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2891
34	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2891
35	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2821
36	7.73% Zr-2 0.70% INC-718	10.00% Zr-2 26.30% UO ₂		0.2821
37	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2821
38	2.00% Zr-2	10.00% Zr-2 26.30% UO ₂		0.2751
39	2.00% Zr-2	10.00% Zr-2 5.91% INC-750 20.39% Void		0.2751
40	37.00% Zr-2 6.90% INC-750			0.2751
41	16.00% Zr-2 5.91% INC-750			0.2751
42	35.90% SS-304 16.00% Zr-2			0.2751
43	1.40% SS-304 4.80% Zr-2		5.50% SS-304	0.2751
44	1.40% SS-304			0.2751
45				0.2751
46			93.30% SS-304	0.2751
47			4.00% SS-304	0.6300

TABLE 2.3. Isotopic Content of Materials Used in the General Electric Reactor Model

Material	Isotope	Content (%)		Content (atoms/b-cm)
SS-304	Fe	67.39		5.762×10^{-2}
	Cr	19.00		1.745×10^{-2}
	Ni	10.00		8.134×10^{-3}
	Si	2.00		3.401×10^{-3}
	Mn	1.50		1.304×10^{-3}
Zr-2	Zr	98.25		4.292×10^{-2}
	Sn	1.45		4.819×10^{-4}
	Fe	0.21		1.483×10^{-4}
	Cr	0.10		7.586×10^{-5}
	Ni	0.06		4.031×10^{-5}
INC-718	Ni	52.50		4.432×10^{-2}
	Cr	19.00		1.811×10^{-2}
	Fe	17.92		1.590×10^{-2}
	Nb	5.13		2.737×10^{-3}
	Mo	3.05		1.576×10^{-3}
	Co	1.00		8.410×10^{-4}
	Ti	0.90		9.312×10^{-4}
	Al	0.50		9.185×10^{-4}
INC-750	Ni	71.35		6.038×10^{-2}
	Cr	15.50		1.481×10^{-2}
	Fe	7.00		6.227×10^{-3}
	Ti	2.50		2.593×10^{-3}
	Mn	1.00		9.043×10^{-4}
	Co	1.00		8.430×10^{-4}
	Nb	0.95		5.080×10^{-4}
	Al	0.70		1.289×10^{-3}
B ₄ C	B-10	19.60	80.00	1.628×10^{-2}
	B-11	80.40		6.677×10^{-2}
	C-12	98.89	20.00	2.053×10^{-2}
Water (1.0 g/cc)	H			6.686×10^{-2}
	O			3.343×10^{-2}

TABLE 2.3. (contd)

<u>Material</u>	<u>Isotope</u>	<u>Content (%)</u>	<u>Content (atoms/b-cm)</u>
15,000 MWd/MTU UO ₂ (2.4% U-235 initial enrichment)	U-234		1.313×10^{-8}
	U-235		3.062×10^{-4}
	U-236		5.721×10^{-5}
	U-238		2.527×10^{-2}
	Pu-239		1.113×10^{-4}
	Pu-240		3.157×10^{-5}
	Pu-241		1.611×10^{-5}
	Pu-242		2.767×10^{-6}
	B-10 (fission product)		3.985×10^{-6}
	0		4.620×10^{-2}

3.0 APPROACH

A flow diagram displaying the sequence in which the various neutronics computer codes were utilized is given in Figure 3.1. The methodology was one of generating the necessary cross sections first (DASQHE, NITAWL, and XSDRNPM) followed by the calculations necessary to generate the required reaction rates (GIP and ANISN). The input decks used in each step shown in the flow diagram are given in Appendix A.

The stepwise process used to arrive at the reaction rates of interest started first with making DASQHE runs at several different water densities to obtain Dancoff correction factors applicable at different axial locations within the core of the General Electric reactor. Table 3.1 shows the water densities and corresponding Dancoff correction factors utilized within the model. The specific inputs for the DASQHE runs are given in Tables A.1 through A.23.

The results of the DASQHE runs were used to make a NITAWL run to correct isotopes in the cross section library (CMLIB) for resonance that would later be used to make pin cell calculations. CMLIB is a 27-group cross section library generated from a 218 neutron group master cross section library that was itself generated from the ENDF/B-IV data base. CMLIB is commonly used for criticality safety analyses. The isotopes in this library are shown in Table 3.2. Table 3.3 presents the group structure of CMLIB. The input data for the NITAWL run is given in Table A.24. An additional NITAWL run was made to generate a library of control cell isotope cross sections. This input deck is shown in Table A.25.

The NITAWL generated libraries were used to make one control cell and 23 pin cell (one for each water density) XSDRNPM runs to obtain cell weighted cross sections. These cell calculations were made for a General Electric 8 x 8 fuel assembly. Figure 3.2 is a diagram of the pin cell and associated dimensions used to make the pin cell calculations. A diagram of the control cell and associated dimensions is shown in Figure 3.3. Tables A.26 through A.48 are the input data for the three pin cell calculations while Table A.49 is the input deck for the control cell calculation. Finally, 23 additional NITAWL

runs were required to combine the 24 cell weighted cross section libraries into one ANISN formatted 27-group P3 library. These input decks are given in Tables A.50 through A.72. The cross sections contained in the master library are given in Table 3.4. This master cross section library was the library used for the General electric BWR reactor design.

Given the large number of materials present in the master library, a GIP run was made to produce one set of macroscopic cross sections for each region in the reactor model. Table A.73 is the input deck for the GIP run. The GIP generated cross section libraries were then used to make an ANISN run. An input deck for this run is given in Table A.74.

Code References

Engle, Jr., W. W. 1973. A Users Manual for ANISN: A One-Dimensional Discrete Ordinates Transport Code with Anisotropic Scattering. K-1693, June.

Ford, III, W. E. 1976. A 218-Group Neutron Cross-Section Library in the AMPX Master Interface Format for Criticality Safety Studies. ORNL/CSD/TM-4, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

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Roades, W. A. and M. B. Emmett. 1982. "DOS: The Discrete Ordinates System." ORNL/TM-8362, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Traver, T. M. 1969. User's Manual for DASQHE. BNWL-CC-2274, Pacific Northwest Laboratory, Richland, Washington.

FIGURE 3.1. Flow Diagram of Computer Code Running Sequence

TABLE 3.1. Water Densities and Corresponding Dancoff Correction Factors Used in the Model

<u>Water Density (g/cc)</u>	<u>Dancoff Factor</u>
0.8600	0.1771330
0.7359	0.2155057
0.7220	0.2204190
0.6940	0.2307555
0.6452	0.2502805
0.5893	0.2753109
0.5404	0.2999179
0.4916	0.3274137
0.4567	0.3491478
0.4287	0.3679974
0.4008	0.3881729
0.3799	0.4042742
0.3589	0.4213872
0.3449	0.4333550
0.3310	0.4457035
0.3240	0.4521067
0.3100	0.4653023
0.3031	0.4720045
0.2961	0.4789463
0.2891	0.4860277
0.2821	0.4932635
0.2751	0.5006428
0.6300	0.2567891

TABLE 3.2 Isotopes Available in CMLIB (A 27-Group Cross Section Library)

Nuclide	ENDF/B MAT No.(a)	Resolved Resonance Data	Weight Function(b)	Master Library ID No.	MT Numbers for 1-d Processes In Data Set	MT Numbers for 2-d Processes in Data Set(c)	Remarks
H	1269	No	A	1269	1,2,27,101,102,1099	2,1007	MAT 1002 H+O bound thermal
D	1120	No	A	112003	1,2,16,27,101,102,1099	2,16,1007	MAT 1004 D ₂ O bound thermal
He-4	1270	No	A	1270	1,2,1099		
Li-6	1271	No	A	127103	1,2,4,24,27,101-103,107,1099	2,24,52,91,1007	
Li-7	1272	No	A	127203	1,2,4,16,24,27,101,102,104,1099	2,16,24,51,91,1007	
Be-9	1289	No	B	1289	1,2,16,27,101-105,107,1099	2,6-9,44-49,1007	
B-10	1273	No	A	127303	1,2,4,27,101,103,104,107,113,1099	2,51,85,1007	
B-11	1160	No	A	116003	1,2,4,16,27,101-103,105,107,1099	2,16,51-53,91,1007	
C-12	1274	No	A	127403	1,2,4,27,101,102,107,1099	2,51,91,1007	
N-14	1275	No	A	1275	1,2,4,16,27,101-105,107,108,1099	2,16,51-82,1007	
O-16	1276	No	A	1276	1,2,4,27,101-104,107,1099	2,51-89,1007	
F	1277	No	A	1277	1,2,4,16,22,27,28,101-105,107,1099	2,16,22,28,51-71,91,1007	
Na-23	1156	Yes	B	115602	1,2,4,16,27,101-103,107,1021,1099	2,16,51-68,91,1007	
Mg	1280	No	A	128003	1,2,4,16,22,27,28,101-103,107,1099	2,16,22-28,51-59,1007	
Al-27	1193	No	A	1193	1,2,4,16,27,101-105,107,1099	2,16,51-90,1007	
Si	1194	No	A	119403	1,2,4,16,22,27,28,101-104,107,1099	2,16,22,28,51-72,91,1007	
P-31	7019 ^(d)	No	A	701903	1,2,4,16,27,28,101-103,107,1099	2,16,28,91,1007	
S-32	7020 ^(d)	No	A	702003	1,2,4,16,27,28,101-103,105,107,1099	2,16,28,91,1007	
Cl	1149	No	A	1149	1,2,4,16,22,27,28,101-103,107,1099	2,16,22,28,51-63,91,1007	
K	1150	No	A	1150	1,2,4,16,22,27,28,101-103,107,1099	2,16,22,28,51-67,91,1007	
Ca	1195	No	A	119503	1,2,4,16,22,27,28,101-108,111,112,1099	2,16,22,28,51,73,91,1007	
Ti	1286	No	A	1286	1,2,4,16,27,101-103,107,1099	2,16,51,91,1007	
V	1196	No	A	119603	1,2,4,16,22,27,28,101-105,107,1099	2,16,22,28,51-54,91,1007	
Cr	1191	No	B	119102	1,2,4,16,22,27,28,101-107,1099	2,16,22,28,51-91,1007	
Cr	1191	No	D	1191104	1,2,4,16,22,27,28,101-107,1099	2,16,22,28,51-91,1007	
Cr	1191	No	C	1191101	1,2,4,16,22,27,28,101-107,1099	2,16,22,28,51-91,1007	
Mn-55	1197	Yes	B	119702	1,2,4,16,17,22,27,28,101-104,106,107,1021,1099	2,16,17,22,28,51-55,91,1007	
Fe	1192	No	B	119202	1,2,4,16,22,27-28,101-107,1099	2,16,22,28,51-76,91,1007	
Fe	1192	No	D	1192104	1,2,4,16,22,27-28,101-107,1099	2,16,22,28,51-76,91	
Fe	1192	No	C	1192101	1,2,4,16,22,27-28,101-107,1099	2,16,22,28,51-76,91,1007	
Co-59	1199	Yes	B	1199	1,2,4,16,27,101-105,107,1021,1099	2,16,51-59,91,1007	
Ni	1190	No	B	119002	1,2,4,16,27,28,101-103,107,1099	2,16,28,51-65,91,1007	
Ni	1190	No	D	1190104	1,2,4,16,27,28,101-103,107,1099	2,16,28,51-65,91,1007	
Ni	1190	No	C	1190101	1,2,4,16,27,28,101-103,107,1099	2,16,28,51-65,91,1007	
Cu	1295	No	B	129502	1,2,4,16,17,22,27,28,101-104,106,107,1099	2,16,17,22,28,51-61,91,1007	
Zr	7141 ^(d)	No	B	714102	1,2,4,16,17,27,101,103,1099	2,16,17,51-58,91,1007	
ZIRC-2	1286	No	B	128402	1,2,4,16,27,101-103,107,1099	2,16,51-56,91,1007	
Nb-93	1184	Yes	B	1189	1,2,4,16,17,22,27,101-103,107,1021,1099	2,16,22,27,51-62,91,1007	
Mo	1287	No	B	128702	1,2,4,16,17,27,101,102,1099	2,16,17,91,1007	
Ag-107	1138	Yes	B	113802	1,2,4,16,27,101-105,107,1021,1099	2,16,51-56,91,1007	
Ag-109	1139	Yes	B	113902	1,2,4,16,27,101-103,107,1021,1099	2,16,51-55,91,1007	
Cd	1281	No	A	128103	1,2,4,16,27,101-103,107,1099	2,16,51-54,91,1007	
Sn	7039 ^(d)	No	A	703903	1,2,4,16,17,27,101,102,1099	2,16,17,91,1007	
Ba-138	7040 ^(d)	No	A	704003	1,2,4,16,17,27,101-103,107,1099	2,16,17,91,1007	
Cd	1030	No	B	103002	1,2,4,16,17,27,101-102,1099	2,16,17,91,1007	
Dy-164	1031	Yes	B	103102	1,2,4,16,17,27,101-103,107,1021,1099	2,16,17,51-62,91,1007	
Lu-175	1032	Yes	B	103202	1,2,4,16,17,27,101-103,107,1021,1099	2,16,17,51-58,91,1007	
Lu-176	1033	Yes	B	103302	1,2,4,16,17,27,101-103,107,1021,1099	2,16,17,51-58,91,1007	
Hf	1034	No	B	103402	1,2,4,16,27,101-103,1099	2,1007	
Ta-181	1285	No	B	128502	1,2,4,16,17,27,101,102,103,1099	2,16,17,51-60,91,1007	
W-182	1128	Yes	B	1128	1,2,4,16,17,27,28,101,102,103,107,1021,1099	2,16,17,28,51-59,91,1007	
W-183	1129	Yes	B	1129	1,2,4,16,17,27,28,101,102,103,107,1021,1099	2,16,17,28,51-59,91,1007	
W-184	1130	Yes	B	1130	1,2,4,16,17,27,28,101,102,103,107,1021,1099	2,16,17,28,51-59,91,1007	
W-186	1131	Yes	B	1131	1,2,4,16,17,27,28,101,102,103,107,1021,1099	2,16,17,28,51-59,91,1007	
Re-185	1083	Yes	B	1083	1,2,4,16,17,27,101,102,1021,1099	2,16,17,51-59,91,1007	

TABLE 3.2. (contd)

Nuclide	ENDF/B MAT No.(a)	Resolved Resonance Data	Weight Function(b)	Master Library ID No.	MT Numbers for 1-d Processes in Data Set	MT Numbers for 2-d Processes in Data Set(c)	Remarks
Re-187	1084	Yes	B	1084	1,2,4,16,17,27,101,102,1021,1099	2,16,17,51-61,91,1007	
Au-197	1283	Yes	B	128302	1,2,4,16,17,26,27,101-103,107,1021,1099	2,16,17,51-64,91,1007	
Pb	1288	No	A	128803	1,2,4,16,17,27,101,102,1099	2,16,17,51-85,91,1007	
Th-232	1296	Yes	B	129602	1,2,4,16,17,18,27,101,102,452,1021,1099,1018	2,16,17,51-58,91,1007	
U-233	1260	Yes	B	126002	1,2,4,16-18,27,101,102,452,1021,1022,1099,1018	2,16,17,51-57,91,1007	
U-234	1043	Yes	B	104302	1,2,4,16-18,27,101,102,452,1021,1099,1018	2,16,51-56,91,1007	
U-235	1261	Yes	B	1261	1,2,4,16-18,27,101-102,452,1018,1021,1022,1099	2,16,17,51-66,1007	
U-236	1163	Yes	B	116302	1,2,4,16-18,27,101,102,452,1021,1099,1018	2,16,51-56,91,1007	
U-238	1262	Yes	B	1262	1,2,4,16-18,27,101,102,452,1018,1021,1022,1099	2,16,17,51-76,91,1007	
Np-237	1263	Yes	B	126302	1,2,4,16-18,27,101,102,452,1021,1022,1099,1018	2,16,17,51-61,91,1007	
Pu-238	1050	Yes	B	1050	1,2,4,16-18,27,101,102,452,1021,1022,1099,1018	2,16,17,51-59,91,1007	
Pu-239	1264	Yes	B	126402	1,2,4,16-18,27,37,101,102,452,1018,1021,1022,1099	2,16,17,51-76,91,1007	
Pu-240	1265	Yes	B	126502	1,2,4,16-18,27,101,102,452,1018,1021,1022,1099	2,16,17,51-62,91,1007	
Pu-241	1266	Yes	B	126602	1,2,4,16-18,27,101,102,452,1018,1021,1022,1099	2,16,17,51-65,91,1007	
Pu-242	1161	Yes	B	1161	1,2,4,16-18,27,101,102,452,1018,1021,1099	2,16,17,51-60,91,1007	
Am-241	1056	Yes	B	1056	1,2,4,18,27,101,102,452,1018,1021,1022,1099	2,91,1007	
Cm-244	1162	Yes	B	116202	1,2,4,16-18,27,101,102,452,1021,1022,1099,1018	2,16,17,51-60,91,1007	

(a) All neutron data from ENDF/B-IV unless otherwise noted.

(b) See Table 4 for energy range of weight functions. The following code is used to identify the weight functions:

Code	Weight Function
A	Fission-1/E _{0T} -Maxwellian
B	Fission-1/E-Maxwellian
C	1/E _{0T} -inconel-Maxwellian
D	1/E _{0T} stainless steel 304-Maxwellian

(c) See Table 3 for correspondence between MT numbers and reaction types.

(d) Data from the ENDL library.

TABLE 3.3. CMLIB Group Structure

Group Number	Energy Boundaries (eV)	Lethargy Boundaries	Velocities (cm/s)
1	2.00000+007	-6.93147-001	4.65844+009
2	6.43400+006	4.40989-001	2.89910+009
3	3.00000+006	1.20397+000	2.12293+009
4	1.85000+006	1.68740+000	1.75464+009
5	1.40000+006	1.96611+000	1.46540+009
6	9.00000+005	2.40795+000	1.07137+009
7	4.00000+005	3.21888+000	6.18554+008
8	1.00000+005	4.60517+000	2.80850+008
9	1.70000+004	6.37713+000	1.16884+008
10	3.00000+003	8.11173+000	4.95716+007
11	5.50000+002	9.80818+000	2.11813+007
12	1.00000+002	1.15129+001	1.02363+007
13	3.00000+001	1.27169+001	5.75629+006
14	1.00000+001	1.38155+001	3.25040+006
15	3.05000+000	1.50030+001	2.10829+006
16	1.77000+000	1.55471+001	1.70350+006
17	1.30000+000	1.58557+001	1.52271+006
18	1.13000+000	1.59959+001	1.42604+006
19	1.00000+000	1.61181+001	1.30808+006
20	8.00000-001	1.63412+001	1.04028+006
21	4.00000-001	1.70344+001	8.30516+005
22	3.25000-001	1.72420+001	7.19248+005
23	2.25000-001	1.76098+001	5.35683+005
24	1.00000-001	1.84207+001	3.67794+005
25	5.00000-002	1.91138+001	2.72198+005
26	3.00000-002	1.96247+001	1.82030+005
27	1.00000-002	2.07233+001	2.45959+004
28	1.00000-005	2.76310+001

$$r_1 = 0.52324 \text{ cm}$$

$$r_2 = 0.61468 \text{ cm}$$

$$r_3 = 0.91858 \text{ cm}$$

FIGURE 3.2. Diagram and Dimensions Used for the Pin Cell Calculations

$$r_1 = 5.7192 \text{ cm}$$

$$r_2 = 16.5058 \text{ cm}$$

$$r_3 = 17.1965 \text{ cm}$$

FIGURE 3.3. Diagram and Dimensions Used for the Control Cell Calculations

TABLE 3.4. Isotopes Present in the Master Cross Section Library

AN ANISN BINARY LIBRARY HAS BEEN MADE ON LOGICAL 20
THE LIBRARY CONTENTS ARE

NOG	ITL	TCT	ID	TITLE
27	40	0	1	P0 O-16 1276 218 GP 040375(5)
27	40	0	2	P1 O-16 1276 218 GP 040375(5)
27	40	0	3	P2 O-16 1276 218 GP 040375(5)
27	40	0	4	P3 O-16 1276 218 GP 040375(5)
27	40	0	5	P0 H 1269 F, 1002 T 218 GP 032475(2)
27	40	0	6	P1 H 1269 F, 1002 T 218 GP 032475(2)
27	40	0	7	P2 H 1269 F, 1002 T 218 GP 032475(2)
27	40	0	8	P3 H 1269 F, 1002 T 218 GP 032475(2)
27	40	0	9	P0 ZR(NAT) 7141 21 NGP WT FIS(0.1T020)-1/E-MAX
27	40	0	10	P1 ZR(NAT) 7141 21 NGP WT FIS(0.1T020)-1/E-MAX
27	40	0	11	P2 ZR(NAT) 7141 21 NGP WT FIS(0.1T020)-1/E-MAX
27	40	0	12	P3 ZR(NAT) 7141 21 NGP WT FIS(0.1T020)-1/E-MAX
27	40	0	13	P0 CA 1195 218 GP 1/E*SIGT 040375(5)
27	40	0	14	P1 CA 1195 218 GP 1/E*SIGT 040375(5)
27	40	0	15	P2 CA 1195 218 GP 1/E*SIGT 040375(5)
27	40	0	16	P3 CA 1195 218 GP 1/E*SIGT 040375(5)
27	40	0	17	P0 W-182 1128 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	18	P1 W-182 1128 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	19	P2 W-182 1128 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	20	P3 W-182 1128 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	21	P0 CL 1149 218 GP WT 1/EST 042375 P3 293K
27	40	0	22	P1 CL 1149 218 GP WT 1/EST 042375 P3 293K
27	40	0	23	P2 CL 1149 218 GP WT 1/EST 042375 P3 293K
27	40	0	24	P3 CL 1149 218 GP WT 1/EST 042375 P3 293K
27	40	0	25	P0 TI 1286 218 GP WT 1/EST 042375 P3 293K
27	40	0	26	P1 TI 1286 218 GP WT 1/EST 042375 P3 293K
27	40	0	27	P2 TI 1286 218 GP WT 1/EST 042375 P3 293K
27	40	0	28	P3 TI 1286 218 GP WT 1/EST 042375 P3 293K
27	40	0	29	P0 CO-59 1199 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	30	P1 CO-59 1199 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	31	P2 CO-59 1199 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	32	P3 CO-59 1199 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	33	P0 NB-93 1189 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	34	P1 NB-93 1189 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	35	P2 NB-93 1189 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	36	P3 NB-93 1189 218 GP WT F-1/E-M 042375 P3 293K
27	40	0	37	P0 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	40	0	38	P1 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	40	0	39	P2 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	40	0	40	P3 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	40	0	41	P0 B-10 1273 218NGP 042375 P-3 293K
27	40	0	42	P1 B-10 1273 218NGP 042375 P-3 293K
27	40	0	43	P2 B-10 1273 218NGP 042375 P-3 293K
27	40	0	44	P3 B-10 1273 218NGP 042375 P-3 293K
27	40	0	45	P0 MO 1287 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	46	P1 MO 1287 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	47	P2 MO 1287 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	48	P3 MO 1287 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	49	P0 FE 1192 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	50	P1 FE 1192 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	51	P2 FE 1192 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	52	P3 FE 1192 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	53	P0 NI 1190 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	54	P1 NI 1190 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	55	P2 NI 1190 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	56	P3 NI 1190 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	57	P0 CR 1191 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	58	P1 CR 1191 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	59	P2 CR 1191 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	60	P3 CR 1191 218NGP WT 1/E P-3 293K SIGP=5+4 RE(0
27	40	0	61	P0 MN-55 1197 218NGP WT 1/E P-3 293K SIGP=5+4 R
27	40	0	62	P1 MN-55 1197 218NGP WT 1/E P-3 293K SIGP=5+4 R
27	40	0	63	P2 MN-55 1197 218NGP WT 1/E P-3 293K SIGP=5+4 R
27	40	0	64	P3 MN-55 1197 218NGP WT 1/E P-3 293K SIGP=5+4 R
27	40	0	65	P0 N-14 1275 218 GP 040375(5)
27	40	0	66	P1 N-14 1275 218 GP 040375(5)
27	40	0	67	P2 N-14 1275 218 GP 040375(5)
27	40	0	68	P3 N-14 1275 218 GP 040375(5)
27	40	0	69	P0 AL-27 1193 218 GP 040375(5)
27	40	0	70	P1 AL-27 1193 218 GP 040375(5)
27	40	0	71	P2 AL-27 1193 218 GP 040375(5)
27	40	0	72	P3 AL-27 1193 218 GP 040375(5)

TABLE 3.4. contd

27	40	0	73	P0	O-16	1276	218	GP	040375(5)	
27	40	0	74	P1	O-16	1276	218	GP	040375(5)	
27	40	0	75	P2	O-16	1276	218	GP	040375(5)	
27	40	0	76	P3	O-16	1276	218	GP	040375(5)	
27	40	0	77	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	78	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	79	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	80	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	81	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	82	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	83	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	84	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	85	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	86	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	87	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	88	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	89	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	90	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	91	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	92	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	93	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	94	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	95	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	96	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	97	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	98	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	99	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	100	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	101	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	102	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	103	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	104	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	105	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	106	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	107	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	108	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	109	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	110	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	111	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	112	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	113	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	114	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	115	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	116	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	117	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	118	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	119	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	120	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	121	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	122	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	123	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	124	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	125	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	126	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	127	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	128	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	129	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	130	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	131	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	132	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	133	P0	0-16	1276	218	GP	040375(5)		40	27
27	134	P1	0-16	1276	218	GP	040375(5)		40	27
27	135	P2	0-16	1276	218	GP	040375(5)		40	27
27	136	P3	0-16	1276	218	GP	040375(5)		40	27
27	137	P0	H	1269	F	1002	T 218 GP 032475(2)		40	27
27	138	P1	H	1269	F	1002	T 218 GP 032475(2)		40	27
27	139	P2	H	1269	F	1002	T 218 GP 032475(2)		40	27
27	140	P3	H	1269	F	1002	T 218 GP 032475(2)		40	27
27	141	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)	-1/E-MAX	40	27
27	142	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)	-1/E-MAX	40	27
27	143	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)	-1/E-MAX	40	27
27	144	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)	-1/E-MAX	40	27
27	145	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)		40	27
27	146	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)		40	27
27	147	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)		40	27
27	148	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)		40	27
27	149	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)		40	27
27	150	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)		40	27
27	151	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)		40	27
27	152	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)		40	27
27	153	P0	PU-242	1161	218	GP	WT F-1/E-M 042375	P3 293K	40	27
27	154	P1	PU-242	1161	218	GP	WT F-1/E-M 042375	P3 293K	40	27
27	155	P2	PU-242	1161	218	GP	WT F-1/E-M 042375	P3 293K	40	27
27	156	P3	PU-242	1161	218	GP	WT F-1/E-M 042375	P3 293K	40	27
27	157	P0	U-236	1163	218	GP	F-1/E-M 040375(5)		40	27
27	158	P1	U-236	1163	218	GP	F-1/E-M 040375(5)		40	27
27	159	P2	U-236	1163	218	GP	F-1/E-M 040375(5)		40	27
27	160	P3	U-236	1163	218	GP	F-1/E-M 040375(5)		40	27
27	161	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4	293K R	40	27
27	162	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4	293K R	40	27
27	163	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4	293K R	40	27
27	164	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4	293K R	40	27
27	165	P0	SN	7039	WT	1/EST	218NGP P-3	293K RE(042375)	40	27
27	166	P1	SN	7039	WT	1/EST	218NGP P-3	293K RE(042375)	40	27
27	167	P2	SN	7039	WT	1/EST	218NGP P-3	293K RE(042375)	40	27
27	168	P3	SN	7039	WT	1/EST	218NGP P-3	293K RE(042375)	40	27
27	169	P0	FE	1192	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	170	P1	FE	1192	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	171	P2	FE	1192	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	172	P3	FE	1192	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	173	P0	NI	1190	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	174	P1	NI	1190	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	175	P2	NI	1190	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	176	P3	NI	1190	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	177	P0	CR	1191	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	178	P1	CR	1191	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	179	P2	CR	1191	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	180	P3	CR	1191	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	181	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	182	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	183	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	184	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	185	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	186	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	187	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	188	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	189	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	190	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	191	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27
27	192	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4	293K RE(0)	40	27

TABLE 3.4. contd

27	40	0	193	P0	O-16	1276	218	GP	040375(5)
27	40	0	194	P1	O-16	1276	218	GP	040375(5)
27	40	0	195	P2	O-16	1276	218	GP	040375(5)
27	40	0	196	P3	O-16	1276	218	GP	040375(5)
27	40	0	197	P0	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	198	P1	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	199	P2	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	200	P3	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	201	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	202	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	203	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	204	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	205	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	206	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	207	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	208	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	209	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	210	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	211	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	212	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	213	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	214	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	215	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	216	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	217	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	218	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	219	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	220	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	221	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	222	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	223	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	224	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	225	P0	SN	7039	WT	1/EST	218NGP P-3 293K RE(042375)
27	40	0	226	P1	SN	7039	WT	1/EST	218NGP P-3 293K RE(042375)
27	40	0	227	P2	SN	7039	WT	1/EST	218NGP P-3 293K RE(042375)
27	40	0	228	P3	SN	7039	WT	1/EST	218NGP P-3 293K RE(042375)
27	40	0	229	P0	FE	1192	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	230	P1	FE	1192	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	231	P2	FE	1192	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	232	P3	FE	1192	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	233	P0	NI	1190	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	234	P1	NI	1190	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	235	P2	NI	1190	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	236	P3	NI	1190	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	237	P0	CR	1191	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	238	P1	CR	1191	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	239	P2	CR	1191	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	240	P3	CR	1191	218NGP	WT 1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	241	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	242	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	243	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	244	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	245	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	246	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	247	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	248	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	249	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	250	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	251	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	252	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	253	P0	O-16	1276	218	GP	040375(5)	
27	40	0	254	P1	O-16	1276	218	GP	040375(5)	
27	40	0	255	P2	O-16	1276	218	GP	040375(5)	
27	40	0	256	P3	O-16	1276	218	GP	040375(5)	
27	40	0	257	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	258	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	259	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	260	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	261	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	262	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	263	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	264	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	265	P0	U-235	1261		SIGP=5+4	T=293	218GP 101475(3)
27	40	0	266	P1	U-235	1261		SIGP=5+4	T=293	218GP 101475(3)
27	40	0	267	P2	U-235	1261		SIGP=5+4	T=293	218GP 101475(3)
27	40	0	268	P3	U-235	1261		SIGP=5+4	T=293	218GP 101475(3)
27	40	0	269	P0	U-238	1262		SIGP=5+4	T=293	218GP 092975(5)
27	40	0	270	P1	U-238	1262		SIGP=5+4	T=293	218GP 092975(5)
27	40	0	271	P2	U-238	1262		SIGP=5+4	T=293	218GP 092975(5)
27	40	0	272	P3	U-238	1262		SIGP=5+4	T=293	218GP 092975(5)
27	40	0	273	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	274	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	275	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	276	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	277	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	278	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	279	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	280	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	281	P0	U-234	1043		218NGP	WT	1/E P-3 SIGP=5+4 293K R
27	40	0	282	P1	U-234	1043		218NGP	WT	1/E P-3 SIGP=5+4 293K R
27	40	0	283	P2	U-234	1043		218NGP	WT	1/E P-3 SIGP=5+4 293K R
27	40	0	284	P3	U-234	1043		218NGP	WT	1/E P-3 SIGP=5+4 293K R
27	40	0	285	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	286	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	287	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	288	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	289	P0	FE	1192		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	290	P1	FE	1192		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	291	P2	FE	1192		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	292	P3	FE	1192		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	293	P0	NI	1190		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	294	P1	NI	1190		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	295	P2	NI	1190		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	296	P3	NI	1190		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	297	P0	CR	1191		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	298	P1	CR	1191		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	299	P2	CR	1191		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	300	P3	CR	1191		218NGP	WT	1/E P-3 293K SIGP=5+4 RE(0
27	40	0	301	P0	PU-239	1264		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	302	P1	PU-239	1264		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	303	P2	PU-239	1264		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	304	P3	PU-239	1264		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	305	P0	PU-240	1265		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	306	P1	PU-240	1265		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	307	P2	PU-240	1265		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	308	P3	PU-240	1265		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	309	P0	PU-241	1266		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	310	P1	PU-241	1266		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	311	P2	PU-241	1266		218NGP	WT	1/E P-3 SIGP=5+4 293K
27	40	0	312	P3	PU-241	1266		218NGP	WT	1/E P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	313	P0	O-16	1276	218	GP	040375(5)	
27	40	0	314	P1	O-16	1276	218	GP	040375(5)	
27	40	0	315	P2	O-16	1276	218	GP	040375(5)	
27	40	0	316	P3	O-16	1276	218	GP	040375(5)	
27	40	0	317	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	318	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	319	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	320	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	321	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	322	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	323	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	324	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	325	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	326	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	327	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	328	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	329	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	330	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	331	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	332	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	333	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	334	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	335	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	336	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	337	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	338	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	339	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	340	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	341	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	342	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	343	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	344	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	345	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	346	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	347	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	348	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	349	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	350	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	351	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	352	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	353	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	354	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	355	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	356	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	357	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	358	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	359	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	360	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	361	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	362	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	363	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	364	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	365	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	366	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	367	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	368	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	369	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	370	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	371	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	372	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

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27	40	0	373	P0	0-16	1276	218	GP	040375(5)	
27	40	0	374	P1	0-16	1276	218	GP	040375(5)	
27	40	0	375	P2	0-16	1276	218	GP	040375(5)	
27	40	0	376	P3	0-16	1276	218	GP	040375(5)	
27	40	0	377	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	378	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	379	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	380	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	381	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	382	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	383	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	384	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	385	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	386	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	387	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	388	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	389	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	390	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	391	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	392	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	393	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	394	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	395	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	396	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	397	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	398	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	399	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	400	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	401	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	402	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	403	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	404	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	405	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	406	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	407	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	408	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	409	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	410	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	411	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	412	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	413	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	414	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	415	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	416	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	417	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	418	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	419	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	420	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	421	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	422	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	423	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	424	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	425	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	426	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	427	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	428	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	429	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	430	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	431	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	432	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

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27	40	0	433	P0	O-16	1276	218	GP	040375(5)
27	40	0	434	P1	O-16	1276	218	GP	040375(5)
27	40	0	435	P2	O-16	1276	218	GP	040375(5)
27	40	0	436	P3	O-16	1276	218	GP	040375(5)
27	40	0	437	P0	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	438	P1	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	439	P2	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	440	P3	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	441	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	442	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	443	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	444	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	445	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	446	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	447	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	448	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	449	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	450	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	451	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	452	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	453	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	454	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	455	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	456	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	457	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	458	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	459	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	460	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	461	P0	U-234	1043	218NGP	WT 1/E P-3	SIGP=5+4 293K R
27	40	0	462	P1	U-234	1043	218NGP	WT 1/E P-3	SIGP=5+4 293K R
27	40	0	463	P2	U-234	1043	218NGP	WT 1/E P-3	SIGP=5+4 293K R
27	40	0	464	P3	U-234	1043	218NGP	WT 1/E P-3	SIGP=5+4 293K R
27	40	0	465	P0	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	466	P1	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	467	P2	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	468	P3	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	469	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	470	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	471	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	472	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	473	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	474	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	475	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	476	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	477	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	478	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	479	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	480	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	481	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	482	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	483	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	484	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	485	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	486	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	487	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	488	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	489	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	490	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	491	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	492	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

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27	40	0	493	P0	O-16	1276	218	GP	040375(5)
27	40	0	494	P1	O-16	1276	218	GP	040375(5)
27	40	0	495	P2	O-16	1276	218	GP	040375(5)
27	40	0	496	P3	O-16	1276	218	GP	040375(5)
27	40	0	497	P0	H 1269	F,	1002	T	218 GP 032475(2)
27	40	0	498	P1	H 1269	F,	1002	T	218 GP 032475(2)
27	40	0	499	P2	H 1269	F,	1002	T	218 GP 032475(2)
27	40	0	500	P3	H 1269	F,	1002	T	218 GP 032475(2)
27	40	0	501	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	502	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	503	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	504	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	505	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	506	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	507	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	508	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	509	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	510	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	511	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	512	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	513	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	514	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	515	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	516	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	517	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	518	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	519	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	520	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	521	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	522	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	523	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	524	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	525	P0	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	526	P1	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	527	P2	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	528	P3	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	529	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	530	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	531	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	532	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	533	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	534	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	535	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	536	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	537	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	538	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	539	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	540	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	541	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	542	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	543	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	544	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	545	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	546	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	547	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	548	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	549	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	550	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	551	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	552	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	553	P0	O-16	1276	218	GP	040375(5)
27	40	0	554	P1	O-16	1276	218	GP	040375(5)
27	40	0	555	P2	O-16	1276	218	GP	040375(5)
27	40	0	556	P3	O-16	1276	218	GP	040375(5)
27	40	0	557	P0	H 1269	F, 1002	T 218	GP	032475(2)
27	40	0	558	P1	H 1269	F, 1002	T 218	GP	032475(2)
27	40	0	559	P2	H 1269	F, 1002	T 218	GP	032475(2)
27	40	0	560	P3	H 1269	F, 1002	T 218	GP	032475(2)
27	40	0	561	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	562	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	563	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	564	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	565	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	566	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	567	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	568	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	569	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	570	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	571	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	572	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	573	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	574	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	575	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	576	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	577	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	578	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	579	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	580	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	581	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	582	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	583	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	584	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	585	P0	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	586	P1	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	587	P2	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	588	P3	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	589	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	590	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	591	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	592	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	593	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	594	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	595	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	596	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	597	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	598	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	599	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	600	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	601	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	602	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	603	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	604	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	605	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	606	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	607	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	608	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	609	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	610	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	611	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	612	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	613	P0	O-16	1276	218	GP	040375(5)	
27	40	0	614	P1	O-16	1276	218	GP	040375(5)	
27	40	0	615	P2	O-16	1276	218	GP	040375(5)	
27	40	0	616	P3	O-16	1276	218	GP	040375(5)	
27	40	0	617	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	618	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	619	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	620	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	621	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	622	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	623	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	624	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	625	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	626	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	627	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	628	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	629	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	630	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	631	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	632	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	633	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	634	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	635	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	636	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	637	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	638	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	639	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	640	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	641	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	642	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	643	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	644	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	645	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	646	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	647	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	648	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	649	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	650	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	651	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	652	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	653	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	654	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	655	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	656	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	657	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	658	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	659	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	660	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	661	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	662	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	663	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	664	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	665	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	666	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	667	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	668	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	669	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	670	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	671	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	672	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	673	P0	O-16	1276	218	GP	040375(5)	
27	40	0	674	P1	O-16	1276	218	GP	040375(5)	
27	40	0	675	P2	O-16	1276	218	GP	040375(5)	
27	40	0	676	P3	O-16	1276	218	GP	040375(5)	
27	40	0	677	P0	H 1269	F	1002	T	218	GP 032475(2)
27	40	0	678	P1	H 1269	F	1002	T	218	GP 032475(2)
27	40	0	679	P2	H 1269	F	1002	T	218	GP 032475(2)
27	40	0	680	P3	H 1269	F	1002	T	218	GP 032475(2)
27	40	0	681	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	682	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	683	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	684	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	685	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	686	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	687	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	688	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	689	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	690	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	691	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	692	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	693	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	694	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	695	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	696	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	697	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	698	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	699	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	700	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	701	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	702	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	703	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	704	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	705	P0	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	706	P1	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	707	P2	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	708	P3	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	709	P0	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	710	P1	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	711	P2	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	712	P3	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	713	P0	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	714	P1	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	715	P2	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	716	P3	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	717	P0	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	718	P1	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	719	P2	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	720	P3	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	721	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	722	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	723	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	724	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	725	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	726	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	727	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	728	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	729	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	730	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	731	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	732	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	733	P0	O-16	1276	218	GP	040375(5)		
27	40	0	734	P1	O-16	1276	218	GP	040375(5)		
27	40	0	735	P2	O-16	1276	218	GP	040375(5)		
27	40	0	736	P3	O-16	1276	218	GP	040375(5)		
27	40	0	737	P0	H	1269	F	1002	T	218	GP 032475(2)
27	40	0	738	P1	H	1269	F	1002	T	218	GP 032475(2)
27	40	0	739	P2	H	1269	F	1002	T	218	GP 032475(2)
27	40	0	740	P3	H	1269	F	1002	T	218	GP 032475(2)
27	40	0	741	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)	-1/E-MAX
27	40	0	742	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)	-1/E-MAX
27	40	0	743	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)	-1/E-MAX
27	40	0	744	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)	-1/E-MAX
27	40	0	745	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)	
27	40	0	746	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)	
27	40	0	747	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)	
27	40	0	748	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)	
27	40	0	749	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)	
27	40	0	750	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)	
27	40	0	751	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)	
27	40	0	752	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)	
27	40	0	753	P0	PU-242	1161	218	GP	WT	F-1/E-M	042375 P3 293K
27	40	0	754	P1	PU-242	1161	218	GP	WT	F-1/E-M	042375 P3 293K
27	40	0	755	P2	PU-242	1161	218	GP	WT	F-1/E-M	042375 P3 293K
27	40	0	756	P3	PU-242	1161	218	GP	WT	F-1/E-M	042375 P3 293K
27	40	0	757	P0	U-236	1163	218	GP	F-1/E-M	040375(5)	
27	40	0	758	P1	U-236	1163	218	GP	F-1/E-M	040375(5)	
27	40	0	759	P2	U-236	1163	218	GP	F-1/E-M	040375(5)	
27	40	0	760	P3	U-236	1163	218	GP	F-1/E-M	040375(5)	
27	40	0	761	P0	U-234	1043	218NGP	WT	1/E	P-3	SIGP=5+4 293K R
27	40	0	762	P1	U-234	1043	218NGP	WT	1/E	P-3	SIGP=5+4 293K R
27	40	0	763	P2	U-234	1043	218NGP	WT	1/E	P-3	SIGP=5+4 293K R
27	40	0	764	P3	U-234	1043	218NGP	WT	1/E	P-3	SIGP=5+4 293K R
27	40	0	765	P0	SN	7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	766	P1	SN	7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	767	P2	SN	7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	768	P3	SN	7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	769	P0	FE	1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	770	P1	FE	1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	771	P2	FE	1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	772	P3	FE	1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	773	P0	NI	1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	774	P1	NI	1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	775	P2	NI	1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	776	P3	NI	1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	777	P0	CR	1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	778	P1	CR	1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	779	P2	CR	1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	780	P3	CR	1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	781	P0	PU-239	1264	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	782	P1	PU-239	1264	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	783	P2	PU-239	1264	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	784	P3	PU-239	1264	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	785	P0	PU-240	1265	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	786	P1	PU-240	1265	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	787	P2	PU-240	1265	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	788	P3	PU-240	1265	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	789	P0	PU-241	1266	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	790	P1	PU-241	1266	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	791	P2	PU-241	1266	218NGP	WT	1/E	P-3	SIGP=5+4 293K
27	40	0	792	P3	PU-241	1266	218NGP	WT	1/E	P-3	SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	793	P0	O-16	1276	218	GP	040375(5)
27	40	0	794	P1	O-16	1276	218	GP	040375(5)
27	40	0	795	P2	O-16	1276	218	GP	040375(5)
27	40	0	796	P3	O-16	1276	218	GP	040375(5)
27	40	0	797	P0	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	798	P1	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	799	P2	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	800	P3	H	1269	F	1002	T 218 GP 032475(2)
27	40	0	801	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	802	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	803	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	804	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	805	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	806	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	807	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	808	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	809	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	810	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	811	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	812	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	813	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	814	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	815	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	816	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	817	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	818	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	819	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	820	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	821	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	822	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	823	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	824	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	825	P0	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	826	P1	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	827	P2	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	828	P3	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	829	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	830	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	831	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	832	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	833	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	834	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	835	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	836	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	837	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	838	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	839	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	840	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	841	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	842	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	843	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	844	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	845	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	846	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	847	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	848	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	849	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	850	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	851	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	852	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	853	P0	O-16	1276	218	GP	040375(5)	
27	40	0	854	P1	O-16	1276	218	GP	040375(5)	
27	40	0	855	P2	O-16	1276	218	GP	040375(5)	
27	40	0	856	P3	O-16	1276	218	GP	040375(5)	
27	40	0	857	P0	H	1269	F,	1002	T	218 GP 032475(2)
27	40	0	858	P1	H	1269	F,	1002	T	218 GP 032475(2)
27	40	0	859	P2	H	1269	F,	1002	T	218 GP 032475(2)
27	40	0	860	P3	H	1269	F,	1002	T	218 GP 032475(2)
27	40	0	861	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	862	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	863	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	864	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	865	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	866	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	867	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	868	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	869	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	870	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	871	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	872	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	873	P0	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	874	P1	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	875	P2	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	876	P3	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	877	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	878	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	879	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	880	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	881	P0	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	882	P1	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	883	P2	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	884	P3	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	885	P0	SN	7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	886	P1	SN	7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	887	P2	SN	7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	888	P3	SN	7039	WT 1/EST	218NGP	P-3	293K RE(042375)
27	40	0	889	P0	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	890	P1	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	891	P2	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	892	P3	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	893	P0	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	894	P1	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	895	P2	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	896	P3	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	897	P0	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	898	P1	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	899	P2	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	900	P3	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	901	P0	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	902	P1	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	903	P2	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	904	P3	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	905	P0	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	906	P1	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	907	P2	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	908	P3	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	909	P0	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	910	P1	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	911	P2	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	912	P3	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	913	P0	O-16	1276	218	GP	040375(5)	
27	40	0	914	P1	O-16	1276	218	GP	040375(5)	
27	40	0	915	P2	O-16	1276	218	GP	040375(5)	
27	40	0	916	P3	O-16	1276	218	GP	040375(5)	
27	40	0	917	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	918	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	919	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	920	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	921	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	922	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	923	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	924	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	925	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	926	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	927	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	928	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	929	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	930	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	931	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	932	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	933	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	934	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	935	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	936	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	937	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	938	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	939	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	940	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	941	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	942	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	943	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	944	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	945	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	946	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	947	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	948	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	949	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	950	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	951	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	952	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	953	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	954	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	955	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	956	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	957	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	958	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	959	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	960	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	961	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	962	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	963	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	964	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	965	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	966	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	967	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	968	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	969	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	970	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	971	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	972	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	973	0	40	P0 0-16 1276 218 GP 040375(5)
27	974	0	40	P1 0-16 1276 218 GP 040375(5)
27	975	0	40	P2 0-16 1276 218 GP 040375(5)
27	976	0	40	P3 0-16 1276 218 GP 040375(5)
27	977	0	40	P0 H 1269 F, 1002 T 218 GP 032475(2)
27	978	0	40	P1 H 1269 F, 1002 T 218 GP 032475(2)
27	979	0	40	P2 H 1269 F, 1002 T 218 GP 032475(2)
27	980	0	40	P3 H 1269 F, 1002 T 218 GP 032475(2)
27	981	0	40	P0 ZR(NAT) 7141 21 NGP WT FIS(0.11020)-1/E-MAX
27	982	0	40	P1 ZR(NAT) 7141 21 NGP WT FIS(0.11020)-1/E-MAX
27	983	0	40	P2 ZR(NAT) 7141 21 NGP WT FIS(0.11020)-1/E-MAX
27	984	0	40	P3 ZR(NAT) 7141 21 NGP WT FIS(0.11020)-1/E-MAX
27	985	0	40	P0 U-235 1261 SIGP=5+4 T=293 218GP 101475(3)
27	986	0	40	P1 U-235 1261 SIGP=5+4 T=293 218GP 101475(3)
27	987	0	40	P2 U-235 1261 SIGP=5+4 T=293 218GP 101475(3)
27	988	0	40	P3 U-235 1261 SIGP=5+4 T=293 218GP 101475(3)
27	989	0	40	P0 U-238 1262 SIGP=5+4 T=293 218GP 092975(5)
27	990	0	40	P1 U-238 1262 SIGP=5+4 T=293 218GP 092975(5)
27	991	0	40	P2 U-238 1262 SIGP=5+4 T=293 218GP 092975(5)
27	992	0	40	P3 U-238 1262 SIGP=5+4 T=293 218GP 092975(5)
27	993	0	40	P0 PU-242 1161 218 GP WT F-1/E-M 042375 P3 293K
27	994	0	40	P1 PU-242 1161 218 GP WT F-1/E-M 042375 P3 293K
27	995	0	40	P2 PU-242 1161 218 GP WT F-1/E-M 042375 P3 293K
27	996	0	40	P3 PU-242 1161 218 GP WT F-1/E-M 042375 P3 293K
27	997	0	40	P0 U-236 1163 218 GP F-1/E-M 040375(5)
27	998	0	40	P1 U-236 1163 218 GP F-1/E-M 040375(5)
27	999	0	40	P2 U-236 1163 218 GP F-1/E-M 040375(5)
27	1000	0	40	P3 U-236 1163 218 GP F-1/E-M 040375(5)
27	1001	0	40	P0 U-234 1043 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1002	0	40	P1 U-234 1043 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1003	0	40	P2 U-234 1043 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1004	0	40	P3 U-234 1043 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1005	0	40	P0 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	1006	0	40	P1 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	1007	0	40	P2 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	1008	0	40	P3 SN 7039 WT 1/EST 218NGP P-3 293K RE(042375)
27	1009	0	40	P0 FE 1192 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1010	0	40	P1 FE 1192 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1011	0	40	P2 FE 1192 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1012	0	40	P3 FE 1192 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1013	0	40	P0 NI 1190 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1014	0	40	P1 NI 1190 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1015	0	40	P2 NI 1190 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1016	0	40	P3 NI 1190 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1017	0	40	P0 CR 1191 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1018	0	40	P1 CR 1191 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1019	0	40	P2 CR 1191 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1020	0	40	P3 CR 1191 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1021	0	40	P0 PU-239 1264 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1022	0	40	P1 PU-239 1264 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1023	0	40	P2 PU-239 1264 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1024	0	40	P3 PU-239 1264 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1025	0	40	P0 PU-240 1265 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1026	0	40	P1 PU-240 1265 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1027	0	40	P2 PU-240 1265 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1028	0	40	P3 PU-240 1265 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1029	0	40	P0 PU-241 1266 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1030	0	40	P1 PU-241 1266 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1031	0	40	P2 PU-241 1266 218NGP WT 1/E P-3 SIGP=5+4 293K R
27	1032	0	40	P3 PU-241 1266 218NGP WT 1/E P-3 SIGP=5+4 293K R

TABLE 3.4. contd

27	40	0	1033	P0	0-16	1276	218	GP	040375(5)	
27	40	0	1034	P1	0-16	1276	218	GP	040375(5)	
27	40	0	1035	P2	0-16	1276	218	GP	040375(5)	
27	40	0	1036	P3	0-16	1276	218	GP	040375(5)	
27	40	0	1037	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1038	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1039	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1040	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1041	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1042	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1043	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1044	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1045	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1046	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1047	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1048	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1049	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1050	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1051	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1052	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1053	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1054	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1055	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1056	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1057	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1058	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1059	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1060	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1061	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1062	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1063	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1064	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1065	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1066	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1067	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1068	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1069	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1070	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1071	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1072	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1073	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1074	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1075	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1076	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1077	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1078	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1079	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1080	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1081	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1082	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1083	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1084	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1085	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1086	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1087	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1088	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1089	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1090	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1091	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1092	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1093	P0	O-16	1276	218	GP	040375(5)	
27	40	0	1094	P1	O-16	1276	218	GP	040375(5)	
27	40	0	1095	P2	O-16	1276	218	GP	040375(5)	
27	40	0	1096	P3	O-16	1276	218	GP	040375(5)	
27	40	0	1097	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1098	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1099	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1100	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1101	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	1102	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	1103	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	1104	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)	-1/E-MAX
27	40	0	1105	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1106	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1107	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1108	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1109	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1110	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1111	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1112	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1113	P0	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	1114	P1	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	1115	P2	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	1116	P3	PU-242	1161	218	GP	WT F-1/E-M	042375 P3 293K
27	40	0	1117	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1118	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1119	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1120	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1121	P0	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	1122	P1	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	1123	P2	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	1124	P3	U-234	1043	218NGP	WT 1/E	P-3	SIGP=5+4 293K R
27	40	0	1125	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1126	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1127	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1128	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1129	P0	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1130	P1	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1131	P2	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1132	P3	FE	1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1133	P0	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1134	P1	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1135	P2	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1136	P3	NI	1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1137	P0	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1138	P1	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1139	P2	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1140	P3	CR	1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1141	P0	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1142	P1	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1143	P2	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1144	P3	PU-239	1264	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1145	P0	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1146	P1	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1147	P2	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1148	P3	PU-240	1265	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1149	P0	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1150	P1	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1151	P2	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K
27	40	0	1152	P3	PU-241	1266	218NGP	WT 1/E	P-3	SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1153	P0	O-16	1276	218	GP	040375(5)	
27	40	0	1154	P1	O-16	1276	218	GP	040375(5)	
27	40	0	1155	P2	O-16	1276	218	GP	040375(5)	
27	40	0	1156	P3	O-16	1276	218	GP	040375(5)	
27	40	0	1157	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1158	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1159	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1160	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1161	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1162	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1163	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1164	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1165	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1166	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1167	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1168	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1169	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1170	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1171	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1172	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1173	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1174	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1175	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1176	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1177	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1178	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1179	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1180	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1181	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1182	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1183	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1184	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1185	P0	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1186	P1	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1187	P2	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1188	P3	SN	7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1189	P0	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1190	P1	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1191	P2	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1192	P3	FE	1192	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1193	P0	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1194	P1	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1195	P2	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1196	P3	NI	1190	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1197	P0	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1198	P1	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1199	P2	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1200	P3	CR	1191	218NGP	WT	1/E	P-3 293K SIGP=5+4 RE(0
27	40	0	1201	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1202	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1203	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1204	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1205	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1206	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1207	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1208	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1209	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1210	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1211	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1212	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1213	P0	O-16	1276	218	GP	040375(5)	
27	40	0	1214	P1	O-16	1276	218	GP	040375(5)	
27	40	0	1215	P2	O-16	1276	218	GP	040375(5)	
27	40	0	1216	P3	O-16	1276	218	GP	040375(5)	
27	40	0	1217	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1218	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1219	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1220	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1221	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1222	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1223	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1224	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1225	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1226	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1227	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1228	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1229	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1230	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1231	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1232	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1233	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1234	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1235	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1236	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1237	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1238	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1239	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1240	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1241	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1242	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1243	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1244	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1245	P0	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1246	P1	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1247	P2	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1248	P3	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1249	P0	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1250	P1	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1251	P2	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1252	P3	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1253	P0	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1254	P1	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1255	P2	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1256	P3	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1257	P0	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1258	P1	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1259	P2	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1260	P3	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1261	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1262	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1263	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1264	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1265	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1266	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1267	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1268	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1269	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1270	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1271	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1272	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	27	40	1273	P0	0-16	1276	218	GP	040375(5)	
27	27	40	1274	P1	0-16	1276	218	GP	040375(5)	
27	27	40	1275	P2	0-16	1276	218	GP	040375(5)	
27	27	40	1276	P3	0-16	1276	218	GP	040375(5)	
27	27	40	1277	P0	H	1269	F	1002	T 218 GP 032475(2)	
27	27	40	1278	P1	H	1269	F	1002	T 218 GP 032475(2)	
27	27	40	1279	P2	H	1269	F	1002	T 218 GP 032475(2)	
27	27	40	1280	P3	H	1269	F	1002	T 218 GP 032475(2)	
27	27	40	1281	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)-1/E-MAX	
27	27	40	1282	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)-1/E-MAX	
27	27	40	1283	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)-1/E-MAX	
27	27	40	1284	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.11020)-1/E-MAX	
27	27	40	1285	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)	
27	27	40	1286	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)	
27	27	40	1287	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)	
27	27	40	1288	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)	
27	27	40	1289	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)	
27	27	40	1290	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)	
27	27	40	1291	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)	
27	27	40	1292	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)	
27	27	40	1293	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K	
27	27	40	1294	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K	
27	27	40	1295	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K	
27	27	40	1296	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K	
27	27	40	1297	P0	U-236	1163	218	GP	F-1/E-M 040375(5)	
27	27	40	1298	P1	U-236	1163	218	GP	F-1/E-M 040375(5)	
27	27	40	1299	P2	U-236	1163	218	GP	F-1/E-M 040375(5)	
27	27	40	1300	P3	U-236	1163	218	GP	F-1/E-M 040375(5)	
27	27	40	1301	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R	
27	27	40	1302	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R	
27	27	40	1303	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R	
27	27	40	1304	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R	
27	27	40	1305	P0	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)	
27	27	40	1306	P1	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)	
27	27	40	1307	P2	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)	
27	27	40	1308	P3	SN 7039	WT 1/EST	218NGP	P-3	293K RE(042375)	
27	27	40	1309	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1310	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1311	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1312	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1313	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1314	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1315	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1316	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1317	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1318	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1319	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1320	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0)	
27	27	40	1321	P0	PU-239	1264	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1322	P1	PU-239	1264	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1323	P2	PU-239	1264	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1324	P3	PU-239	1264	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1325	P0	PU-240	1265	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1326	P1	PU-240	1265	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1327	P2	PU-240	1265	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1328	P3	PU-240	1265	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1329	P0	PU-241	1266	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1330	P1	PU-241	1266	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1331	P2	PU-241	1266	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K
27	27	40	1332	P3	PU-241	1266	218NGP	WT 1/E	P-3	293K SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1333	P0	0-16	1276	218	GP	040375(5)	
27	40	0	1334	P1	0-16	1276	218	GP	040375(5)	
27	40	0	1335	P2	0-16	1276	218	GP	040375(5)	
27	40	0	1336	P3	0-16	1276	218	GP	040375(5)	
27	40	0	1337	P0	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1338	P1	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1339	P2	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1340	P3	H	1269	F	1002	T	218 GP 032475(2)
27	40	0	1341	P0	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1342	P1	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1343	P2	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1344	P3	ZR(NAT)	7141	21	NGP	WT	FIS(0.1T020)-1/E-MAX
27	40	0	1345	P0	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1346	P1	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1347	P2	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1348	P3	U-235	1261	SIGP=5+4	T=293	218GP	101475(3)
27	40	0	1349	P0	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1350	P1	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1351	P2	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1352	P3	U-238	1262	SIGP=5+4	T=293	218GP	092975(5)
27	40	0	1353	P0	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1354	P1	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1355	P2	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1356	P3	PU-242	1161	218	GP	WT	F-1/E-M 042375 P3 293K
27	40	0	1357	P0	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1358	P1	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1359	P2	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1360	P3	U-236	1163	218	GP	F-1/E-M	040375(5)
27	40	0	1361	P0	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1362	P1	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1363	P2	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1364	P3	U-234	1043	218NGP	WT	1/E	P-3 SIGP=5+4 293K R
27	40	0	1365	P0	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1366	P1	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1367	P2	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1368	P3	SN 7039	WT	1/EST	218NGP	P-3	293K RE(042375)
27	40	0	1369	P0	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1370	P1	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1371	P2	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1372	P3	FE 1192	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1373	P0	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1374	P1	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1375	P2	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1376	P3	NI 1190	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1377	P0	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1378	P1	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1379	P2	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1380	P3	CR 1191	218NGP	WT	1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1381	P0	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1382	P1	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1383	P2	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1384	P3	PU-239	1264	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1385	P0	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1386	P1	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1387	P2	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1388	P3	PU-240	1265	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1389	P0	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1390	P1	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1391	P2	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K
27	40	0	1392	P3	PU-241	1266	218NGP	WT	1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1393	P0	O-16	1276	218	GP	040375(5)
27	40	0	1394	P1	O-16	1276	218	GP	040375(5)
27	40	0	1395	P2	O-16	1276	218	GP	040375(5)
27	40	0	1396	P3	O-16	1276	218	GP	040375(5)
27	40	0	1397	P0	H	1269	F,	1002	T 218 GP 032475(2)
27	40	0	1398	P1	H	1269	F,	1002	T 218 GP 032475(2)
27	40	0	1399	P2	H	1269	F,	1002	T 218 GP 032475(2)
27	40	0	1400	P3	H	1269	F,	1002	T 218 GP 032475(2)
27	40	0	1401	P0	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	1402	P1	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	1403	P2	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	1404	P3	ZR(NAT)	7141	21	NGP	WT FIS(0.1T020)-1/E-MAX
27	40	0	1405	P0	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	1406	P1	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	1407	P2	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	1408	P3	U-235	1261	SIGP=5+4	T=293	218GP 101475(3)
27	40	0	1409	P0	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	1410	P1	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	1411	P2	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	1412	P3	U-238	1262	SIGP=5+4	T=293	218GP 092975(5)
27	40	0	1413	P0	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	1414	P1	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	1415	P2	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	1416	P3	PU-242	1161	218	GP	WT F-1/E-M 042375 P3 293K
27	40	0	1417	P0	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	1418	P1	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	1419	P2	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	1420	P3	U-236	1163	218	GP	F-1/E-M 040375(5)
27	40	0	1421	P0	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	1422	P1	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	1423	P2	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	1424	P3	U-234	1043	218NGP	WT 1/E	P-3 SIGP=5+4 293K R
27	40	0	1425	P0	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1426	P1	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1427	P2	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1428	P3	SN 7039	WT	1/EST	218NGP	P-3 293K RE(042375)
27	40	0	1429	P0	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1430	P1	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1431	P2	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1432	P3	FE 1192	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1433	P0	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1434	P1	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1435	P2	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1436	P3	NI 1190	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1437	P0	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1438	P1	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1439	P2	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1440	P3	CR 1191	218NGP	WT 1/E	P-3	293K SIGP=5+4 RE(0
27	40	0	1441	P0	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1442	P1	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1443	P2	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1444	P3	PU-239	1264	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1445	P0	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1446	P1	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1447	P2	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1448	P3	PU-240	1265	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1449	P0	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1450	P1	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1451	P2	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K
27	40	0	1452	P3	PU-241	1266	218NGP	WT 1/E	P-3 SIGP=5+4 293K

TABLE 3.4. contd

27	40	0	1453	P0	SI	1194	218NGP	WT	1/EST	042375	P3	293K
27	40	0	1454	P1	SI	1194	218NGP	WT	1/EST	042375	P3	293K
27	40	0	1455	P2	SI	1194	218NGP	WT	1/EST	042375	P3	293K
27	40	0	1456	P3	SI	1194	218NGP	WT	1/EST	042375	P3	293K
27	40	0	1457	P0	B-11	1160	WT	1/EST	218NGP	P-3	293K	RE(042375
27	40	0	1458	P1	B-11	1160	WT	1/EST	218NGP	P-3	293K	RE(042375
27	40	0	1459	P2	B-11	1160	WT	1/EST	218NGP	P-3	293K	RE(042375
27	40	0	1460	P3	B-11	1160	WT	1/EST	218NGP	P-3	293K	RE(042375
27	40	0	1461	P0	C-12	1274	218NGP		042375	P-3	293K	
27	40	0	1462	P1	C-12	1274	218NGP		042375	P-3	293K	
27	40	0	1463	P2	C-12	1274	218NGP		042375	P-3	293K	
27	40	0	1464	P3	C-12	1274	218NGP		042375	P-3	293K	
27	40	0	1465	P0	B-10	1273	218NGP		042375	P-3	293K	
27	40	0	1466	P1	B-10	1273	218NGP		042375	P-3	293K	
27	40	0	1467	P2	B-10	1273	218NGP		042375	P-3	293K	
27	40	0	1468	P3	B-10	1273	218NGP		042375	P-3	293K	
27	40	0	1469	P0	FE	1192	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1470	P1	FE	1192	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1471	P2	FE	1192	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1472	P3	FE	1192	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1473	P0	NI	1190	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1474	P1	NI	1190	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1475	P2	NI	1190	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1476	P3	NI	1190	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1477	P0	CR	1191	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1478	P1	CR	1191	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1479	P2	CR	1191	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1480	P3	CR	1191	218NGP	WT	1/E	P-3	293K	SIGP=5+4 RE(0
27	40	0	1481	P0	MN-55	1197	218NGP	WT	1/E	P-3	293K	SIGP=5+4 R
27	40	0	1482	P1	MN-55	1197	218NGP	WT	1/E	P-3	293K	SIGP=5+4 R
27	40	0	1483	P2	MN-55	1197	218NGP	WT	1/E	P-3	293K	SIGP=5+4 R
27	40	0	1484	P3	MN-55	1197	218NGP	WT	1/E	P-3	293K	SIGP=5+4 R
7	7	7	7									

ELAPSED TIME 20.99 MIN.

APPENDIX A

APPENDIX A

This appendix contains input decks that were used to make DASQHE, NITAWL, XSDRNPM, GIP, and ANISN runs to generate the results presented in this report. The NITAWL and XSDRNPM input decks also show command lines before and after the input data. These command lines were necessary since these runs were made on a UNIVAC system. The GIP and ANISN runs were made on a VAX system while the DASQHE runs were made on an IBM PC/AT.

TABLE A.1. DASQHE Input for 0.8600 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO2, 0.86 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8    NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.1279400E+01

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.2. DASQHE Input for 0.7359 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.7359 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:

.1094780E+01

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)

.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)

.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000

NAME = GE 8X8

TABLE A.3. DASQHE Input for 0.7220 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO2, 0.7720 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA = 1    NALF = 128
NRAD =      128      IRES = 8    NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.1074100E+01

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.4. DASQHE Input for 0.6940 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.6940 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID = .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8      NMS =      1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.1032450E+01

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
                                PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
                                PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.5. DASQHE Input for 0.6452 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO2, 0.6452 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8    NMS =      1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.9598500E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02    .1170000E+02    .1060000E+02    .1320000E+02
.1154000E+02    .1172000E+02    .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07    .3062270E-03    .5720690E-04    .1112530E-03
.3156850E-04    .1611190E-04    .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```


TABLE A.6. DASQHE Input for 0.5893 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.5893 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8      NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.8766900E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order:  U-234, U-235, U-236, U-238, Pu-239, Pu-240,
                                                    PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .1320000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order:  U-234, U-235, U-236, U-238, Pu-239, Pu-240,
                                                    PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.7. DASQHE Input for 0.5404 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.5404 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.8039400E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.8. DASQHE Input for 0.4916 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.4916 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID = .0000000    NSIGMA = 1          NALF = 128
NRAD =      128      IRES = 8           NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.7313400E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .1320000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.9. DASQHE Input for 0.4567 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.4567 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:

.6794200E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)

.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)

.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000

NAME = GE 8X8

TABLE A.10. DASQHE Input for 0.4287 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.4287 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.6377700E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.11. DASQHE Input for 0.4008 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.4008 g/cc H2O)
                                INPUT FOR DASQHE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF =      128
NRAD =      128      IRES =      8      NMS =      1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.5962600E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order:  U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order:  U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.12. DASQHE Input for 0.3799 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.3799 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.5651700E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.13. DASQHE Input for 0.3589 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.3589 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:

.5339300E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)

.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)

.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000

NAME = GE 8X8

TABLE A.14. DASQHE Input for 0.3449 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.3449 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID = .0000000    NSIGMA =      1    NALF = 128
NRAD =    128      IRES =      8      NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.5131000E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02    .1170000E+02    .1060000E+02    .132000E+02
.1154000E+02    .1172000E+02    .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07    .3062270E-03    .5720690E-04    .2526560E-01    .1112530E-03
.3156850E-04    .1611190E-04    .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.15. DASQHE Input for 0.3310 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.3310 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8    NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4924200E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.16. DASQHE Input for 0.3240 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.3240 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:

.4820100E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)

.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)

.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000

NAME = GE 8X8

TABLE A.17. DASQHE Input for 0.3100 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.3100 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8    NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4611800E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.18. DASQHE Input for 0.3031 g/cc H₂O General Electric Fuel Assembly

O GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.3031 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4509200E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.19. DASQHE Input for 0.2961 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU U02, 0.2961 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8      NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4405000E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```

TABLE A.20. DASQHE Input for 0.2891 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.2891 g/cc H₂O)
 INPUT FOR DASQUE EXECUTION

NLAT = 4 PITCH = 1.6280000 RADIUS = .5232400
 GAPWID = .0000000 NSIGMA = 1 NALF = 128
 NRAD = 128 IRES = 8 NMS = 1

MODERATOR MACROSCOPIC CROSS SECTIONS:
 .4300900E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
 .3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
 PU-241, PU-242)

.1031000E+02 .1170000E+02 .1060000E+02 .132000E+02
 .1154000E+02 .1172000E+02 .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
 .4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
 PU-241, PU-242)

.1313310E-07 .3062270E-03 .5720690E-04 .1112530E-03
 .3156850E-04 .1611190E-04 .2767390E-05 .2526560E-01

TEMPERATURE OF SYSTEM = 1365.0000
 NAME = GE 8X8

TABLE A.21. DASQHE Input for 0.2821 g/cc H₂O General Electric Fuel Assembly

```

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO2, 0.2821 g/cc H2O)
                                INPUT FOR DASQUE EXECUTION

NLAT =      4      PITCH = 1.6280000    RADIUS = .5232400
GAPWID =      .0000000    NSIGMA =      1    NALF = 128
NRAD =      128      IRES =      8      NMS =      1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4196700E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1031000E+02      .1170000E+02      .1060000E+02      .132000E+02
.1154000E+02      .1172000E+02      .1159000E+02

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)
.1313310E-07      .3062270E-03      .5720690E-04      .1112530E-03
.3156850E-04      .1611190E-04      .2767390E-05

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

```


TABLE A.22. DASQHE Input for 0.2751 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.2751 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.4092600E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240,
PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.23. DASQHE Input for 0.63 g/cc H₂O General Electric Fuel Assembly

0 GE 8x8 BWR FUEL (15,000 MWD/MTU UO₂, 0.63 g/cc H₂O)

INPUT FOR DASQUE EXECUTION

NLAT =	4	PITCH =	1.6280000	RADIUS =	.5232400
GAPWID =	.0000000	NSIGMA =	1	NALF =	128
NRAD =	128	IRES =	8	NMS =	1

MODERATOR MACROSCOPIC CROSS SECTIONS:
.9372400E+00

LIGHT ELEMENT SCATTERING CROSS SECTIONS: (0-16)
.3704000E+01

HEAVY ELEMENT SCATTERING CROSS SECTIONS: (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1031000E+02	.1170000E+02	.1060000E+02	.1060000E+02	.132000E+02
.1154000E+02	.1172000E+02	.1159000E+02		

LIGHT ELEMENT NUMBER DENSITY (#/B-CM): (0-16)
.4619630E-01

HEAVY ELEMENT NUMBER DENSITY (#/B-CM): (In Order: U-234, U-235, U-236, U-238, Pu-239, Pu-240, PU-241, PU-242)

.1313310E-07	.3062270E-03	.5720690E-04	.2526560E-01	.1112530E-03
.3156850E-04	.1611190E-04	.2767390E-05		

TEMPERATURE OF SYSTEM = 1365.0000
NAME = GE 8X8

TABLE A.24. NITAWL Input Used to Generate A Cross Section Library to Make Pin Cell Calculations

```

@RUN,N NITAWL/100/1//,PNL299/SMS299,SHORT,360,500 .
@IDENT . M SCHUTZ/SIGMA3
@PRT,S BWR.NITAWL1
@ASG,pu OUTbwr1.,///1000
@ERS OUTbwr1.
@BRKPT PRINT$/OUTbwr1
@ASG,PU NITAWLBWR4.,///1000
@ERS NITAWLBWR4.
@USE 4,NITAWLBWR4.
@ASG,T 18.,///1000
@ASG,T 19.,///1000
@ASG,T 9.,///1000
@ASG,A CIL*CMLIB.
@USE 60,CIL*CMLIB.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED)
0$$ 60 2 3 4 18 19 9 15 20
1$$ 0 408 0 0 0 0 0 192 0 0 0 0 1T
' U-234
2$$ 104302 -2348600 -2347359 -2347220 -2346940 -2346452 -2345893
    -2345404 -2344916 -2344567 -2344287 -2344008 -2343799 -2343589
    -2343449 -2343310 -2343240 -2343100 -2343031 -2342961 -2342891
    -2342821 -2342751 -2346300
' U-235
    1261 -2358600 -2357359 -2357220 -2356940 -2356452 -2355893
    -2355404 -2354916 -2354567 -2354287 -2354008 -2353799 -2353589
    -2353449 -2353310 -2353240 -2353100 -2353031 -2352961 -2352891
    -2352821 -2352751 -2356300
' U-236
    116302 -2368600 -2367359 -2367220 -2366940 -2366452 -2365893
    -2365404 -2364916 -2364567 -2364287 -2364008 -2363799 -2363589
    -2363449 -2363310 -2363240 -2363100 -2363031 -2362961 -2362891
    -2362821 -2362751 -2366300
' U-238
    1262 -2388600 -2387359 -2387220 -2386940 -2386452 -2385893
    -2385404 -2384916 -2384567 -2384287 -2384008 -2383799 -2383589
    -2383449 -2383310 -2383240 -2383100 -2383031 -2382961 -2382891
    -2382821 -2382751 -2386300
' PU-239
    126402 -2398600 -2397359 -2397220 -2396940 -2396452 -2395893
    -2395404 -2394916 -2394567 -2394287 -2394008 -2393799 -2393589
    -2393449 -2393310 -2393240 -2393100 -2393031 -2392961 -2392891
    -2392821 -2392751 -2396300

```

TABLE A.24. (contd)

PU-240						
126502	-2408600	-2407359	-2407220	-2406940	-2406452	-2405893
-2405404	-2404916	-2404567	-2404287	-2404008	-2403799	-2403589
-2403449	-2403310	-2403240	-2403100	-2403031	-2402961	-2402891
-2402821	-2402751	-2406300				
PU-241						
126602	-2418600	-2417359	-2417220	-2416940	-2416452	-2415893
-2415404	-2414916	-2414567	-2414287	-2414008	-2413799	-2413589
-2413449	-2413310	-2413240	-2413100	-2413031	-2412961	-2412891
-2412821	-2412751	-2416300				
PU-242						
1161	-2428600	-2427359	-2427220	-2426940	-2426452	-2425893
-2425404	-2424916	-2424567	-2424287	-2424008	-2423799	-2423589
-2423449	-2423310	-2423240	-2423100	-2423031	-2422961	-2422891
-2422821	-2422751	-2426300				
O (NAT)						
1276	-168600	-167359	-167220	-166940	-166452	-165893
-165404	-164916	-164567	-164287	-164008	-163799	-163589
-163449	-163310	-163240	-163100	-163031	-162961	-162891
-162821	-162751	-166300				
H (NAT)						
1269	-18600	-17359	-17220	-16940	-16452	-15893
-15404	-14916	-14567	-14287	-14008	-13799	-13589
-13449	-13310	-13240	-13100	-13031	-12961	-12891
-12821	-12751	-16300				
B-10						
127303	-108600	-107359	-107220	-106940	-106452	-105893
-105404	-104916	-104567	-104287	-104008	-103799	-103589
-103449	-103310	-103240	-103100	-103031	-102961	-102891
-102821	-102751	-106300				
B-11						
116003	-118600	-117359	-117220	-116940	-116452	-115893
-115404	-114916	-114567	-114287	-114008	-113799	-113589
-113449	-113310	-113240	-113100	-113031	-112961	-112891
-112821	-112751	-116300				
ZR (NAT)						
714102	-918600	-917359	-917220	-916940	-916452	-915893
-915404	-914916	-914567	-914287	-914008	-913799	-913589
-913449	-913310	-913240	-913100	-913031	-912961	-912891
-912821	-912751	-916300				
SN (NAT)						
703903	-1198600	-1197359	-1197220	-1196940	-1196452	-1195893
-1195404	-1194916	-1194567	-1194287	-1194008	-1193799	-1193589
-1193449	-1193310	-1193240	-1193100	-1193031	-1192961	-1192891
-1192821	-1192751	-1196300				

TABLE A.24. (contd)

' FE (NAT)						
119202	-568600	-567359	-567220	-566940	-566452	-565893
-565404	-564916	-564567	-564287	-564008	-563799	-563589
-563449	-563310	-563240	-563100	-563031	-562961	-562891
-562821	-562751	-566300				
' CR (NAT)						
119102	-528600	-527359	-527220	-526940	-526452	-525893
-525404	-524916	-524567	-524287	-524008	-523799	-523589
-523449	-523310	-523240	-523100	-523031	-522961	-522891
-522821	-522751	-526300				
' NI (NAT)						
119002	-598600	-597359	-597220	-596940	-596452	-595893
-595404	-594916	-594567	-594287	-594008	-593799	-593589
-593449	-593310	-593240	-593100	-593031	-592961	-592891
-592821	-592751	-596300				
' GENERIC UO2						
3** 104302	1365 2 .52324	.1771330	9.3753900+7	1.3133100-8	1 15.9994	
	1.3029000+7	1 238.050760	2.7281120+5	1 1.0		
1261	1365 2 .52324	.1771330	4.0208060+3	3.0622700-4	1 15.9994	
	5.5877200+2	1 238.050760	4.4216300-4	1 1.0		
116302	1365 2 .52324	.1771330	2.1523270+4	5.7206900-5	1 15.9994	
	2.9910920+3	1 238.050760	2.3668870-3	1 1.0		
1262	1365 2 .52324	.1771330	4.8733430+1	2.5265600-2	1 15.9994	
	6.7724920+0	1 235.043933	5.3591550-6	1 1.0		
126402	1365 2 .52324	.1771330	1.1067380+4	1.1125300-4	1 15.9994	
	1.5380360+3	1 238.050760	1.2170660-3	1 1.0		
126502	1365 2 .52324	.1771330	3.9003420+4	3.1568500-5	1 15.9994	
	5.4203110+3	1 238.050760	4.2891570-3	1 1.0		
126602	1365 2 .52324	.1771330	7.6420490+4	1.6111900-5	1 15.9994	
	1.0620170+4	1 238.050760	8.4038670-3	1 1.0		
1161	1365 2 .52324	.1771330	4.4492440+5	2.7673900-6	1 15.9994	
	6.1831210+4	1 238.050760	4.8927780-2	1 1.0		
' UO2 (.8600 g/cc H2O)						
2348600	1365 2 .52324	.1771330	9.3753900+7	1.3133100-8	1 15.9994	
	1.3029000+7	1 238.050760	2.7281120+5	1 1.0		
2358600	1365 2 .52324	.1771330	4.0208060+3	3.0622700-4	1 15.9994	
	5.5877200+2	1 238.050760	4.4216300-4	1 1.0		
2368600	1365 2 .52324	.1771330	2.1523270+4	5.7206900-5	1 15.9994	
	2.9910920+3	1 238.050760	2.3668870-3	1 1.0		
2388600	1365 2 .52324	.1771330	4.8733430+1	2.5265600-2	1 15.9994	
	6.7724920+0	1 235.043933	5.3591550-6	1 1.0		
2398600	1365 2 .52324	.1771330	1.1067380+4	1.1125300-4	1 15.9994	
	1.5380360+3	1 238.050760	1.2170660-3	1 1.0		
2408600	1365 2 .52324	.1771330	3.9003420+4	3.1568500-5	1 15.9994	
	5.4203110+3	1 238.050760	4.2891570-3	1 1.0		
2418600	1365 2 .52324	.1771330	7.6420490+4	1.6111900-5	1 15.9994	
	1.0620170+4	1 238.050760	8.4038670-3	1 1.0		
2428600	1365 2 .52324	.1771330	4.4492440+5	2.7673900-6	1 15.9994	
	6.1831210+4	1 238.050760	4.8927780-2	1 1.0		

TABLE A.24. (contd)

' U02 (.7359 g/cc H2O)

2347359	1365	2	.52324	.2155057	9.0961840+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2357359	1365	2	.52324	.2155057	3.9010630+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2367359	1365	2	.52324	.2155057	2.0882290+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2387359	1365	2	.52324	.2155057	4.7282110+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2397359	1365	2	.52324	.2155057	1.0737790+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2407359	1365	2	.52324	.2155057	3.7841870+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2417359	1365	2	.52324	.2155057	7.4144630+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2427359	1365	2	.52324	.2155057	4.3167420+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

' U02 (.7220 g/cc H2O)

2347220	1365	2	.52324	.2204190	9.0604350+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2357220	1365	2	.52324	.2204190	3.8857310+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2367220	1365	2	.52324	.2204190	2.0800220+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2387220	1365	2	.52324	.2204190	4.7096290+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2397220	1365	2	.52324	.2204190	1.0695580+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2407220	1365	2	.52324	.2204190	3.7693140+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2417220	1365	2	.52324	.2204190	7.3853230+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2427220	1365	2	.52324	.2204190	4.2997770+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

TABLE A.24. (contd)

' U02 (.6940 g/cc H2O)

2346940	1365	2	.52324	.2307555	8.9852250+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2356940	1365	2	.52324	.2307555	3.8534760+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2366940	1365	2	.52324	.2307555	2.0627550+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2386940	1365	2	.52324	.2301555	4.6705340+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2396940	1365	2	.52324	.2301555	1.0606800+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2406940	1365	2	.52324	.2301555	3.7380250+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2416940	1365	2	.52324	.2301555	7.3240180+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2426940	1365	2	.52324	.2301555	4.2640840+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

' U02 (.6452 g/cc H2O)

2346452	1365	2	.52324	.2502805	8.8431580+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2356452	1365	2	.52324	.2502805	3.7925490+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2366452	1365	2	.52324	.2502805	2.0301410+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2386452	1365	2	.52324	.2502805	4.5966880+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2396452	1365	2	.52324	.2502805	1.0439100+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2406452	1365	2	.52324	.2502805	3.6789230+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2416452	1365	2	.52324	.2502805	7.2082170+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2426452	1365	2	.52324	.2502805	4.1966650+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

TABLE A.24. (contd)

' U02 (.5893 g/cc H2O)

2345893	1365	2	.52324	.2753109	8.6610330+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2355893	1365	2	.52324	.2753109	3.7144410+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2365893	1365	2	.52324	.2753109	1.9883300+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2385893	1365	2	.52324	.2753109	4.5020190+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2395893	1365	2	.52324	.2753109	1.0224100+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2405893	1365	2	.52324	.2753109	3.6031550+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2415893	1365	2	.52324	.2753109	7.0597640+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2425893	1365	2	.52324	.2753109	4.1102340+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

' U02 (.5404 g/cc H2O)

2345404	1365	2	.52324	.2999179	8.4819890+7	1.3133100-8	1	15.9994
				1.3029000+7	1	238.050760	2.7281120+5	1 1.0
2355404	1365	2	.52324	.2999179	3.6376540+3	3.0622700-4	1	15.9994
				5.5877200+2	1	238.050760	4.4216300-4	1 1.0
2365404	1365	2	.52324	.2999179	1.9472270+4	5.7206900-5	1	15.9994
				2.9910920+3	1	238.050760	2.3668870-3	1 1.0
2385404	1365	2	.52324	.2999179	4.4089510+1	2.5265600-2	1	15.9994
				6.7724920+0	1	235.043933	5.3591550-6	1 1.0
2395404	1365	2	.52324	.2999179	1.0012750+4	1.1125300-4	1	15.9994
				1.5380360+3	1	238.050760	1.2170660-3	1 1.0
2405404	1365	2	.52324	.2999179	3.5286700+4	3.1568500-5	1	15.9994
				5.4203110+3	1	238.050760	4.2891570-3	1 1.0
2415404	1365	2	.52324	.2999179	6.9138210+4	1.6111900-5	1	15.9994
				1.0620170+4	1	238.050760	8.4038670-3	1 1.0
2425404	1365	2	.52324	.2999179	4.0252660+5	2.7673900-6	1	15.9994
				6.1831210+4	1	238.050760	4.8927780-2	1 1.0

TABLE A.24. (contd)

U02 (.4916 g/cc H2O)													
2344916	1365	2	.52324	.3274137	8.2819250+7	1.3133100-8	1	15.9994					
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0			
2354916	1365	2	.52324	.3274137	3.5518540+3	3.0622700-4	1	15.9994					
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0			
2364916	1365	2	.52324	.3274137	1.9012980+4	5.7206900-5	1	15.9994					
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0			
2384916	1365	2	.52324	.3274137	4.3049580+1	2.5265600-2	1	15.9994					
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0			
2394916	1365	2	.52324	.3274137	9.7765760+3	1.1125300-4	1	15.9994					
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0			
2404916	1365	2	.52324	.3274137	3.4454390+4	3.1568500-5	1	15.9994					
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0			
2414916	1365	2	.52324	.3274137	6.7507460+4	1.6111900-5	1	15.9994					
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0			
2424916	1365	2	.52324	.3274137	3.9303220+5	2.7673900-6	1	15.9994					
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0			
U02 (.4567 g/cc H2O)													
2344567	1365	2	.52324	.3491478	8.1237840+7	1.3133100-8	1	15.9994					
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0			
2354567	1365	2	.52324	.3491478	3.4840320+3	3.0622700-4	1	15.9994					
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0			
2364567	1365	2	.52324	.3491478	1.8649930+4	5.7206900-5	1	15.9994					
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0			
2384567	1365	2	.52324	.3491478	4.2227560+1	2.5265600-2	1	15.9994					
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0			
2394567	1365	2	.52324	.3491478	9.5898960+3	1.1125300-4	1	15.9994					
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0			
2404567	1365	2	.52324	.3491478	3.3796500+4	3.1568500-5	1	15.9994					
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0			
2414567	1365	2	.52324	.3491478	6.6218420+4	1.6111900-5	1	15.9994					
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0			
2424567	1365	2	.52324	.3491478	3.8552740+5	2.7673900-6	1	15.9994					
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0			

TABLE A.24. (contd)

' U02 (.4287 g/cc H2O)

2344287	1365	2	.52324	.3679974	7.9866320+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
								1.0
2354287	1365	2	.52324	.3679974	3.4252120+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
								1.0
2364287	1365	2	.52324	.3679974	1.8335070+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
								1.0
2384287	1365	2	.52324	.3679974	4.1514640+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
								1.0
2394287	1365	2	.52324	.3679974	9.4279910+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
								1.0
2404287	1365	2	.52324	.3679974	3.3225920+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
								1.0
2414287	1365	2	.52324	.3679974	6.5100470+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
								1.0
2424287	1365	2	.52324	.3679974	3.7901860+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
								1.0

' U02 (.4008 g/cc H2O)

2344008	1365	2	.52324	.3881729	7.8398310+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
								1.0
2354008	1365	2	.52324	.3881729	3.3622540+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
								1.0
2364008	1365	2	.52324	.3881729	1.7998050+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
								1.0
2384008	1365	2	.52324	.3881729	4.0751570+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
								1.0
2394008	1365	2	.52324	.3881729	9.2546970+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
								1.0
2404008	1365	2	.52324	.3881729	3.2615200+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
								1.0
2414008	1365	2	.52324	.3881729	6.3903880+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
								1.0
2424008	1365	2	.52324	.3881729	3.7205200+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
								1.0

TABLE A.24. (contd)

U02 (.3799 g/ccH2O)												
2343799	1365	2	.52324	.4042742	7.7226770+7	1.3133100-8	1	15.9994				
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0		
2353799	1365	2	.52324	.4042742	3.3120100+3	3.0622700-4	1	15.9994				
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0		
2363799	1365	2	.52324	.4042742	1.7729100+4	5.7206900-5	1	15.9994				
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0		
2383799	1365	2	.52324	.4042742	4.0142600+1	2.5265600-2	1	15.9994				
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0		
2393799	1365	2	.52324	.4042742	9.1163990+3	1.1125300-4	1	15.9994				
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0		
2403799	1365	2	.52324	.4042742	3.2217810+4	3.1568500-5	1	15.9994				
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0		
2413799	1365	2	.52324	.4042742	6.2948930+4	1.6111900-5	1	15.9994				
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0		
2423799	1365	2	.52324	.4042742	3.6649220+5	2.7673900-6	1	15.9994				
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0		
U02 (.3589 g/cc H2O)												
2343589	1365	2	.52324	.4213872	7.5981590+7	1.3133100-8	1	15.9994				
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0		
2353589	1365	2	.52324	.4213872	3.2586080+3	3.0622700-4	1	15.9994				
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0		
2363589	1365	2	.52324	.4213872	1.7443240+4	5.7206900-5	1	15.9994				
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0		
2383589	1365	2	.52324	.4213872	3.9495360+1	2.5265600-2	1	15.9994				
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0		
2393589	1365	2	.52324	.4213872	8.9694110+3	1.1125300-4	1	15.9994				
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0		
2403589	1365	2	.52324	.4213872	3.1609800+4	3.1568500-5	1	15.9994				
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0		
2413589	1365	2	.52324	.4213872	6.1933960+4	1.6111900-5	1	15.9994				
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0		
2423589	1365	2	.52324	.4213872	3.6058300+5	2.7673900-6	1	15.9994				
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0		

TABLE A.24. (contd)

' U02 (.3449 g/cc H2O)

2343449	1365	2	.52324	.4333550	7.5110800+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
					1	1.0		
2353449	1365	2	.52324	.4333550	3.2212620+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
					1	1.0		
2363449	1365	2	.52324	.4333550	1.7243330+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
					1	1.0		
2383449	1365	2	.52324	.4333550	3.9042710+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
					1	1.0		
2393449	1365	2	.52324	.4333550	8.8666150+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
					1	1.0		
2403449	1365	2	.52324	.4333550	3.1247530+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
					1	1.0		
2413449	1365	2	.52324	.4333550	6.1224160+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
					1	1.0		
2423449	1365	2	.52324	.4333550	3.5645050+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
					1	1.0		

' U02 (.3310 g/cc H2O)

2343310	1365	2	.52324	.4457035	7.4212300+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
					1	1.0		
2353310	1365	2	.52324	.4457035	3.1827290+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
					1	1.0		
2363310	1365	2	.52324	.4457035	1.7037060+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
					1	1.0		
2383310	1365	2	.52324	.4457035	3.8575680+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
					1	1.0		
2393310	1365	2	.52324	.4457035	8.7605510+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
					1	1.0		
2403310	1365	2	.52324	.4457035	3.0873740+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
					1	1.0		
2413310	1365	2	.52324	.4457035	6.0491780+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
					1	1.0		
2423310	1365	2	.52324	.4457035	3.5218660+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
					1	1.0		

TABLE A.24. (contd)

' U02 (.3240 g/cc H2O)

2343240	1365	2	.52324	.4521067	7.3746400+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
2353240	1365	2	.52324	.4521067	3.1627480+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
2363240	1365	2	.52324	.4521067	1.6930100+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
2383240	1365	2	.52324	.4521067	3.8333500+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
2393240	1365	2	.52324	.4521067	8.7055520+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
2403240	1365	2	.52324	.4521067	3.0679910+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
2413240	1365	2	.52324	.4521067	6.0112020+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
2423240	1365	2	.52324	.4521067	3.4997550+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2

' U02 (.3100 g/cc H2O)

2343100	1365	2	.52324	.4653023	7.2786260+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
2353100	1365	2	.52324	.4653023	3.1215710+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
2363100	1365	2	.52324	.4653023	1.6709680+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
2383100	1365	2	.52324	.4653023	3.7834420+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
2393100	1365	2	.52324	.4653023	8.5922110+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
2403100	1365	2	.52324	.4653023	3.0280480+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
2413100	1365	2	.52324	.4653023	5.9329390+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
2423100	1365	2	.52324	.4653023	3.4541900+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2

TABLE A.24. (contd)

' U02 (.3031 g/cc H2O)

2343031	1365	2	.52324	.4720045	7.2298600+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
								1 1.0
2353031	1365	2	.52324	.4720045	3.1006560+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
								1 1.0
2363031	1365	2	.52324	.4720045	1.6597730+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
								1 1.0
2383031	1365	2	.52324	.4720045	3.7580930+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
								1 1.0
2393031	1365	2	.52324	.4720045	8.5346440+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
								1 1.0
2403031	1365	2	.52324	.4720045	3.0077600+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
								1 1.0
2413031	1365	2	.52324	.4720045	5.8931890+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
								1 1.0
2423031	1365	2	.52324	.4720045	3.4310480+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
								1 1.0

' U02 (.2961 g/cc H2O)

2342961	1365	2	.52324	.4789463	7.1793500+7	1.3133100-8	1	15.9994
					1.3029000+7	1	238.050760	2.7281120+5
								1 1.0
2352961	1365	2	.52324	.4789463	3.0789940+3	3.0622700-4	1	15.9994
					5.5877200+2	1	238.050760	4.4216300-4
								1 1.0
2362961	1365	2	.52324	.4789463	1.6481780+4	5.7206900-5	1	15.9994
					2.9910920+3	1	238.050760	2.3668870-3
								1 1.0
2382961	1365	2	.52324	.4789463	3.7318380+1	2.5265600-2	1	15.9994
					6.7724920+0	1	235.043933	5.3591550-6
								1 1.0
2392961	1365	2	.52324	.4789463	8.4750190+3	1.1125300-4	1	15.9994
					1.5380360+3	1	238.050760	1.2170660-3
								1 1.0
2402961	1365	2	.52324	.4789463	2.9867470+4	3.1568500-5	1	15.9994
					5.4203110+3	1	238.050760	4.2891570-3
								1 1.0
2412961	1365	2	.52324	.4789463	5.8520180+4	1.6111900-5	1	15.9994
					1.0620170+4	1	238.050760	8.4038670-3
								1 1.0
2422961	1365	2	.52324	.4789463	3.4070780+5	2.7673900-6	1	15.9994
					6.1831210+4	1	238.050760	4.8927780-2
								1 1.0

TABLE A.24. (contd)

U02 (.2891 g/cc H2O)										
2342891	1365	2	.52324	.4860277	7.1278250+7	1.3133100-8	1	15.9994		
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0
2352891	1365	2	.52324	.4860277	3.0568970+3	3.0622700-4	1	15.9994		
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0
2362891	1365	2	.52324	.4860277	1.6363490+4	5.7206900-5	1	15.9994		
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0
2382891	1365	2	.52324	.4860277	3.7050550+1	2.5265600-2	1	15.9994		
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0
2392891	1365	2	.52324	.4860277	8.4141940+3	1.1125300-4	1	15.9994		
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0
2402891	1365	2	.52324	.4860277	2.9653120+4	3.1568500-5	1	15.9994		
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0
2412891	1365	2	.52324	.4860277	5.8100180+4	1.6111900-5	1	15.9994		
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0
2422891	1365	2	.52324	.4860277	3.3826250+5	2.7673900-6	1	15.9994		
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0
U02 (.2821 g/cc H2O)										
2342821	1365	2	.52324	.4932635	7.0751770+7	1.3133100-8	1	15.9994		
					1.3029000+7	1	238.050760	2.7281120+5	1	1.0
2352821	1365	2	.52324	.4932635	3.0343180+3	3.0622700-4	1	15.9994		
					5.5877200+2	1	238.050760	4.4216300-4	1	1.0
2362821	1365	2	.52324	.4932635	1.6242620+4	5.7206900-5	1	15.9994		
					2.9910920+3	1	238.050760	2.3668870-3	1	1.0
2382821	1365	2	.52324	.4932635	3.6776880+1	2.5265600-2	1	15.9994		
					6.7724920+0	1	235.043933	5.3591550-6	1	1.0
2392821	1365	2	.52324	.4932635	8.3520440+3	1.1125300-4	1	15.9994		
					1.5380360+3	1	238.050760	1.2170660-3	1	1.0
2402821	1365	2	.52324	.4932635	2.9434090+4	3.1568500-5	1	15.9994		
					5.4203110+3	1	238.050760	4.2891570-3	1	1.0
2412821	1365	2	.52324	.4932635	5.7671040+4	1.6111900-5	1	15.9994		
					1.0620170+4	1	238.050760	8.4038670-3	1	1.0
2422821	1365	2	.52324	.4932635	3.3576400+5	2.7673900-6	1	15.9994		
					6.1831210+4	1	238.050760	4.8927780-2	1	1.0

TABLE A.24. (contd)

```
' U02 (.2751 g/cc H2O)
  2342751 1365 2 .52324 .5006428 7.0214840+7 1.3133100-8 1 15.9994
    1.3029000+7 1 238.050760 2.7281120+5 1 1.0
  2352751 1365 2 .52324 .5006428 3.0112900+3 3.0622700-4 1 15.9994
    5.5877200+2 1 238.050760 4.4216300-4 1 1.0
  2362751 1365 2 .52324 .5006428 1.6119360+4 5.7206900-5 1 15.9994
    2.9910920+3 1 238.050760 2.3668870-3 1 1.0
  2382751 1365 2 .52324 .5006428 3.6497780+1 2.5265600-2 1 15.9994
    6.7724920+0 1 235.043933 5.3591550-6 1 1.0
  2392751 1365 2 .52324 .5006428 8.2886610+3 1.1125300-4 1 15.9994
    1.5380360+3 1 238.050760 1.2170660-3 1 1.0
  2402751 1365 2 .52324 .5006428 2.9210710+4 3.1568500-5 1 15.9994
    5.4203110+3 1 238.050760 4.2891570-3 1 1.0
  2412751 1365 2 .52324 .5006428 5.7233380+4 1.6111900-5 1 15.9994
    1.0620170+4 1 238.050760 8.4038670-3 1 1.0
  2422751 1365 2 .52324 .5006428 3.3321590+5 2.7673900-6 1 15.9994
    6.1831210+4 1 238.050760 4.8927780-2 1 1.0
' U02 (.6300 g/cc H2O)
  2346300 1365 2 .52324 .2567891 8.7958010+7 1.3133100-8 1 15.9994
    1.3029000+7 1 238.050760 2.7281120+5 1 1.0
  2356300 1365 2 .52324 .2567891 3.7722380+3 3.0622700-4 1 15.9994
    5.5877200+2 1 238.050760 4.4216300-4 1 1.0
  2366300 1365 2 .52324 .2567891 2.0192690+4 5.7206900-5 1 15.9994
    2.9910920+3 1 238.050760 2.3668870-3 1 1.0
  2386300 1365 2 .52324 .2567891 4.5720710+1 2.5265600-2 1 15.9994
    6.7724920+0 1 235.043933 5.3591550-6 1 1.0
  2396300 1365 2 .52324 .2567891 1.0383190+4 1.1125300-4 1 15.9994
    1.5380360+3 1 238.050760 1.2170660-3 1 1.0
  2406300 1365 2 .52324 .2567891 3.6592210+4 3.1568500-5 1 15.9994
    5.4203110+3 1 238.050760 4.2891570-3 1 1.0
  2416300 1365 2 .52324 .2567891 7.1696150+4 1.6111900-5 1 15.9994
    1.0620170+4 1 238.050760 8.4038670-3 1 1.0
  2426300 1365 2 .52324 .2567891 4.1741900+5 2.7673900-6 1 15.9994
    6.1831210+4 1 238.050760 4.8927780-2 1 1.0
4** 192R 1365 96R 559 120R 566 T
@MSLIMIT
@BRKPT PRINT$
@FREE OUTBWR1.
@SYM,U OUTBWR1.
@FIN
```


TABLE A.25. NITAWL Input Used to Generate a Cross Section Library of Control Cell Isotopes

```

@RUN,N NITAWL/100/1//,SMS299/PNL299,SHORT,60,200 .
@IDENT . M SCHUTZ/SIGMA3
@PRT,S BWR.BWRCONT
@ASG,PU bwrOUT2.,///1000
@BRKPT PRINT$/bwrOUT2
@ASG,PU NITAWLbwr4A.,///1000
@USE 4,NITAWLbwr4A.
@ASG,A NITAWLbwr4.
@USE 2,NITAWLbwr4.
@ASG,T 18,///1000
@ASG,T 19,///1000
@ASG,T 9,///1000
@ASG,A CIL*CMLIB.
@USE 60,CIL*CMLIB.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, CONTROL)
0$$ 60 E
1$$ 0 20 17 0 A8 0 A11 0 E 1T
2$$ 127303 -10001 119202 -56001 119102 -52001
    119002 -59001 119702 -55001 119403 -28001
    1276 -16001 1269 -1001 116003
    -11001 127403 -12001
    2348600 2358600 2368600 2388600 2398600 2408600 2418600
    2428600 918600 1198600 568600 528600 598600 168600
    18600 108600 118600
4** 20R 600 8R 1365 5R 566 4R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE bwrOUT2.
@SYM,U BWRROUT2.
@FIN

```

TABLE A.26. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.8600 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P7359OUT1.,///1000
@ERS P7359OUT1.
@BRKPT PRINT$/P7359OUT1
@ASG,AX NITAWLBWR4.
@USE 4,NITAWLBWR4.
@ASG,PU PIN73593.,///1000
@USE 3,PIN73593.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.7359 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H20)
13$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2347359      2357359      2367359      2387359      2397359      2407359
!
!      Pu-241      Pu-242      O-16
!      2417359      2427359      167359
!
!      Zr(nat)      Sn(nat)      Fe(nat)      Cr(nat)      Ni(nat)
!      917359      1197359      567359      527359      597359
!
!      H      O-16
!      17359      167359
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P7359OUT1
@sym,u p7359out1.
@FIN

```

TABLE A.27. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.7359 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P7359OUT1.,///1000
@ERS P7359OUT1.
@BRKPT PRINT$/P7359OUT1
@ASG,AX NITAWLBWR4.
@USE 4,NITAWLBWR4.
@ASG,PU PIN73593.,///1000
@USE 3,PIN73593.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.7359 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$ 102 103 107
' Region 1: Fuel Region (UO2)
' Region 2: Cladding Region (ZR-2)
' Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
'      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2347359      2357359      2367359      2387359      2397359      2407359
'      Pu-241      Pu-242      O-16
'      2417359      2427359      167359
'      Zr(nat)      Sn(nat)      Fe(nat)      Cr(nat)      Ni(nat)
'      917359      1197359      567359      527359      597359
'      H      O-16
'      17359      167359
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P7359OUT1
@sym,u p7359out1.
@FIN

```

TABLE A.28. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.7220 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P7220OUT1.,///1000
@ERS P7220OUT1.
@BRKPT PRINT$/P7220OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN7220
@USE 4,NITAWLBWR4.
@ASG,PU PIN72203.,///1000
@USE 3,PIN72203.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.7220 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2347220      2357220      2367220      2387220      2397220      2407220
!
!              Pu-241      Pu-242      O-16
!              2417220      2427220      167220
!      Zr(nat)      Sn(nat)      Fe(nat)      Cr(nat)      NI(nat)
!      917220      1197220      567220      527220      597220
!
!      H      O-16
!      17220      167220
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P7220OUT1
@FIN

```

TABLE A.29. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.6940 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P6940OUT1.,///1000
@ERS P6940OUT1.
@BRKPT PRINT$/P6940OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN6940
@USE 4,NITAWLBWR4.
@ASG,PU PIN69403.,///1000
@USE 3,PIN69403.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.6940 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H20)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2346940    2356940    2366940    2386940    2396940    2406940
!
!      Pu-241      Pu-242      O-16
!      2416940    2426940    166940
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    NI(nat)
!      916940    1196940    566940    526940    596940
!      H          O-16
!      16940     166940
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P6940OUT1
@FIN

```

TABLE A.30. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.6452 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P6452OUT1.,///1000
@ERS P6452OUT1.
@BRKPT PRINT$/P6452OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN6452
@USE 4,NITAWLBWR4.
@ASG,PU PIN64523.,///1000
@USE 3,PIN64523.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.6452 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
' Region 1: Fuel Region (UO2)
' Region 2: Cladding Region (ZR-2)
' Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
'
'      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2346452    2356452    2366452    2386452    2396452    2406452
'
'              Pu-241      Pu-242      O-16
'              2416452    2426452    166452
'      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  Ni(nat)
'      916452  1196452  566452  526452  596452
'
'      H      O-16
'      16452  166452
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P6452OUT1
@SYM,U P6452OUT1.
@FIN

```

TABLE A.31. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.5893 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P5893OUT1.,///1000
@ERS P5893OUT1.
@BRKPT PRINT$/P5893OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN5893
@USE 4,NITAWLBWR4.
@ASG,PU PIN58933.,///1000
@USE 3,PIN58933.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.5893 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$      2345893      2355893      2365893      2385893      2395893      2405893
!
!      Pu-241      Pu-242      O-16
!      2415893      2425893      165893
!
!      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  Ni(nat)
!      915893   1195893  565893  525893  595893
!
!      H      O-16
!      15893   165893
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P5893OUT1
@SYM,U P5893OUT1.
@FIN

```

TABLE A.32. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.5404 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P5404OUT1.,///1000
@ERS P5404OUT1.
@BRKPT PRINT$/P5404OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN5404
@USE 4,NITAWLBWR4.
@ASG,PU PIN54043.,///1000
@USE 3,PIN54043.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.5404 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H20)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2345404      2355404      2365404      2385404      2395404      2405404
!
!              Pu-241      Pu-242      0-16
!              2415404      2425404      165404
!
!      Zr(nat)      Sn(nat)      Fe(nat)      Cr(nat)      NI(nat)
!      915404      1195404      565404      525404      595404
!
!      H      0-16
!      15404      165404
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P5404OUT1
@SYM,U P5404OUT1.
@FIN

```


TABLE A.33. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.4916 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P4916OUT1.,///1000
@ERS P4916OUT1.
@BRKPT PRINT$/P4916OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN4916
@USE 4,NITAWLBWR4.
@ASG,PU PIN49163.,///1000
@USE 3,PIN49163.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.4916 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2344916    2354916    2364916    2384916    2394916    2404916
!
!              Pu-241      Pu-242      O-16
!              2414916    2424916    164916
!
!      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  NI(nat)
!      914916  1194916  564916  524916  594916
!
!      H      O-16
!      14916  164916
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!
!              1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
!      2T
33### F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P4916OUT1
@SYM,U P4916OUT1.
@FIN

```

TABLE A.34. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.4567 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P4567OUT1.,///1000
@ERS P4567OUT1.
@BRKPT PRINT$/P4567OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN4567
@USE 4,NITAWLBWR4.
@ASG,PU PIN45673.,///1000
@USE 3,PIN45673.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.4567 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$ 102 103 107
' Region 1: Fuel Region (UO2)
' Region 2: Cladding Region (ZR-2)
' Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
'      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2344567    2354567    2364567    2384567    2394567    2404567
'      Pu-241      Pu-242      O-16
'      2414567    2424567    164567
'      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    NI(nat)
'      914567    1194567    564567    524567    594567
'      H      O-16
'      14567    164567
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P4567OUT1
@FIN

```

TABLE A.35. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.4287 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P4287OUT1.,///1000
@ERS P4287OUT1.
@BRKPT PRINT$/P4287OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN4287
@USE 4,NITAWLBWR4.
@ASG,PU PIN42873.,///1000
@USE 3,PIN42873.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.4287 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$ 102 103 107
' Region 1: Fuel Region (UO2)
' Region 2: Cladding Region (ZR-2)
' Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
'      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2344287 2354287 2364287 2384287 2394287 2404287
'      Pu-241      Pu-242      O-16
'      2414287 2424287 164287
'      Zr(nat) Sn(nat) Fe(nat) Cr(nat) Ni(nat)
'      914287 1194287 564287 524287 594287
'      H      O-16
'      14287 164287
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P4287OUT1
@FIN

```

TABLE A.36. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.4008 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P4008OUT1.,///1000
@ERS P4008OUT1.
@BRKPT PRINT$/P4008OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN4008
@USE 4,NITAWLBWR4.
@ASG,PU PIN40083.,///1000
@USE 3,PIN40083.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.4008 g/cc H2O)
1$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$ A7 0 E
3$$ 1 6R0 0 E
4$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$ 9R1 5R2 2R3
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$ 2344008 2354008 2364008 2384008 2394008 2404008
!      Pu-241      Pu-242      O-16
!      2414008 2424008 164008
!      Zr(nat) Sn(nat) Fe(nat) Cr(nat) Ni(nat)
!      914008 1194008 564008 524008 594008
!      H      O-16
!      14008 164008
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$ 9R1 2R2 9R3
39$$ 1 2 3
40$$ F3
51$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P4008OUT1
@FIN

```

TABLE A.37. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3799 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3799OUT1.,///1000
@ERS P3799OUT1.
@BRKPT PRINT$/P3799OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN3799
@USE 4,NITAWLBWR4.
@ASG,PU PIN37993.,///1000
@USE 3,PIN37993.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3799 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2343799    2353799    2363799    2383799    2393799    2403799
!
!      Pu-241      Pu-242      O-16
!      2413799    2423799    163799
!
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    NI(nat)
!      913799    1193799    563799    523799    593799
!
!      H          O-16
!      13799      163799
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3799OUT1
@FIN

```

TABLE A.38. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3589 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3589OUT1.,///1000
@ERS P3589OUT1.
@BRKPT PRINT$/P3589OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN3589
@USE 4,NITAWLBWR4.
@ASG,PU PIN35893.,///1000
@USE 3,PIN35893.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3589 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
! U-234 U-235 U-236 U-238 Pu-239 Pu-240
14$$$ 2343589 2353589 2363589 2383589 2393589 2403589
!
! Pu-241 Pu-242 O-16
! 2413589 2423589 163589
! Zr(nat) Sn(nat) Fe(nat) Cr(nat) Ni(nat)
! 913589 1193589 563589 523589 593589
!
! H O-16
! 13589 163589
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
! 1.61119-5 2.76739-6 4.61963-2
! 4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
! 6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3589OUT1
@SYM,U P3589OUT1.
@FIN

```

TABLE A.39. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3449 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3449OUT1.,///1000
@ERS P3449OUT1.
@BRKPT PRINT$/P3449OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN3449
@USE 4,NITAWLBWR4.
@ASG,PU PIN34493.,///1000
@USE 3,PIN34493.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3449 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2343449    2353449    2363449    2383449    2393449    2403449
!
!      Pu-241      Pu-242      O-16
!      2413449    2423449    163449
!
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    Ni(nat)
!      913449    1193449    563449    523449    593449
!
!      H          O-16
!      13449      163449
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3449OUT1
@SYM,U P3449OUT1.
@FIN

```

TABLE A.40. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3310 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3310OUT1.,///1000
@ERS P3310OUT1.
@BRKPT PRINT$/P3310OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN3310
@USE 4,NITAWLBWR4.
@ASG,PU PIN33103.,///1000
@USE 3,PIN33103.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3310 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
! U-234 U-235 U-236 U-238 Pu-239 Pu-240
14$$$ 2343310 2353310 2363310 2383310 2393310 2403310
!
! Pu-241 Pu-242 O-16
! 2413310 2423310 163310
! Zr(nat) Sn(nat) Fe(nat) Cr(nat) Ni(nat)
! 913310 1193310 563310 523310 593310
!
! H O-16
! 13310 163310
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
! 1.61119-5 2.76739-6 4.61963-2
! 4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
! 6.68560-2 3.34280-2
2T
33### F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3310OUT1
@SYM,U P3310OUT1.
@FIN

```


TABLE A.41. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3240 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3240OUT1.,///1000
@ERS P3240OUT1.
@BRKPT PRINT$/P3240OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN3240
@USE 4,NITAWLBWR4.
@ASG,PU PIN32403.,///1000
@USE 3,PIN32403.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3240 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2343240      2353240      2363240      2383240      2393240      2403240
!
!              Pu-241      Pu-242      O-16
!              2413240      2423240      163240
!      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  Ni(nat)
!      913240  1193240  563240  523240  593240
!
!      H      O-16
!      13240  163240
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
!      2T
33### F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3240OUT1
@SYM,U P3240OUT1.
@FIN

```

TABLE A.42. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3100 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P31000UT1.,///1000
@ERS P31000UT1.
@BRKPT PRINT$/P31000UT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN3100
@USE 4,NITAWLBWR4.
@ASG,PU PIN31003.,///1000
@USE 3,PIN31003.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
' BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3100 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
' Region 1: Fuel Region (U02)
' Region 2: Cladding Region (ZR-2)
' Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
'      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2343100    2353100    2363100    2383100    2393100    2403100
'      Pu-241      Pu-242      O-16
'      2413100    2423100    163100
'      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    NI(nat)
'      913100    1193100    563100    523100    593100
'      H          O-16
'      13100     163100
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P31000UT1
@SYM,U P31000UT1.
@FIN

```

TABLE A.43. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.3031 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P3031OUT1.,///1000
@ERS P3031OUT1.
@BRKPT PRINT$/P3031OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN3031
@USE 4,NITAWLBWR4.
@ASG,PU PIN30313.,///1000
@USE 3,PIN30313.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.3031 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2343031    2353031    2363031    2383031    2393031    2403031
!      Pu-241      Pu-242      O-16
!      2413031    2423031    163031
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    Ni(nat)
!      913031    1193031    563031    523031    593031
!      H          O-16
!      13031     163031
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P3031OUT1
@SYM,U P3031OUT1.
@FIN

```

TABLE A.44. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.2961 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P2961OUT1.,///1000
@ERS P2961OUT1.
@BRKPT PRINT$/P2961OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN2961
@USE 4,NITAWLBWR4.
@ASG,PU PIN29613.,///1000
@USE 3,PIN29613.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.2961 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2342961    2352961    2362961    2382961    2392961    2402961
!      Pu-241      Pu-242      O-16
!      2412961    2422961    162961
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    Ni(nat)
!      912961    1192961    562961    522961    592961
!      H          O-16
!      12961      162961
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33### F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P2961OUT1
@SYM,U P2961OUT1.
@FIN

```

TABLE A.45. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.2891 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P2891OUT1.,///1000
@ERS P2891OUT1.
@BRKPT PRINT$/P2891OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN2891
@USE 4,NITAWLBWR4.
@ASG,PU PIN28913.,///1000
@USE 3,PIN28913.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.2891 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2342891    2352891    2362891    2382891    2392891    2402891
!
!              Pu-241      Pu-242      O-16
!              2412891    2422891    162891
!      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  Ni(nat)
!      912891  1192891  562891  522891  592891
!      H      O-16
!      12891  162891
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
!      1.61119-5 2.76739-6 4.61963-2
!      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
!      6.68560-2 3.34280-2
!      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P2891OUT1
@SYM,U P2891OUT1.
@FIN

```

TABLE A.46. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.2821 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P2821OUT1.,///1000
@ERS P2821OUT1.
@BRKPT PRINT$/P2821OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN2821
@USE 4,NITAWLBWR4.
@ASG,PU PIN28213.,///1000
@USE 3,PIN28213.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.2821 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H20)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2342821    2352821    2362821    2382821    2392821    2402821
!
!      Pu-241      Pu-242      O-16
!      2412821    2422821    162821
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    Ni(nat)
!      912821    1192821    562821    522821    592821
!      H          O-16
!      12821     162821
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P2821OUT1
@SYM,U P2821OUT1.
@FIN

```

TABLE A.47. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.2751 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P2751OUT1.,///1000
@ERS P2751OUT1.
@BRKPT PRINT$/P2751OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR,PIN2751
@USE 4,NITAWLBWR4.
@ASG,PU PIN27513.,///1000
@USE 3,PIN27513.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.2751 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (U02)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2342751    2352751    2362751    2382751    2392751    2402751
!
!              Pu-241      Pu-242      O-16
!              2412751    2422751    162751
!      Zr(nat)  Sn(nat)  Fe(nat)  Cr(nat)  Ni(nat)
!      912751  1192751  562751  522751  592751
!
!      H      O-16
!      12751  162751
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P2751OUT1
@SYM,U P2751OUT1.
@FIN

```

TABLE A.48. XSDRNPM Input Used to Make a Pin Cell Calculation
for an 8 x 8R General Electric Fuel Assembly
with 0.6300 g/cc Water

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,30,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU P6300OUT1.,///1000
@ERS P6300OUT1.
@BRKPT PRINT$/P6300OUT1
@ASG,AX NITAWLBWR4.
@PRT,S BWR.PIN6300
@USE 4,NITAWLBWR4.
@ASG,PU PIN63003.,///1000
@USE 3,PIN63003.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, 0.6300 g/cc H2O)
1$$$ 2 3 20 1 3 3 16 16 3 1 20 20 3R 0
2$$$ A7 0 E
3$$$ 1 6R0 0 E
4$$$ -1 27 30 -1 13 14 40 -1 3
5** 2R1,-5 E 1T
12$$$ 102 103 107
! Region 1: Fuel Region (UO2)
! Region 2: Cladding Region (ZR-2)
! Region 3: Moderator Region (H2O)
13$$$ 9R1 5R2 2R3
!      U-234      U-235      U-236      U-238      Pu-239      Pu-240
14$$$ 2346300    2356300    2366300    2386300    2396300    2406300
!      Pu-241      Pu-242      O-16
!      2416300    2426300    166300
!      Zr(nat)    Sn(nat)    Fe(nat)    Cr(nat)    NI(nat)
!      916300    1196300    566300    526300    596300
!      H      O-16
!      16300    166300
15** 1.31331-8 3.06227-4 5.72069-5 2.52656-2 1.11253-4 3.15685-5
      1.61119-5 2.76739-6 4.61963-2
      4.29175-2 4.81890-4 1.48325-4 7.58620-5 4.03119-5
      6.68560-2 3.34280-2
      2T
33## F1 4T
35** 810.0 11 0.52324 81 0.61468 0.91858
36$$$ 9R1 2R2 9R3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE P6300OUT1
@SYM,U P6300OUT1.
@FIN

```


TABLE A.49. XSDRNPM Input Used to Make a Control Cell Calculation
for an 8 x 8R General Electric Fuel Assembly

```

@RUN XSDRN/250/1//,PNL299/SMS299,SHORT,60,300 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU PCONTRL.,///1000
@ERS PCONTRL.
@BRKPT PRINT$/PCONTRL
@PRT,S BWR,PINCNTL
@ASG,AX NITAWLBWR4A.
@USE 4,NITAWLBWR4A.
@ASG,PU PINCONTRL.,///1000
@USE 3,PINCONTRL.
@ERS 3.
@ASG,AX UPJ*XSDRNPM.
@XQT UPJ*XSDRNPM.
! BWR GE 8x8 MODEL (12000 MWD/MTU, 2.4% ENRICHED, CONTROL CELL)
1$$$ 2 3 40 1 3 3 26 16 3 1 20 20 0 0 0
2$$$ A7 0 E
3$$$ 1 7R 0 E
4$$$ -3 27 30 -1 13 14 40 -1 3
5** 2R1.-5 E 1T
12$$$ 102 103 107
13$$$ 8R 1 16R 2 2R 3
! Region 1: B4C and SS-304
14$$$ 10001 11001 12001
56001 52001 59001 28001 55001
! Region 2: UO2 Fuel, Zr-2, and H2O moderator
2348600 2358600 2368600 2388600 2398600 2408600
2418600 2428600 168600
918600 1198600 568600 528600 598600
18600 168600
! Region 3: H2O moderator
18600 168600
15** 2.03144-3 8.33308-3 2.56237-3
5.04256-2 1.52728-2 7.11904-3 2.97628-3 1.14117-3
4.26169-9 9.93707-5 1.85636-5 8.19869-3 3.61016-5
1.02440-5 5.22831-6 8.98018-7 1.49907-2
5.29173-3 5.94170-5 1.82885-5 9.35378-6 4.97046-6
3.69179-2 1.84589-2
6.68560-2 3.34280-2
2T
33## F1 4T
35** 141 0.0 191 5.7192 41 16.5058 17.1965
36$$$ 15R 1 20R 2 5R 3
39$$$ 1 2 3
40$$$ F3
51$$$ 2511 27 5T
@MSLIMIT
@BRKPT PRINT$
@FREE PCONTRL
@SYM,U PCONTRL.
@FIN

```

TABLE A.50. NITAWL Input Used to Combine General Electric Fuel Assembly
Pin Cell Cross Section Libraries for 0.8600 g/cc and
0.7359 g/cc Water Density into One Library (COMB1)

```

@RUN COMB1/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu comb1.,///500
@ERS comb1.
@BRKPT PRINT$/comb1
@ASG,PU NITAWLCOMB1.,///500
@ERS NITAWLCOMB1.
@USE 4,NITAWLCOMB1.
@asg,ax pin86003.
@use 2,pin86003.
@asg,ax pin73593.
@USE 3,pin73593.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2348600 2358600 2368600 2388600 2398600 2408600
    418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE comb1.
@SYM,U comb1.
@FIN

```

TABLE A.51. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.7220 g/cc and 0.6940 g/cc Water Density into One Library (COMB2)

```

@RUN COMB2/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB2.,///500
@ERS COMB2.
@BRKPT PRINT$/COMB2
@ASG,PU NITAWLCOMB2.,///500
@ERS NITAWLCOMB2.
@USE 4,NITAWLCOMB2.
@asg,ax pin72203.
@use 2,pin72203.
@asg,ax pin69403.
@USE 3,pin69403.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
0$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB2.
@SYM,U COMB2.
@DELETE PIN72203.
@DELETE PIN69403.
@FIN

```

TABLE A.52. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.6452 g/cc and 0.5893 g/cc Water Density into One Library (COMB3)

```

@RUN COMB3/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,PU COMB3.,///500
@ERS COMB3.
@BRKPT PRINT$/COMB3
@ASG,PU NITAWLCOMB3.,///500
@ERS NITAWLCOMB3.
@USE 4,NITAWLCOMB3.
@ASG,AX PIN64523.
@USE 2,PIN64523.
@ASG,AX PIN58933.
@USE 3,PIN58933.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB1.
@SYM,U COMB3.
@DELETE PIN64523.
@DELETE PIN58933.
@FIN

```

TABLE A.53. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.5404 g/cc and 0.4916 g/cc Water Density into One Library (COMB4)

```

@RUN NITAWL/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB4.,///500
@ERS COMB4.
@BRKPT PRINT$/COMB4
@ASG,PU NITAWLCOMB4.,///500
@ERS NITAWLCOMB4.
@USE 4,NITAWLCOMB4.
@asg,ax pin54043.
@use 2,pin54043.
@asg,ax pin49163.
@USE 3,pin49163.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2345404 2355404 2365404 2385404 2395404 2405404
    2415404 2425404 915404 1195404 565404 525404
    595404 165404 15404
    2344916 2354916 2364916 2384916 2394916 2404916
    2414916 2424916 914916 1194916 564916 524916
    594916 164916 14916
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB4.
@SYM,U COMB4.
@DELETE PIN54043.
@DELETE PIN49163.
@FIN

```

TABLE A.54. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.4567 g/cc and 0.4287 g/cc Water Density into One Library (COMB5)

```

@RUN COMB5/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB5.,///500
@ERS COMB5.
@BRKPT PRINT$/COMB5
@ASG,PU NITAWLCOMB5.,///500
@ERS NITAWLCOMB5.
@USE 4,NITAWLCOMB5.
@asg,ax pin45673.
@use 2,pin45673.
@asg,ax pin42873.
@USE 3,pin42873.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2344567 2354567 2364567 2384567 2394567 2404567
    2414567 2424567 914567 1194567 564567 524567
    594567 164567 14567
    2344287 2354287 2364287 2384287 2394287 2404287
    2414287 2424287 914287 1194287 564287 524287
    594287 164287 14287
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB5.
@SYM,U COMB5.
@DELETE PIN45673.
@DELETE PIN42873.
@FIN

```

TABLE A.55. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.4008 g/cc and 0.3799 g/cc Water Density into One Library (COMB6)

```

@RUN COMB6/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB6.,///500
@ERS COMB6.
@BRKPT PRINT$/COMB6
@ASG,PU NITAWLCOMB6.,///500
@ERS NITAWLCOMB6.
@USE 4,NITAWLCOMB6.
@asg,ax pin40083.
@use 2,pin40083.
@asg,ax pin37993.
@USE 3,pin37993.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2344008 2354008 2364008 2384008 2394008 2404008
    2414008 2424008 914008 1194008 564008 524008
    594008 164008 14008
    2343799 2453799 2363799 2383799 2393799 2403799
    2413799 2423799 913799 1193799 563799 523799
    593799 163799 13799
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB6.
@SYM,U COMB6.
@DELETE PIN40083.
@DELETE PIN37993.
@FIN

```

TABLE A.56. NITAWL Input Used to Combine General Electric Fuel
Assembly Pin Cell Cross Section Libraries for
0.3589 g/cc and 0.3449 g/cc Water Density into
One Library (COMB7)

```

@RUN COMB7/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB7.,///500
@ERS COMB7.
@BRKPT PRINT$/COMB7
@ASG,PU NITAWLCOMB7.,///500
@ERS NITAWLCOMB7.
@USE 4,NITAWLCOMB7.
@asg,ax pin35893.
@use 2,pin35893.
@asg,ax pin34493.
@USE 3,pin34493.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
0$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2343589 2353589 2363589 2383589 2393589 2403589
    2413589 2423589 913589 1193589 563589 523589
    593589 163589 13589
    2343449 2353449 2363449 2383449 2393449 2403449
    2413449 2423449 913449 1193449 563449 523449
    593449 163449 13449
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB7.
@SYM,U COMB7.
@DELETE PIN35893.
@DELETE PIN34493.
@FIN

```


TABLE A.57. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.3310 g/cc and 0.3240 g/cc Water Density into One Library (COMB8)

```

@RUN COMB8/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB8.,///500
@ERS COMB8.
@BRKPT PRINT$/COMB8
@ASG,PU NITAWLCOMB8.,///500
@ERS NITAWLCOMB8.
@USE 4,NITAWLCOMB8.
@asg,ax pin33103.
@use 2,pin33103.
@asg,ax pin32403.
@USE 3,pin32403.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2343310 2353310 2363310 2383310 2393310 2403310
    2413310 2423310 913310 1193310 563310 523310
    593310 163310 13310
    2343240 2353240 2363240 2383240 2393240 2403240
    2413240 2423240 913240 1193240 563240 523240
    593240 163240 13240
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB8.
@SYM,U COMB8.
@DELETE PIN33103.
@DELETE PIN32403.
@FIN

```

TABLE A.58. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.3100 g/cc and 0.3031 g/cc Water Density into One Library (COMB9)

```

@RUN COMB9/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB9.,///500
@ERS COMB9.
@BRKPT PRINT$/COMB9
@ASG,PU NITAWLCOMB9.,///500
@ERS NITAWLCOMB9.
@USE 4,NITAWLCOMB9.
@asg,ax pin31003.
@use 2,pin31003.
@asg,ax pin30313.
@USE 3,pin30313.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2343100 2353100 2363100 2383100 2393100 2403100
    2413100 2423100 913100 1193100 563100 523100
    593100 163100 13100
    2343031 2353031 2363031 2383031 2393031 2403031
    2413031 2423031 913031 1193031 563031 523031
    593031 163031 13031
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB9.
@SYM,U COMB9.
@DELETE PIN31003.
@DELETE PIN30313.
@FIN

```

TABLE A.59. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.2961 g/cc and 0.2891 g/cc Water Density into One Library (COMB10)

```

@RUN COMB10/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB10.,///500
@ERS COMB10.
@BRKPT PRINT$/COMB10
@ASG,PU NITAWLCOMB10.,///500
@ERS NITAWLCOMB10.
@USE 4,NITAWLCOMB10.
@asg,ax pin29613.
@use 2,pin29613.
@asg,ax pin28913.
@USE 3,pin28913.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2342961 2352961 2362961 2382961 2392961 2402961
    2412961 2422961 912961 1192961 562961 522961
    592961 162961 12961
    2342891 2352891 2362891 2382891 2392891 2402891
    2412891 2422891 912891 1192891 562891 522891
    592891 162891 12891
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB10.
@SYM,U COMB10.
@DELETE PIN29613.
@DELETE PIN28913.
@FIN

```

TABLE A.60. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.2821 g/cc and 0.2751 g/cc Water Density into One Library (COMB11)

```

@RUN COMB11/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB11.,///500
@ERS COMB11.
@BRKPT PRINT$/COMB11
@ASG,PU NITAWLCOMB11.,///500
@ERS NITAWLCOMB11.
@USE 4,NITAWLCOMB11.
@asg,ax pin28213.
@use 2,pin28213.
@asg,ax pin27513.
@USE 3,pin27513.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
0$$ 1 E
1$$ 0 0 15 15 A8 0 A11 0 E 1T
2$$ 2342821 2352821 2362821 2382821 2392821 2402821
    2412821 2422821 912821 1192821 562821 522821
    592821 162821 12821
    2342751 2352751 2362751 2382751 2392751 2402751
    2412751 2422751 912751 1192751 562751 522751
    592751 162751 12751
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB11.
@SYM,U COMB11.
@DELETE PIN28213.
@DELETE PIN27513.
@FIN

```

TABLE A.61. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB1 and COMB2 into One Library (COMB12)

```

@RUN COMB12/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB12.,///500
@ERS COMB12.
@BRKPT PRINT$/COMB12
@ASG,PU NITAWLCOMB12.,///500
@ERS NITAWLCOMB12.
@USE 4,NITAWLCOMB12.
@PRT,S BWR.COMB12
@asg,ax NITAWLCOMB1.
@use 2,NITAWLCOMB1.
@asg,ax NITAWLCOMB2.
@USE 3,NITAWLCOMB2.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 30 A8 0 A11 0 E 1T
2$$ 2348600 2358600 2368600 2388600 2398600 2408600
    2418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB12.
@SYM,U COMB12.
@DELETE NITAWLCOMB1.
@DELETE NITAWLCOMB2.
@FIN

```

TABLE A.62. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB3 and COMB4 into One Library (COMB13)

```

@RUN COMB13/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB13.,///500
@ERS COMB13.
@BRKPT PRINT$/COMB13
@ASG,PU NITAWLCOMB13.,///500
@ERS NITAWLCOMB13.
@USE 4,NITAWLCOMB13.
@PRT,S BWR.COMB13
@asg,ax NITAWLCOMB3.
@use 2,NITAWLCOMB3.
@asg,ax NITAWLCOMB4.
@USE 3,NITAWLCOMB4.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 30 A8 0 A11 0 E 1T
2$$ 2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
    2345404 2355404 2365404 2385404 2395404 2405404
    2415404 2425404 915404 1195404 565404 525404
    595404 165404 15404
    2344916 2354916 2364916 2384916 2394916 2404916
    2414916 2424916 914916 1194916 564916 524916
    594916 164916 14916
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB13.
@SYM,U COMB13.
@DELETE NITAWLCOMB3.
@DELETE NITAWLCOMB4.
@FIN

```

TABLE A.63. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB5 and COMB6 into One Library (COMB14)

```

@RUN COMB14/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB14.,///500
@ERS COMB14.
@BRKPT PRINT$/COMB14
@ASG,PU NITAWLCOMB14.,///500
@ERS NITAWLCOMB14.
@USE 4,NITAWLCOMB14.
@PRT,S BWR.COMB14
@asg,ax NITAWLCOMB5.
@use 2,NITAWLCOMB5.
@asg,ax NITAWLCOMB6.
@USE 3,NITAWLCOMB6.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 30 A8 0 A11 0 E 1T
2$$ 2344567 2354567 2364567 2384567 2394567 2404567
    2414567 2424567 914567 1194567 564567 524567
    594567 164567 14567
    2344287 2354287 2364287 2384287 2394287 2404287
    2414287 2424287 914287 1194287 564287 524287
    594287 164287 14287
    2344008 2354008 2364008 2384008 2394008 2404008
    2414008 2424008 914008 1194008 564008 524008
    594008 164008 14008
    2343799 2353799 2363799 2383799 2393799 2403799
    2413799 2423799 913799 1193799 563799 523799
    593799 163799 13799
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB14.
@SYM,U COMB14.
@DELETE NITAWLCOMB5.
@DELETE NITAWLCOMB6.
@FIN

```

TABLE A.64. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB7 and COMB8 into One Library (COMB15)

```

@RUN COMB15/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB15.,///500
@ERS COMB15.
@BRKPT PRINT$/COMB15
@ASG,PU NITAWLCOMB15.,///500
@ERS NITAWLCOMB15.
@USE 4,NITAWLCOMB15.
@PRT,S BWR.COMB15
@asg,ax NITAWLCOMB7.
@use 2,NITAWLCOMB7.
@asg,ax NITAWLCOMB8.
@USE 3,NITAWLCOMB8.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 30 A8 0 A11 0 E 1T
2$$ 2343589 2353589 2363589 2383589 2393589 2403589
    2413589 2423589 913589 1193589 563589 523589
    593589 163589 13589
    2343449 2353449 2363449 2383449 2393449 2403449
    2413449 2423449 913449 1193449 563449 523449
    593449 163449 13449
    2343310 2353310 2363310 2383310 2393310 2403310
    2413310 2423310 913310 1193310 563310 523310
    593310 163310 13310
    2343240 2353240 2363240 2383240 2393240 2403240
    2413240 2423240 913240 1193240 563240 523240
    593240 163240 13240
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB15.
@SYM,U COMB15.
@DELETE NITAWLCOMB7.
@DELETE NITAWLCOMB8.
@FIN

```


TABLE A.65. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB9 and COMB10 into One Library (COMB16)

```

@RUN COMB16/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB16.,///500
@ERS COMB16.
@BRKPT PRINT$/COMB16
@ASG,PU NITAWLCOMB16.,///500
@ERS NITAWLCOMB16.
@USE 4,NITAWLCOMB16.
@PRT,S BWR.COMB16
@asg,ax NITAWLCOMB9.
@use 2,NITAWLCOMB9.
@asg,ax NITAWLCOMB10.
@USE 3,NITAWLCOMB10.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 30 A8 0 A11 0 E 1T
2$$ 2343100 2353100 2363100 2383100 2393100 2403100
    2413100 2423100 913100 1193100 563100 523100
    593100 163100 13100
    2343031 2353031 2363031 2383031 2393031 2403031
    2413031 2423031 913031 1193031 563031 523031
    593031 163031 13031
    2342961 2352961 2362961 2382961 2392961 2402961
    2412961 2422961 912961 1192961 562961 522961
    592961 162961 12961
    2342891 2352891 2362891 2382891 2392891 2402891
    2412891 2422891 912891 1192891 562891 522891
    592891 162891 12891
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB16.
@SYM,U COMB16.
@DELETE NITAWLCOMB9.
@DELETE NITAWLCOMB10.
@FIN

```

TABLE A.66. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries for 0.6300 g/cc Water Density and Generated by COMB11 into One Library (COMB17)

```

@RUN COMB17/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB17.,///500
@ERS COMB17.
@BRKPT PRINT$/COMB17
@ASG,PU NITAWLCOMB17.,///500
@ERS NITAWLCOMB17.
@USE 4,NITAWLCOMB17.
@PRT,S BWR.COMB17
@asg,ax NITAWLCOMB11.
@use 2,NITAWLCOMB11.
@asg,ax PIN63003.
@USE 3,PIN63003.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 30 15 A8 0 A11 0 E 1T
2$$ 2342821 2352821 2362821 2382821 2392821 2402821
    2412821 2422821 912821 1192821 562821 522821
    592821 162821 12821
    2342751 2352751 2362751 2382751 2392751 2402751
    2412751 2422751 912751 1192751 562751 522751
    592751 162751 12751
    2346300 2356300 2366300 2386300 2396300 2406300
    2416300 2426300 916300 1196300 566300 526300
    596300 166300 16300
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB17.
@SYM,U COMB17.
@DELETE NITAWLCOMB11.
@DELETE PIN63003.
@FIN

```

TABLE A.67. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB12 and COMB13 into One Library (COMB18)

```

@RUN COMB18/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB18.,///500
@ERS COMB18.
@BRKPT PRINT$/COMB18
@ASG,PU NITAWLCOMB18.,///500
@ERS NITAWLCOMB18.
@USE 4,NITAWLCOMB18.
@PRT,S BWR.COMB18
@asg,ax NITAWLCOMB12.
@use 2,NITAWLCOMB12.
@asg,ax NITAWLCOMB13.
@USE 3,NITAWLCOMB13.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 60 60 A8 0 A11 0 E 1T
2$$ 2348600 2358600 2368600 2388600 2398600 2408600
    2418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
    2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
    2345404 2355404 2365404 2385404 2395404 2405404
    2415404 2425404 915404 1195404 565404 525404
    595404 165404 15404
    2344916 2354916 2364916 2384916 2394916 2404916
    2414916 2424916 914916 1194916 564916 524916
    594916 164916 14916
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB18.
@SYM,U COMB18.
@DELETE NITAWLCOMB12.
@DELETE NITAWLCOMB13.
@FIN

```

TABLE A.68. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated COMB14 and COMB15 into One Library (COMB19)

```

@RUN COMB19/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB19.,///500
@ERS COMB19.
@BRKPT PRINT$/COMB19
@ASG,PU NITAWLCOMB19.,///500
@ERS NITAWLCOMB19.
@USE 4,NITAWLCOMB19.
@PRT,S BWR.COMB19
@asg,ax NITAWLCOMB14.
@use 2,NITAWLCOMB14.
@asg,ax NITAWLCOMB15.
@USE 3,NITAWLCOMB15.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 60 60 A8 0 A11 0 E 1T
2$$ 2344567 2354567 2364567 2384567 2394567 2404567
    2414567 2424567 914567 1194567 564567 524567
    594567 164567 14567
    2344287 2354287 2364287 2384287 2394287 2404287
    2414287 2424287 914287 1194287 564287 524287
    594287 164287 14287
    2344008 2354008 2364008 2384008 2394008 2404008
    2414008 2424008 914008 1194008 564008 524008
    594008 164008 14008
    2343799 2353799 2363799 2383799 2393799 2403799
    2413799 2423799 913799 1193799 563799 523799
    593799 163799 13799
    2343589 2353589 2363589 2383589 2393589 2403589
    2413589 2423589 913589 1193589 563589 523589
    593589 163589 13589
    2343449 2353449 2363449 2383449 2393449 2403449
    2413449 2423449 913449 1193449 563449 523449
    593449 163449 13449
    2343310 2353310 2363310 2383310 2393310 2403310
    2413310 2423310 913310 1193310 563310 523310
    593310 163310 13310
    2343240 2353240 2363240 2383240 2393240 2403240
    2413240 2423240 913240 1193240 563240 523240
    593240 163240 13240
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB19.
@SYM,U COMB19.
@DELETE NITAWLCOMB14.
@DELETE NITAWLCOMB15.
@FIN

```

TABLE A.69. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB16 and COMB17 into One Library (COMB20)

```

@RUN COMB20/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB20.,///500
@ERS COMB20.
@BRKPT PRINT$/COMB20
@ASG,PU NITAWLCOMB20.,///500
@ERS NITAWLCOMB20.
@USE 4,NITAWLCOMB20.
@PRT,S BWR,COMB20
@asg,ax NITAWLCOMB16.
@use 2,NITAWLCOMB16.
@asg,ax NITAWLCOMB17.
@USE 3,NITAWLCOMB17.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
0$$ 1 E
1$$ 0 0 60 45 A8 0 A11 0 E 1T
2$$ 2343100 2353100 2363100 2383100 2393100 2403100
    2413100 2423100 913100 1193100 563100 523100
    593100 163100 13100
    2343031 2353031 2363031 2383031 2393031 2403031
    2413031 2423031 913031 1193031 563031 523031
    593031 163031 13031
    2342961 2352961 2362961 2382961 2392961 2402961
    2412961 2422961 912961 1192961 562961 522961
    592961 162961 12961
    2342891 2352891 2362891 2382891 2392891 2402891
    2412891 2422891 912891 1192891 562891 522891
    592891 162891 12891
    2342821 2352821 2362821 2382821 2392821 2402821
    2412821 2422821 912821 1192821 562821 522821
    592821 162821 12821
    2342751 2352751 2362751 2382751 2392751 2402751
    2412751 2422751 912751 1192751 562751 522751
    592751 162751 12751
    2346300 2356300 2366300 2386300 2396300 2406300
    2416300 2426300 916300 1196300 566300 526300
    596300 166300 16300
4** 8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559
    8R 1365 5R 566 2R 559 2T
@MSLIMIT
@BRKPT PRINT$
@FREE COMB20.
@SYM,U COMB20.
@DELETE NITAWLCOMB16.
@DELETE NITAWLCOMB17.
@FIN

```

TABLE A.70. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated by COMB18 and COMB19 into One Library (COMB21)

```

@RUN COMB21/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB21.,///500
@ERS COMB21.
@BRKPT PRINT$/COMB21
@ASG,PU NITAWLCOMB21.,///500
@ERS NITAWLCOMB21.
@USE 4,NITAWLCOMB21.
@PRT,S BWR.COMB21
@ASG,T 18,///1000
@ASG,T 19,///1000
@ASG,T 9,///1000
@asg,ax NITAWLCOMB18.
@use 2,NITAWLCOMB18.
@asg,ax NITAWLCOMB19.
@USE 3,NITAWLCOMB19.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 120 120 A8 0 A11 0 E 1T
2$$ 2348600 2358600 2368600 2388600 2398600 2408600
    2418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
    2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
    2345404 2355404 2365404 2385404 2395404 2405404
    2415404 2425404 915404 1195404 565404 525404
    595404 165404 15404
    2344916 2354916 2364916 2384916 2394916 2404916
    2414916 2424916 914916 1194916 564916 524916
    594916 164916 14916
    2344567 2354567 2364567 2384567 2394567 2404567
    2414567 2424567 914567 1194567 564567 524567
    594567 164567 14567

```

TABLE A.70. (contd)

2344287	2354287	2364287	2384287	2394287	2404287
2414287	2424287	914287	1194287	564287	524287
594287	164287	14287			
2344008	2354008	2364008	2384008	2394008	2404008
2414008	2424008	914008	1194008	564008	524008
594008	164008	14008			
2343799	2353799	2363799	2383799	2393799	2403799
2413799	2423799	913799	1193799	563799	523799
593799	163799	13799			
2343589	2353589	2363589	2383589	2393589	2403589
2413589	2423589	913589	1193589	563589	523589
593589	163589	13589			
2343449	2353449	2363449	2383449	2393449	2403449
2413449	2423449	913449	1193449	563449	523449
593449	163449	13449			
2343310	2353310	2363310	2383310	2393310	2403310
2413310	2423310	913310	1193310	563310	523310
593310	163310	13310			
2343240	2353240	2363240	2383240	2393240	2403240
2413240	2423240	913240	1193240	563240	523240
593240	163240	13240			
4**	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559		
	8R 1365	5R 566	2R 559	2T	
	@MSLIMIT				
	@BRKPT PRINT\$				
	@FREE COMB21.				
	@SYM,U COMB21.				
	@DELETE NITAWLCOMB18.				
	@DELETE NITAWLCOMB19.				
	@FIN				

TABLE A.71. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell Cross Section Libraries Generated COMB20 and COMB21 into One Library (COMB22)

```

@RUN COMB22/250/1//,PNL299/SMS299,SHORT,30,500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB22.,///500
@ERS COMB22.
@BRKPT PRINT$/COMB22
@ASG,PU NITAWLCOMB22.,///500
@ERS NITAWLCOMB22.
@USE 4,NITAWLCOMB22.
@PRT,S BWR.COMB22
@asg,ax NITAWLCOMB21.
@use 2,NITAWLCOMB21.
@asg,ax NITAWLCOMB20.
@USE 3,NITAWLCOMB20.
@ASG,T 18,///1000
@ASG,T 19,///1000
@ASG,T 9,///1000
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 1 E
1$$ 0 0 240 105 A8 0 A11 0 E 1T
2$$ 2348600 2358600 2368600 2388600 2398600 2408600
    2418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
    2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
    2345404 2355404 2365404 2385404 2395404 2405404
    2415404 2425404 915404 1195404 565404 525404
    595404 165404 15404
    2344916 2354916 2364916 2384916 2394916 2404916
    2414916 2424916 914916 1194916 564916 524916
    594916 164916 14916
    2344567 2354567 2364567 2384567 2394567 2404567
    2414567 2424567 914567 1194567 564567 524567
    594567 164567 14567

```


TABLE A.71. (contd)

2344287	2354287	2364287	2384287	2394287	2404287
2414287	2424287	914287	1194287	564287	524287
594287	164287	14287			
2344008	2354008	2364008	2384008	2394008	2404008
2414008	2424008	914008	1194008	564008	524008
594008	164008	14008			
2343799	2353799	2363799	2383799	2393799	2403799
2413799	2423799	913799	1193799	563799	523799
593799	163799	13799			
2343589	2353589	2363589	2383589	2393589	2403589
2413589	2423589	913589	1193589	563589	523589
593589	163589	13589			
2343449	2353449	2363449	2383449	2393449	2403449
2413449	2423449	913449	1193449	563449	523449
593449	163449	13449			
2343310	2353310	2363310	2383310	2393310	2403310
2413310	2423310	913310	1193310	563310	523310
593310	163310	13310			
2343240	2353240	2363240	2383240	2393240	2403240
2413240	2423240	913240	1193240	563240	523240
593240	163240	13240			
2343100	2353100	2363100	2383100	2393100	2403100
2413100	2423100	913100	1193100	563100	523100
593100	163100	13100			
2343031	2353031	2363031	2383031	2393031	2403031
2413031	2423031	913031	1193031	563031	523031
593031	163031	13031			
2342961	2352961	2362961	2382961	2392961	2402961
2412961	2422961	912961	1192961	562961	522961
592961	162961	12961			
2342891	2352891	2362891	2382891	2392891	2402891
2412891	2422891	912891	1192891	562891	522891
592891	162891	12891			
2342821	2352821	2362821	2382821	2392821	2402821
2412821	2422821	912821	1192821	562821	522821
592821	162821	12821			
2342751	2352751	2362751	2382751	2392751	2402751
2412751	2422751	912751	1192751	562751	522751
592751	162751	12751			
2346300	2356300	2366300	2386300	2396300	2406300
2416300	2426300	916300	1196300	566300	526300
596300	166300	16300			
4** 8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			
8R 1365	5R 566	2R 559			

TABLE A.71. (contd)

8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	
8R	1365	5R	566	2R	559	2T

@MSLIMIT
 @BRKPT PRINT\$
 @FREE COMB22.
 @SYM,U COMB22.
 @DELETE NITAWLCOMB21.
 @DELETE NITAWLCOMB20.
 @FIN

TABLE A.72. NITAWL Input Used to Combine General Electric Fuel Assembly Pin Cell and Control Cell Cross Sections into One Master Cross Section Library (COMB23)

```

@RUN COMB23/250/1//,PNL299/SMS299,SHORT,30,1500 .
@IDENT . M SCHUTZ/SIGMA3
@ASG,pu COMB23.,///1000
@ERS COMB23.
@BRKPT PRINT$/COMB23
@ASG,PU BWRGIPLIB.,///1000
@USE 7,BWRGIPLIB.
@ASG,PU NITAWLCOMB23.,///500
@ERS NITAWLCOMB23.
@USE 4,NITAWLCOMB23.
@PRT,S BWR.COMB23
@asg,ax NITAWLCOMB22.
@use 2,NITAWLCOMB22.
@asg,ax PINCONTRL.
@USE 3,PINCONTRL.
@ASG,T 18,///1000
@ASG,T 19,///1000
@ASG,T 9,///1000
@ASG,A CIL*CMLIB.
@USE 60,CIL*CMLIB.
@ASG,A UPJ*NITAWLPROG.
@XQT UPJ*NITAWLPROG.
O$$ 60 E
1$$ 3 18 345 8 1 13 14 0 40 3R 0 1T
2$$ 1286 1193 128702 1199 1189
    1276 1269 714102 119503 1128
    1149 703903 127303 119202 119002
    119102 119702 1275
    2348600 2358600 2368600 2388600 2398600 2408600
    2418600 2428600 918600 1198600 568600 528600
    598600 168600 18600
    2347359 2357359 2367359 2387359 2397359 2407359
    2417359 2427359 917359 1197359 567359 527359
    597359 167359 17359
    2347220 2357220 2367220 2387220 2397220 2407220
    2417220 2427220 917220 1197220 567220 527220
    597220 167220 17220
    2346940 2356940 2366940 2386940 2396940 2406940
    2416940 2426940 916940 1196940 566940 526940
    596940 166940 16940
    2346452 2356452 2366452 2386452 2396452 2406452
    2416452 2426452 916452 1196452 566452 526452
    596452 166452 16452
    2345893 2355893 2365893 2385893 2395893 2405893
    2415893 2425893 915893 1195893 565893 525893
    595893 165893 15893
    2345404 2355404 2365404 2385404 2395404 2405404

```

TABLE A.72. (contd)

2415404	2425404	915404	1195404	565404	525404
595404	165404	15404			
2344916	2354916	2364916	2384916	2394916	2404916
2414916	2424916	914916	1194916	564916	524916
594916	164916	14916			
2344567	2354567	2364567	2384567	2394567	2404567
2414567	2424567	914567	1194567	564567	524567
594567	164567	14567			
2344287	2354287	2364287	2384287	2394287	2404287
2414287	2424287	914287	1194287	564287	524287
594287	164287	14287			
2344008	2354008	2364008	2384008	2394008	2404008
2414008	2424008	914008	1194008	564008	524008
594008	164008	14008			
2343799	2353799	2363799	2383799	2393799	2403799
2413799	2423799	913799	1193799	563799	523799
593799	163799	13799			
2343589	2353589	2363589	2383589	2393589	2403589
2413589	2423589	913589	1193589	563589	523589
593589	163589	13589			
2343449	2353449	2363449	2383449	2393449	2403449
2413449	2423449	913449	1193449	563449	523449
593449	163449	13449			
2343310	2353310	2363310	2383310	2393310	2403310
2413310	2423310	913310	1193310	563310	523310
593310	163310	13310			
2343240	2353240	2363240	2383240	2393240	2403240
2413240	2423240	913240	1193240	563240	523240
593240	163240	13240			
2343100	2353100	2363100	2383100	2393100	2403100
2413100	2423100	913100	1193100	563100	523100
593100	163100	13100			
2343031	2353031	2363031	2383031	2393031	2403031
2413031	2423031	913031	1193031	563031	523031
593031	163031	13031			
2342961	2352961	2362961	2382961	2392961	2402961
2412961	2422961	912961	1192961	562961	522961
592961	162961	12961			
2342891	2352891	2362891	2382891	2392891	2402891
2412891	2422891	912891	1192891	562891	522891
592891	162891	12891			
2342821	2352821	2362821	2382821	2392821	2402821
2412821	2422821	912821	1192821	562821	522821
592821	162821	12821			
2342751	2352751	2362751	2382751	2392751	2402751
2412751	2422751	912751	1192751	562751	522751
592751	162751	12751			
2346300	2356300	2366300	2386300	2396300	2406300
2416300	2426300	916300	1196300	566300	526300

TABLE A.72. (contd)

[illegible]

TABLE A.73. GIP Input for the General Electric Reactor Model

1\$\$	27	13	14	40	2293	1493	0	2026	0	3	2	2	0	A15	10	E
T																
10\$\$	1494	1495	1496	1497	4Q4	1498	1499	1500	1501	4Q4						
	1502	1503	1504	1505	4Q4	1506	1507	1508	1509	4Q4						
	1510	1511	1512	1513	4Q4	1514	1515	1516	1517	4Q4						
	1518	1519	1520	1521	4Q4	1522	1523	1524	1525	4Q4						
	1526	1527	1528	1529	4Q4	1530	1531	1532	1533	4Q4						
	1534	1535	1536	1537	4Q4	1538	1539	1540	1541	4Q4						
	1542	1543	1544	1545	4Q4	1546	1547	1548	1549	4Q4						
	1550	1551	1552	1553	4Q4	1554	1555	1556	1557	4Q4						
	1558	1559	1560	1561	4Q4	1562	1563	1564	1565	4Q4						
	1566	1567	1568	1569	4Q4	1570	1571	1572	1573	4Q4						
	1574	1575	1576	1577	4Q4	1578	1579	1580	1581	4Q4						
	1582	1583	1584	1585	4Q4	1586	1587	1588	1589	9Q4						
	1590	1591	1592	1593	9Q4	1594	1595	1596	1597	9Q4						
	1598	1599	1600	1601	9Q4	1602	1603	1604	1605	9Q4						
	1606	1607	1608	1609	9Q4	1610	1611	1612	1613	9Q4						
	1614	1615	1616	1617	9Q4	1618	1619	1620	1621	9Q4						
	1622	1623	1624	1625	9Q4	1626	1627	1628	1629	9Q4						
	1630	1631	1632	1633	9Q4	1634	1635	1636	1637	9Q4						
	1638	1639	1640	1641	9Q4	1642	1643	1644	1645	9Q4						
	1646	1647	1648	1649	9Q4	1650	1651	1652	1653	9Q4						
	1654	1655	1656	1657	9Q4	1658	1659	1660	1661	9Q4						
	1662	1663	1664	1665	9Q4	1666	1667	1668	1669	9Q4						
	1670	1671	1672	1673	9Q4	1674	1675	1676	1677	9Q4						
	1678	1679	1680	1681	1Q4	1682	1683	1684	1685	1Q4						
	1686	1687	1688	1689	1Q4	1690	1691	1692	1693	1Q4						
	1694	1695	1696	1697	1Q4	1698	1699	1700	1701	1Q4						
	1702	1703	1704	1705	1Q4	1706	1707	1708	1709	1Q4						
	1710	1711	1712	1713	1Q4	1714	1715	1716	1717	1Q4						
	1718	1719	1720	1721	1Q4	1722	1723	1724	1725	1Q4						
	1726	1727	1728	1729	1Q4	1730	1731	1732	1733	1Q4						
	1734	1735	1736	1737	1Q4	1738	1739	1740	1741	1Q4						
	1742	1743	1744	1745	1Q4	1746	1747	1748	1749	1Q4						
	1750	1751	1752	1753	1Q4	1754	1755	1756	1757	1Q4						
	1758	1759	1760	1761	1Q4	1762	1763	1764	1765	1Q4						
	1766	1767	1768	1769	1Q4	1770	1771	1772	1773	4Q4						
	1774	1775	1776	1777	2Q4	1778	1779	1780	1781	7Q4						
	1782	1783	1784	1785	7Q4	1786	1787	1788	1789	1Q4						
	1790	1791	1792	1793	2Q4	1794	1795	1796	1797	2Q4						
	1798	1799	1800	1801	2Q4	1802	1803	1804	1805	2Q4						
	1806	1807	1808	1809	4Q4	1810	1811	1812	1813	3Q4						
	1814	1815	1816	1817	2Q4	1818	1819	1820	1821	2Q4						
	1822	1823	1824	1825	2Q4	1826	1827	1828	1829	3Q4						
	1830	1831	1832	1833	2Q4	1834	1835	1836	1837	2Q4						
	1838	1839	1840	1841	2Q4	1842	1843	1844	1845	3Q4						
	1846	1847	1848	1849	2Q4	1850	1851	1852	1853	2Q4						
	1854	1855	1856	1857	2Q4	1858	1859	1860	1861	3Q4						

TABLE A.73. (contd)

1862	1863	1864	1865	2Q4	1866	1867	1868	1869	2Q4
1870	1871	1872	1873	2Q4	1874	1875	1876	1877	3Q4
1878	1879	1880	1881	2Q4	1882	1883	1884	1885	2Q4
1886	1887	1888	1889	2Q4	1890	1891	1892	1893	3Q4
1894	1895	1896	1897	2Q4	1898	1899	1900	1901	2Q4
1902	1903	1904	1905	2Q4	1906	1907	1908	1909	3Q4
1910	1911	1912	1913	2Q4	1914	1915	1916	1917	2Q4
1918	1919	1920	1921	2Q4	1922	1923	1924	1925	2Q4
1926	1927	1928	1929	3Q4	1930	1931	1932	1933	2Q4
1934	1935	1936	1937	2Q4	1938	1939	1940	1941	2Q4
1942	1943	1944	1945	2Q4	1946	1947	1948	1949	2Q4
1950	1951	1952	1953	2Q4	1954	1955	1956	1957	2Q4
1958	1959	1960	1961	1Q4	1962	1963	1964	1965	
1966	1967	1968	1969	1Q4	1970	1971	1972	1973	1Q4
51I	1974	2026							
11\$\$									
'	Zircalloy (Zr-2 @ 0.8600 g/cc H2O)				(1494	1495	1496	1497)	
2I	81 84 141 105 120								
'	Zircalloy (Zr-2 @ 0.7359 g/cc H2O)				(1498	1499	1500	1501)	
2I	141 144 141 165 180								
'	Zircalloy (Zr-2 @ 0.7220 g/cc H2O)				(1502	1503	1504	1505)	
2I	201 204 141 225 240								
'	Zircalloy (Zr-2 @ 0.6940 g/cc H2O)				(1506	1507	1508	1509)	
2I	261 264 141 285 300								
'	Zircalloy (Zr-2 @ 0.6452 g/cc H2O)				(1510	1511	1512	1513)	
2I	321 324 141 345 360								
'	Zircalloy (Zr-2 @ 0.5893 g/cc H2O)				(1514	1515	1516	1517)	
2I	381 384 141 405 420								
'	Zircalloy (Zr-2 @ 0.5404 g/cc H2O)				(1518	1519	1520	1521)	
2I	441 444 141 465 480								
'	Zircalloy (Zr-2 @ 0.4916 g/cc H2O)				(1522	1523	1524	1525)	
2I	501 504 141 525 540								
'	Zircalloy (Zr-2 @ 0.4567 g/cc H2O)				(1526	1527	1528	1529)	
2I	561 564 141 585 600								
'	Zircalloy (Zr-2 @ 0.4287 g/cc H2O)				(1530	1531	1532	1533)	
2I	621 624 141 645 660								
'	Zircalloy (Zr-2 @ 0.4008 g/cc H2O)				(1534	1535	1536	1537)	
2I	681 684 141 705 720								
'	Zircalloy (Zr-2 @ 0.3799 g/cc H2O)				(1538	1539	1540	1541)	
2I	741 744 141 765 780								
'	Zircalloy (Zr-2 @ 0.3589 g/cc H2O)				(1542	1543	1544	1545)	
2I	801 804 141 825 840								
'	Zircalloy (Zr-2 @ 0.3449 g/cc H2O)				(1546	1547	1548	1549)	
2I	861 864 141 885 900								
'	Zircalloy (Zr-2 @ 0.3310 g/cc H2O)				(1550	1551	1552	1553)	
2I	921 924 141 945 960								
'	Zircalloy (Zr-2 @ 0.3240 g/cc H2O)				(1554	1555	1556	1557)	
2I	981 984 141 1005 1020								

TABLE A.73. (contd)

'	Zircalloy (Zr-2 @ 0.3100 g/cc H2O)	(1558 1559 1560 1561)
21	1041 1044 141 1065 1080	
'	Zircalloy (Zr-2 @ 0.3031 g/cc H2O)	(1562 1563 1564 1565)
21	1101 1104 141 1125 1140	
'	Zircalloy (Zr-2 @ 0.2961 g/cc H2O)	(1566 1567 1568 1569)
21	1161 1164 141 1185 1200	
'	Zircalloy (Zr-2 @ 0.2891 g/cc H2O)	(1570 1571 1572 1573)
21	1221 1224 141 1245 1260	
'	Zircalloy (Zr-2 @ 0.2821 g/cc H2O)	(1574 1575 1576 1577)
21	1281 1284 141 1305 1320	
'	Zircalloy (Zr-2 @ 0.2751 g/cc H2O)	(1578 1579 1580 1581)
21	1341 1344 141 1365 1380	
'	Zircalloy (Zr-2 @ 0.6300 g/cc H2O)	(1582 1583 1584 1585)
21	1401 1404 141 1425 1440	
'	15000 Mwd/MTU fuel (@ 0.8600 g/cc H2O)	(1586 1587 1588 1589)
181	85 104 101 121 132 21 73	76
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.7359 g/cc H2O)	(1590 1591 1592 1593)
181	145 164 101 181 192 21 133	136
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.7220 g/cc H2O)	(1594 1595 1596 1597)
181	205 224 101 241 252 21 193	196
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.6940 g/cc H2O)	(1598 1599 1600 1601)
181	265 284 101 301 312 21 253	256
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.6452 g/cc H2O)	(1602 1603 1604 1605)
181	325 344 101 361 372 21 313	316
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.5893 g/cc H2O)	(1606 1607 1608 1609)
181	385 404 101 421 432 21 373	376
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.5404 g/cc H2O)	(1610 1611 1612 1613)
181	445 464 101 481 492 21 433	436
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.4916 g/cc H2O)	(1614 1615 1616 1617)
181	505 524 101 541 552 21 493	496
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.4567 g/cc H2O)	(1618 1619 1620 1621)
181	565 584 101 601 612 21 553	556
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.4287 g/cc H2O)	(1622 1623 1624 1625)
181	625 644 101 661 672 21 613	616
21	41 44	
'	15000 Mwd/MTU fuel (@ 0.4008 g/cc H2O)	(1626 1627 1628 1629)
181	685 704 101 721 732 21 673	676
21	41 44	

TABLE A.73. (contd)

'	15000 MWd/MTU	fuel	(@ 0.3799 g/cc H ₂ O)	(1630 1631 1632 1633)
18I	745 764	10I	781 792	2I 733 736
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3589 g/cc H ₂ O)	(1634 1635 1636 1637)
18I	805 824	10I	841 852	2I 793 796
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3449 g/cc H ₂ O)	(1638 1639 1640 1641)
18I	865 884	10I	901 912	2I 853 856
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3310 g/cc H ₂ O)	(1642 1643 1644 1645)
18I	925 944	10I	961 972	2I 913 916
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3240 g/cc H ₂ O)	(1646 1647 1648 1649)
18I	985 1004	10I	1021 1032	2I 973 976
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3100 g/cc H ₂ O)	(1650 1651 1652 1653)
18I	1045 1064	10I	1081 1092	2I 1033 1036
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.3031 g/cc H ₂ O)	(1654 1655 1656 1657)
18I	1105 1124	10I	1141 1152	2I 1093 1096
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.2961 g/cc H ₂ O)	(1658 1659 1660 1661)
18I	1165 1184	10I	1201 1212	2I 1153 1156
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.2891 g/cc H ₂ O)	(1662 1663 1664 1665)
18I	1225 1244	10I	1261 1272	2I 1213 1216
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.2821 g/cc H ₂ O)	(1666 1667 1668 1669)
18I	1285 1304	10I	1321 1332	2I 1273 1276
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.2751 g/cc H ₂ O)	(1670 1671 1672 1673)
18I	1345 1364	10I	1381 1392	2I 1333 1336
2I	41 44			
'	15000 MWd/MTU	fuel	(@ 0.6300 g/cc H ₂ O)	(1674 1675 1676 1677)
18I	1405 1424	10I	1441 1452	2I 1393 1396
2I	41 44			
'	H ₂ O Moderator	(@ 0.8600 g/cc)		(1678 1679 1680 1681)
6I	73 80			
'	H ₂ O Moderator	(@ 0.7359 g/cc)		(1682 1683 1684 1685)
6I	133 140			
'	H ₂ O Moderator	(@ 0.7220 g/cc)		(1686 1687 1688 1689)
6I	193 200			
'	H ₂ O Moderator	(@ 0.6940 g/cc)		(1690 1691 1692 1693)
6I	253 260			
'	H ₂ O Moderator	(@ 0.6452 g/cc)		(1694 1695 1696 1697)
6I	313 320			
'	H ₂ O Moderator	(@ 0.5893 g/cc)		(1698 1699 1700 1701)
6I	373 380			

TABLE A.73. (contd)

' H2O Moderator (@ 0.5404 g/cc)	(1702 1703 1704 1705)
6I 433 440	
' H2O Moderator (@ 0.4916 g/cc)	(1706 1707 1708 1709)
6I 493 500	
' H2O Moderator (@ 0.4567 g/cc)	(1710 1711 1712 1713)
6I 553 560	
' H2O Moderator (@ 0.4287 g/cc)	(1714 1715 1716 1717)
6I 613 620	
' H2O Moderator (@ 0.4008 g/cc)	(1718 1719 1720 1721)
6I 673 680	
' H2O Moderator (@ 0.3799 g/cc)	(1722 1723 1724 1725)
6I 733 740	
' H2O Moderator (@ 0.3589 g/cc)	(1726 1727 1728 1729)
6I 793 800	
' H2O Moderator (@ 0.3449 g/cc)	(1730 1731 1732 1733)
6I 853 860	
' H2O Moderator (@ 0.3310 g/cc)	(1734 1735 1736 1737)
6I 913 920	
' H2O Moderator (@ 0.3240 g/cc)	(1738 1739 1740 1741)
6I 973 980	
' H2O Moderator (@ 0.3100 g/cc)	(1742 1743 1744 1745)
6I 1033 1040	
' H2O Moderator (@ 0.3031 g/cc)	(1746 1747 1748 1749)
6I 1093 1100	
' H2O Moderator (@ 0.2961 g/cc)	(1750 1751 1752 1753)
6I 1153 1160	
' H2O Moderator (@ 0.2891 g/cc)	(1754 1755 1756 1757)
6I 1213 1220	
' H2O Moderator (@ 0.2821 g/cc)	(1758 1759 1760 1761)
6I 1273 1280	
' H2O Moderator (@ 0.2751 g/cc)	(1762 1763 1764 1765)
6I 1333 1340	
' H2O Moderator (@ 0.6300 g/cc)	(1766 1767 1768 1769)
6I 1393 1400	
' Stainless Steel (SS-304)	(1770 1771 1772 1773)
2I 1453 1456 14I 1469 1484	
' Control Rod Alloy (B4C)	(1774 1775 1776 1777)
10I 1457 1468	
' Inconel (INC-718)	(1778 1779 1780 1781)
10I 25 36 14I 45 60 2I 69 72	
' Inconel (INC-750)	(1782 1783 1784 1785)
10I 25 36 14I 49 64 2I 69 72	
' Region 1 (L. H2O Refl./CR Guide Tubes)	(1786 1787 1788 1789)
2I 1678 1681 2I 1770 1773	
' Region 2 (L. H2O Refl./CR Guide Tubes)	(1790 1791 1792 1793)
2I 1678 1681 2I 1770 1773 2I 1774 1777	
' Region 3 (L. Flow Orifice)	(1794 1795 1796 1797)
2I 1678 1681 2I 1770 1773 2I 1774 1777	

TABE A.73. (contd)

'	Region 4 (L. Core Support Plate)	(1798 1799 1800 1801)
	2I 1678 1681 2I 1770 1773 2I 1774 1777	
'	Region 5 (L. Nose Piece and Orifice)	(1802 1803 1804 1805)
	2I 1678 1681 2I 1770 1773 2I 1774 1777	
'	Region 6 (L. Tie Plate/Finger Springs)	(1806 1807 1808 1809)
	2I 1678 1681 2I 1770 1773 2I 1774 1777	
	2I 1494 1497 2I 1778 1781	
'	Region 7 (L. End Plugs)	(1810 1811 1812 1813)
	2I 1678 1681 2I 1770 1773 2I 1774 1777	
	2I 1494 1497	
'	Region 8 (U02 @ 0.7359 g/cc H2O)	(1814 1815 1816 1817)
	2I 1682 1685 2I 1498 1501 2I 1590 1593	
'	Region 9 (U02 @ 0.7359 g/cc H2O)	(1818 1819 1820 1821)
	2I 1682 1685 2I 1498 1501 2I 1590 1593	
'	Region 10 (U02 @ 0.7220 g/cc H2O)	(1822 1823 1824 1825)
	2I 1686 1689 2I 1502 1505 2I 1594 1597	
'	Region 11 (U02 @ 0.7220 g/cc H2O/spacer)	(1826 1827 1828 1829)
	2I 1686 1689 2I 1502 1505 2I 1594 1597	
	2I 1778 1781	
'	Region 12 (U02 @ 0.6940 g/cc H2O)	(1830 1831 1832 1833)
	2I 1690 1693 2I 1506 1509 2I 1598 1601	
'	Region 13 (U02 @ 0.6452 g/cc H2O)	(1834 1835 1836 1837)
	2I 1694 1697 2I 1510 1513 2I 1602 1605	
'	Region 14 (U02 @ 0.5893 g/cc H2O)	(1838 1839 1840 1841)
	2I 1698 1701 2I 1514 1517 2I 1606 1609	
'	Region 15 (U02 @ 0.5893 g/cc H2O/spacer)	(1842 1843 1844 1845)
	2I 1698 1701 2I 1514 1517 2I 1606 1609	
	2I 1778 1781	
'	Region 16 (U02 @ 0.5404 g/cc H2O)	(1846 1847 1848 1849)
	2I 1702 1705 2I 1518 1521 2I 1610 1613	
'	Region 17 (U02 @ 0.4916 g/cc H2O)	(1850 1851 1852 1853)
	2I 1706 1709 2I 1522 1525 2I 1614 1617	
'	Region 18 (U02 @ 0.4567 g/cc H2O)	(1854 1855 1856 1857)
	2I 1710 1713 2I 1526 1529 2I 1618 1621	
'	Region 19 (U02 @ 0.4567 g/cc H2O/spacer)	(1858 1859 1860 1861)
	2I 1710 1713 2I 1526 1529 2I 1618 1621	
	2I 1778 1781	
'	Region 20 (U02 @ 0.4287 g/cc H2O)	(1862 1863 1864 1865)
	2I 1714 1717 2I 1530 1533 2I 1622 1625	
'	Region 21 (U02 @ 0.4008 g/cc H2O)	(1866 1867 1868 1869)
	2I 1718 1721 2I 1534 1537 2I 1626 1629	
'	Region 22 (U02 @ 0.3799 g/cc H2O)	(1870 1871 1872 1873)
	2I 1722 1725 2I 1538 1541 2I 1630 1633	
'	Region 23 (U02 @ 0.3799 g/cc H2O/spacer)	(1874 1875 1876 1877)
	2I 1722 1725 2I 1538 1541 2I 1630 1633	
	2I 1778 1781	
'	Region 24 (U02 @ 0.3589 g/cc H2O)	(1878 1879 1880 1881)
	2I 1726 1729 2I 1542 1545 2I 1634 1637	

TABLE A.73. (contd)

'	Region 25 (U02 @ 0.3449 g/cc H2O)	(1882 1883 1884 1885)
	2I 1730 1733 2I 1546 1549 2I 1638 1641	
'	Region 26 (U02 @ 0.3310 g/cc H2O)	(1886 1887 1888 1889)
	2I 1734 1737 2I 1550 1553 2I 1642 1645	
'	Region 27 (U02 @ 0.3310 g/cc H2O/spacer)	(1890 1891 1892 1893)
	2I 1734 1737 2I 1550 1553 2I 1642 1645	
	2I 1778 1781	
'	Region 28 (U02 @ 0.3240 g/cc H2O)	(1894 1895 1896 1897)
	2I 1738 1741 2I 1554 1557 2I 1646 1649	
'	Region 29 (U02 @ 0.3100 g/cc H2O)	(1898 1899 1900 1901)
	2I 1742 1745 2I 1558 1561 2I 1650 1653	
'	Region 30 (U02 @ 0.3031 g/cc H2O)	(1902 1903 1904 1905)
	2I 1746 1749 2I 1562 1565 2I 1654 1657	
'	Region 31 (U02 @ 0.3031 g/cc H2O/spacer)	(1906 1907 1908 1909)
	2I 1746 1749 2I 1562 1565 2I 1654 1657	
	2I 1778 1781	
'	Region 32 (U02 @ 0.2961 g/cc H2O)	(1910 1911 1912 1913)
	2I 1750 1753 2I 1566 1569 2I 1658 1661	
'	Region 33 (U02 @ 0.2891 g/cc H2O)	(1914 1915 1916 1917)
	2I 1754 1757 2I 1570 1573 2I 1662 1665	
'	Region 34 (U02 @ 0.2891 g/cc H2O)	(1918 1919 1920 1921)
	2I 1754 1757 2I 1570 1573 2I 1662 1665	
'	Region 35 (U02 @ 0.2821 g/cc H2O)	(1922 1923 1924 1925)
	2I 1758 1761 2I 1574 1577 2I 1666 1669	
'	Region 36 (U02 @ 0.2821 g/cc H2O/spacer)	(1926 1927 1928 1929)
	2I 1758 1761 2I 1574 1577 2I 1666 1669	
	2I 1778 1781	
'	Region 37 (U02 @ 0.2821 g/cc H2O)	(1930 1931 1932 1933)
	2I 1758 1761 2I 1574 1577 2I 1666 1669	
'	Region 38 (U02 @ 0.2751 g/cc H2O)	(1934 1935 1936 1937)
	2I 1762 1765 2I 1578 1581 2I 1670 1673	
'	Region 39 (U. Gas Plenum/Plenum Springs)	(1938 1939 1940 1941)
	2I 1762 1765 2I 1578 1591 2I 1782 1785	
'	Region 40 (U. End Plugs)	(1942 1943 1944 1945)
	2I 1762 1765 2I 1578 1591 2I 1782 1785	
'	Region 41 (U. End Pins/Springs)	(1946 1947 1948 1949)
	2I 1762 1765 2I 1578 1591 2I 1782 1785	
'	Region 42 (U. Tie Plate)	(1950 1951 1952 1953)
	2I 1762 1765 2I 1770 1773 2I 1578 1591	
'	Region 43 (U. Fuel Guide)	(1954 1955 1956 1957)
	2I 1762 1765 2I 1770 1773 2I 1578 1591	
'	Region 44 (U. Handle)	(1958 1959 1960 1961)
	2I 1762 1765 2I 1770 1773	
'	Region 45 (U. Steam Dome)	(1962 1963 1964 1965)
	2I 1762 1765	
'	Region 46 (U. Shroud Head Plate)	(1966 1967 1968 1969)
	2I 1762 1765 2I 1770 1773	
'	Region 47 (U. H2O Refl./Stm Sep. Risers)	(1970 1971 1972 1973)
	2I 1766 1769 2I 1770 1773	

TABLE A.73. (contd)

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' Activity Cross Sections from NITAWL/XSDRNPM
  2I  41  44    2I  17  20    2I  29  32
  2I  65  68    2I  33  36    2I  13  16
  2I  21  24    2I  53  56    2I  49  52
  2I   9  12    2I  45  48
' Nine Activity Cross Sections Sets (Input)
  7I 1485 1493
12**
' Zircalloy (Zr-2 @ .8600 g/cc H2O)      Output Material   1
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .7359 g/cc H2O)      Output Material   5
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .7220 g/cc H2O)      Output Material   9
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .6940 g/cc H2O)      Output Material  13
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .6452 g/cc H2O)      Output Material  17
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .5893 g/cc H2O)      Output Material  21
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .5404 g/cc H2O)      Output Material  25
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .4916 g/cc H2O)      Output Material  29
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .4567 g/cc H2O)      Output Material  33
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .4287 g/cc H2O)      Output Material  37
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .4008 g/cc H2O)      Output Material  41
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .3799 g/cc H2O)      Output Material  45
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5
' Zircalloy (Zr-2 @ .3589 g/cc H2O)      Output Material  49
  4R 4.29175-2  4R 4.81890-4  4R 1.48325-4  4R 4.03119-5
  4R 7.58620-5

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TABLE A.73. (contd)

' Zircalloy (Zr-2 @ .3449 g/cc H2O)	Output Material	53
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .3310 g/cc H2O)	Output Material	57
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .3240 g/cc H2O)	Output Material	61
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .3100 g/cc H2O)	Output Material	65
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .3031 g/cc H2O)	Output Material	69
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .2961 g/cc H2O)	Output Material	73
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .2891 g/cc H2O)	Output Material	77
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .2821 g/cc H2O)	Output Material	81
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .2751 g/cc H2O)	Output Material	85
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' Zircalloy (Zr-2 @ .6300 g/cc H2O)	Output Material	89
4R 4.29175-2 4R 4.81890-4 4R 1.48325-4 4R 4.03119-5		
4R 7.58620-5		
' 15000 MWd/MTU fuel (@ 0.8600 g/cc H2O)	Output Material	93
4R 3.06227-4 4R 2.52656-2 4R 2.76739-6 4R 5.72069-5		
4R 1.31331-8 4R 1.11253-4 4R 3.15685-5 4R 1.61119-5		
4R 4.61963-2 4R 3.98514-6		
' 15000 MWd/MTU fuel (@ 0.7359 g/cc H2O)	Output Material	97
4R 3.06227-4 4R 2.52656-2 4R 2.76739-6 4R 5.72069-5		
4R 1.31331-8 4R 1.11253-4 4R 3.15685-5 4R 1.61119-5		
4R 4.61963-2 4R 3.98514-6		
' 15000 MWd/MTU fuel (@ 0.7220 g/cc H2O)	Output Material	101
4R 3.06227-4 4R 2.52656-2 4R 2.76739-6 4R 5.72069-5		
4R 1.31331-8 4R 1.11253-4 4R 3.15685-5 4R 1.61119-5		
4R 4.61963-2 4R 3.98514-6		
' 15000 MWd/MTU fuel (@ 0.6940 g/cc H2O)	Output Material	105
4R 3.06227-4 4R 2.52656-2 4R 2.76739-6 4R 5.72069-5		
4R 1.31331-8 4R 1.11253-4 4R 3.15685-5 4R 1.61119-5		
4R 4.61963-2 4R 3.98514-6		

TABLE A.73. (contd)

'	15000 MWd/MTU fuel (@ 0.6452 g/cc H ₂ O)	Output Material	109
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.5893 g/cc H ₂ O)	Output Material	113
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.5404 g/cc H ₂ O)	Output Material	117
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.4916 g/cc H ₂ O)	Output Material	121
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.4567 g/cc H ₂ O)	Output Material	125
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.4287 g/cc H ₂ O)	Output Material	129
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.4008 g/cc H ₂ O)	Output Material	133
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3799 g/cc H ₂ O)	Output Material	137
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3589 g/cc H ₂ O)	Output Material	141
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3449 g/cc H ₂ O)	Output Material	145
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3310 g/cc H ₂ O)	Output Material	149
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3240 g/cc H ₂ O)	Output Material	153
4R	3.06227-4	4R 2.52656-2 4R 2.76739-6 4R 5.72069-5	
4R	1.31331-8	4R 1.11253-4 4R 3.15685-5 4R 1.61119-5	
4R	4.61963-2	4R 3.98514-6	
'	15000 MWd/MTU fuel (@ 0.3100 g/cc H ₂ O)	Output Material	157

TABLE A.73. (contd)

4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.3031 g/cc H ₂ O)	Output Material	161		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.2961 g/cc H ₂ O)	Output Material	165		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.2891 g/cc H ₂ O)	Output Material	169		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.2821 g/cc H ₂ O)	Output Material	173		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.2751 g/cc H ₂ O)	Output Material	177		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' 15000 MWd/MTU fuel (@ 0.6300 g/cc H ₂ O)	Output Material	181		
4R 3.06227-4	4R 2.52656-2	4R 2.76739-6	4R 5.72069-5	
4R 1.31331-8	4R 1.11253-4	4R 3.15685-5	4R 1.61119-5	
4R 4.61963-2	4R 3.98514-6			
' H ₂ O (@ 0.8600 g/cc)	Output Material	185		
4R 2.87481-2	4R 5.74962-2			
' H ₂ O (@ 0.7359 g/cc)	Output Material	189		
4R 2.45997-2	4R 4.91993-2			
' H ₂ O (@ 0.7220 g/cc)	Output Material	193		
4R 2.41350-2	4R 4.82700-2			
' H ₂ O (@ 0.6940 g/cc)	Output Material	197		
4R 2.31990-2	4R 4.63981-2			
' H ₂ O (@ 0.6452 g/cc)	Output Material	201		
4R 2.15677-2	4R 4.31355-2			
' H ₂ O (@ 0.5893 g/cc)	Output Material	205		
4R 1.96991-2	4R 3.93982-2			
' H ₂ O (@ 0.5404 g/cc)	Output Material	209		
4R 1.80645-2	4R 3.61290-2			
' H ₂ O (@ 0.4916 g/cc)	Output Material	213		
4R 1.64332-2	4R 3.28664-2			
' H ₂ O (@ 0.4567 g/cc)	Output Material	217		
4R 1.52666-2	4R 3.05331-2			
' H ₂ O (@ 0.4287 g/cc)	Output Material	221		
4R 1.43306-2	4R 2.86612-2			
' H ₂ O (@ 0.4008 g/cc)	Output Material	225		
4R 1.33979-2	4R 2.67959-2			

TABLE A.73. (contd)

' H2O (@ 0.3799 g/cc)			Output Material	229
4R 1.26993-2	4R 2.53986-2			
' H2O (@ 0.3589 g/cc)			Output Material	233
4R 1.19973-2	4R 2.39946-2			
' H2O (@ 0.3449 g/cc)			Output Material	237
4R 1.15293-2	4R 2.30586-2			
' H2O (@ 0.3310 g/cc)			Output Material	241
4R 1.10647-2	4R 2.21293-2			
' H2O (@ 0.3240 g/cc)			Output Material	245
4R 1.08307-2	4R 2.16613-2			
' H2O (@ 0.3100 g/cc)			Output Material	249
4R 1.03627-2	4R 2.07254-2			
' H2O (@ 0.3031 g/cc)			Output Material	253
4R 1.01320-2	4R 2.02641-2			
' H2O (@ 0.2961 g/cc)			Output Material	257
4R 9.89803-3	4R 1.97961-2			
' H2O (@ 0.2891 g/cc)			Output Material	261
4R 9.66403-3	4R 1.93281-2			
' H2O (@ 0.2821 g/cc)			Output Material	265
4R 9.43004-3	4R 1.88601-2			
' H2O (@ 0.2751 g/cc)			Output Material	269
4R 9.19604-3	4R 1.83921-2			
' H2O (@ 0.6300 g/cc)			Output Material	273
4R 2.10596-2	4R 4.21193-2			
' Stainless Steel (SS-304)			Output Material	277
4R 3.40068-3	4R 5.76161-2	4R 8.13419-3	4R 1.74506-2	
4R 1.30390-3				
' Control Rod Alloy (B4C)			Output Material	281
4R 6.67715-2	4R 2.05318-2	4R 1.62776-2		
' Inconel (INC-718)			Output Material	285
4R 9.31236-4	4R 8.40994-4	4R 2.73670-3	4R 1.57563-3	
4R 1.59034-2	4R 4.43200-2	4R 1.81108-2	4R 9.18453-4	
' Inconel (INC-750)			Output Material	289
4R 2.59305-3	4R 8.43038-4	4R 5.08027-4	4R 6.22738-3	
4R 6.03794-2	4R 1.48105-2	4R 9.04345-4	4R 1.28896-3	
' Region 1			Output Material	293
4R 0.9290	4R 0.7100			
' Region 2			Output Material	297
4R 0.8254	4R 0.1608	4R 0.0138		
' Region 3			Output Material	301
4R 0.7804	4R 0.2058	4R 0.0138		
' Region 4			Output Material	305
4R 0.3094	4R 0.6768	4R 0.0138		
' Region 5			Output Material	309
4R 0.6394	4R 0.3468	4R 0.0138		
' Region 6			Output Material	313
4R 0.3259	4R 0.4468	4R 0.0138	4R 0.2000	
4R 0.0135				

TABLE A.73. (contd)

' Region 7			Output Material	317
4R 0.5194	4R 0.0968	4R 0.0138	4R 0.3700	
' Region 8			Output Material	321
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 9			Output Material	325
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 10			Output Material	329
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 11			Output Material	333
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 12			Output Material	337
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 13			Output Material	341
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 14			Output Material	345
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 15			Output Material	349
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 16			Output Material	353
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 17			Output Material	357
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 18			Output Material	361
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 19			Output Material	365
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 20			Output Material	369
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 21			Output Material	373
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 22			Output Material	377
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 23			Output Material	381
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 24			Output Material	385
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 25			Output Material	389
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 26			Output Material	393
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 27			Output Material	397
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 28			Output Material	401
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 29			Output Material	405
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 30			Output Material	409
4R 0.6170	4R 0.1200	4R 0.2630		

TABLE A.73. (contd)

' Region 31			Output Material	413
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 32			Output Material	417
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 33			Output Material	421
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 34			Output Material	425
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 35			Output Material	429
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 36			Output Material	433
4R 0.5527	4R 0.1773	4R 0.2630	4R 0.0070	
' Region 37			Output Material	437
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 38			Output Material	441
4R 0.6170	4R 0.1200	4R 0.2630		
' Region 39			Output Material	445
4R 0.6170	4R 0.1200	4R 0.5910		
' Region 40			Output Material	449
4R 0.5610	4R 0.3700	4R 0.0690		
' Region 41			Output Material	453
4R 0.7809	4R 0.1600	4R 0.0591		
' Region 42			Output Material	457
4R 0.4810	4R 0.3590	4R 0.1600		
' Region 43			Output Material	461
4R 0.8830	4R 0.0690	4R 0.0480		
' Region 44			Output Material	465
4R 0.9860	4R 0.0140			
' Region 45			Output Material	469
4R 1.0000				
' Region 46			Output Material	473
4R 0.0670	4R 0.9330			
' Region 47			Output Material	477
4R 0.9600	4R 0.0400			
' Activity Cross Sections from NITAWL/XSDRN				
' 481- B10	485- W182	489- Co59	493- N14	497- Nb93 501- Ca40
' 505- Cl	509- Ni	513- Fe	517- Zr	521- Mo
44R 1.0000				
' Nine Activity Cross Section Sets (Input)				
' 525- flux	526- Cl35	527- Ni58	528- Ni62	529- Ni60 530- Fe58
' 531- Fe59	532- Zr92	533- Mo92		
9R 1.0000				
T				
14**				

TABLE A.73. (contd)

' FLUX ACTIVITY 1080R 1.0	1485
' CL-35 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 4.021+00	1486
' NI-58 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 4.432-01	1487
' NI-62 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 1.358+00	1488
' NI-60 N-P ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 4.688-04	1489
' FE-58 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 1.264-01	1490
' FE-59 N-GAMMA ACTIVITY (NO INFORMATION) 1080R 0.0	1491
' ZR-92 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 6.102-02	1492
' MO-92 N-GAMMA ACTIVITY ORIGEN2 ONE GROUP ACTIV. 1080R 1.706-02	1493

T

TABLE A.74. ANISN Input for the General Electric Reactor Model

```

General Electric BWR full axial activation run
15$$ 1 0 3 4 1 0 0 47 1187 1 27 13 14 40 533 0 533 533 0 0
      0 0 0 25 2 1 21 1 80 0 0 0 0 1 1 0
16** 0.0 0.0 0.00001 1.420892 190.50 244.0 0.0 1.0 0.0 0.5
      0.001 0.05 0.003 0.75
T
3** F1.0
T
1** 0.02279 0.19055 0.22656 0.21597 0.20186 0.14227 F0.0
4** 64I 0.00 328I 63.50 10I 391.10 5I 401.30 20I 406.40
      2I 426.10 2I 427.30 17I 429.20 17I 445.77 13I 462.33
      4I 475.23 16I 479.36 19I 495.46 14I 512.03 4I 526.41
      15I 530.54 17I 545.16 16I 561.72 4I 577.59 13I 581.72
      17I 594.85 17I 611.42 4I 628.77 12I 632.90 17I 644.55
      19I 661.11 4I 679.95 10I 684.08 17I 694.24 21I 710.81
      4I 731.13 9I 735.26 17I 743.94 17I 760.50 5I 777.07
      4I 782.31 7I 786.44 17I 793.64 24I 810.20 1I 834.30
      2I 835.00 2I 837.10 11I 839.30 10I 850.60 42I 860.90
      4I 902.90 226I 908.00 1134.10
5** F1.0
6** 0.0 .1666667 .3333333 1N2
7** -.936742 -.8688903 -.3500212 1M2
8$$ 65R 1 329R 2 11R 3 6R 4 21R 5 3R 6 3R 7
      18R 8 18R 9 14R 10 5R 11 17R 12 20R 13 15R 14
      5R 15 16R 16 18R 17 17R 18 5R 19 14R 20 18R 21
      18R 22 5R 23 13R 24 18R 25 20R 26 5R 27 11R 28
      18R 29 22R 30 5R 31 10R 32 18R 33 18R 34 6R 35
      5R 36 8R 37 18R 38 25R 39 2R 40 3R 41 3R 42
      12R 43 11R 44 43R 45 5R 46 227R 47
9$$ 293 297 301 305 309 313 317 321 325 329 333 337 341 345 349
      353 357 361 365 369 373 377 381 385 389 393 397 401 405 409
      413 417 421 425 429 433 437 441 445 449 453 457 461 465 469
      473 477
10$$ 531I 1 533
11$$ F 0
12** F 1.0
19$$ F3
' FLUX B-10 W-182 Co-59 N-14
22$$ -525 -481 -485 -489 -493
' Nb-93 Ca-40 Cl (nat) Cl-35 Ni (nat,n,gam) Ni (nat,n,p)
      -497 -501 -505 -526 -509 -509
' Ni-58 Ni-62 Ni-60 Fe (nat) Fe-58
      -527 -528 -529 -513 -530
' Fe-59 Zr (nat) Zr-92 Mo (nat) Mo-92
      -531 -517 -532 -521 -533
' 1= (n,gamma) 2= (n,p) 3= (n,alpha)
23$$ 1 3 1 1 2 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1
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