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**OAK RIDGE
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**Detailed Flux Calculations
for the Conceptual Design of the
Advanced Neutron Source Reactor**

May 1995

C. A. Wemple

Advanced Neutron Source

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**DETAILED FLUX CALCULATIONS FOR THE CONCEPTUAL DESIGN OF THE
ADVANCED NEUTRON SOURCE REACTOR**

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ACRONYMS

ANS	Advanced Neutron Source
ANSI	American National Standards Institute
BOC	beginning-of-cycle
CCR	central control rod
CPBT	core pressure boundary tube
CPU	central processing unit
CS	cold source
ENDF	Evaluated Nuclear Data File
ENDL	Evaluated Nuclear Data Library
HB	thermal beam tubes
HT	hydraulic tube
INEL	Idaho National Engineering Laboratory
LANL	Los Alamos National Laboratory
LFE	lower fuel element
LLNL	Lawrence Livermore National Laboratory
LSBT	large slant beam tube
ORNL	Oak Ridge National Laboratory
PF	pneumatic facility
PT	pneumatic tube
SCG	slant cold guide
SH	slant hole
SSR	safety shutdown rods
UFE	upper fuel element
VCG	very cold guide
VH	vertical hole

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ABSTRACT

A detailed MCNP model of the Advanced Neutron Source Reactor has been developed. All reactor components inside the reflector tank were included, and all components were highly segmented. Neutron and photon multigroup flux spectra have been calculated for each segment in the model, and thermal-to-fast neutron flux ratios were determined for each component segment. Axial profiles of the spectra are provided for all components of the reactor. Individual segment statistical uncertainties were limited wherever possible, and the group fluxes for all important reflector components have a standard deviation below 10%.

1. INTRODUCTION

The Advanced Neutron Source (ANS) is a world-class facility for experimental neutron research, presently being designed at the Oak Ridge National Laboratory (ORNL). In the conceptual design, the neutron source is a multipurpose research reactor with a 330 MW(f) highly enriched uranium core, cooled, moderated, and reflected with heavy water. When completed, ANS will be the preeminent ultrahigh neutron flux reactor in the world, with facilities for research programs in biology, materials science, chemistry, fundamental and nuclear physics, and analytical chemistry. Irradiation facilities are planned for a variety of isotope production capabilities, as well as materials irradiation testing.

At the time of this report, the conceptual design phase of the ANS reactor has been completed, and an advanced conceptual design phase is under way. This report is part of an effort to document the analysis methods and results for the conceptual design fully. The methods used to perform neutron and photon multigroup flux spectrum calculations on the ANS reactor design, provides a description of the model used, the resulting multigroup spectra in the components of the reactor, and the thermal-to-fast neutron flux ratios are detailed. In Sect. 2, some necessary background on the reactor design is provided. Section 3 provides the details of the calculational methods employed in the multigroup flux determinations. Section 4 describes the reactor model and includes a brief discussion of recent modifications to the model. Section 5 gives the results in graphical and tabular form, and summary and conclusions are found in Sect. 6.

2. BACKGROUND

2.1 ADVANCED NEUTRON SOURCE DESCRIPTION

The neutron source for ANS is designed as a 330 MW(f), heavy water-cooled, -moderated, and -reflected reactor with a highly enriched (93%) uranium silicide/aluminum core. The core is composed of two radially and axially offset annular fuel elements, with the central hole filled with the primary coolant. Each element is composed of involute plates clad in Al-6061. The upper fuel element (UFE) contains 432 plates, and the lower fuel element (LFE) contains 252 plates. The fuel meat in each plate is continuously graded both axially and radially. Boron carbide is added to the top and bottom zones of the fuel plates in an unfueled region to provide extra negative reactivity. Primary operational reactivity control is achieved by three central hafnium control rods, which also provide the primary shutdown reactivity. These rods are located in the central hole of the annular fuel elements. Independent, diverse shutdown reactivity is provided by eight hafnium rods located symmetrically around the core in the reflector. A core pressure boundary tube (CPBT) separates the pressurized primary coolant from the unpressurized reflector region. To reduce neutron absorption in the structural elements, all support and structural members are composed of the aluminum alloy Al-6061.

The reflector is enclosed in an Al-6061 vessel 4.3-m high and 3.5 m in diam. The reflector contains a variety of experimental facilities for isotope production, material irradiation, neutron spectrum modification, and neutron beam extraction. Seven thermal beam tubes for thermal neutron extraction are located in the reflector near the location of peak thermal flux. Several irradiation facilities [e.g., hydraulic and pneumatic tubes (HTs and PTs), slant holes (SHs)] are available in the reflector, as well as five instrumented and five uninstrumented in-core locations, for exposing materials to a variety of different radiation fields. Isotope production facilities [vertical holes (VHs)] are also provided in the reflector for production of industrial and medical isotopes, and up to 30 in-core locations are available for production of transuranic isotopes. Two cryogenically cooled cold sources are provided for cold neutron research, and one heated graphite hot source is available for hot neutron experiments. The reflector vessel is surrounded by a large pool of light water that acts as a biological shield.

A more detailed description of the ANS design is available in the *ANS Conceptual Design Report Summary*.¹

2.2 DEVELOPMENT OF ANS MCNP MODEL

The MCNP code² is a three-dimensional, continuous-energy, time-dependent, generalized-geometry, coupled neutron-photon-electron Monte Carlo transport code. It is capable of performing both eigenvalue (KCODE) and fixed-source calculations and may tally particle and energy currents, fluxes, reaction rates, and energy deposition. Most of the continuous-energy cross-section data included with the code were developed from Evaluated Nuclear Data File (ENDF) B-V data³ by the NJOY code⁴ with the remainder developed from the Lawrence Livermore National Laboratory (LLNL) Evaluated Nuclear Data Library (ENDL)-5 libraries.⁵ The geometry is modeled using a variety of one-, two-, and special four-degree surface definitions, which are combined using intersection, union, and complement operators to define cells. All cells are treated in a Cartesian coordinate system.

2.2.1 Geometry

The ANS conceptual design was modeled in the MCNP code, with all components defined as specified by the advanced conceptual design (with few exceptions), as shown in Figs. 1–3.^{1,6} Only a few geometric approximations were introduced in the model.

The only limitations to the geometric fidelity of the model were those of the MCNP code itself. Each fuel element was modeled by nine homogeneous fuel regions, where the fuel density in each region was averaged over the appropriate volume and corresponded closely to regions of approximately constant fuel density. This procedure was followed for two reasons. First, the involute shape used for the actual plates is unavailable in the MCNP geometry description. Even though very good approximations of this shape are available,⁷ the number of fuel plates involved in modeling the core would make the model cumbersome. Second, and more importantly, there is no way to model the continuous fuel grading in MCNP because a distribution for material density is not available in the code. Practical limits on the number of materials allowed in a problem, which translate to computer memory limits, dictated that a coarse approximation to the fuel distribution be used. Since this coarser fuel grading was collapsed from a much finer grading model at ORNL, the error introduced is minimal.

Further approximations were made in the reflector component modeling. There were several elements (SHs and HTs) which contained sections that were designed as curved cylindrical tubes. These surfaces—designated cylindrical tori in the MCNP code geometry—are generally available for use but are limited in that they must be parallel to one of the Cartesian coordinate axes. As these components were not parallel to the axes, these curved sections were modeled as abutting straight cylindrical tubes. Since the curved sections were well above the irradiation zone of the component and, generally, well away from the core, only minimal error was introduced.

Some slight approximations were made in modeling the reflector tank. The tank head and bottom both contained curved sections near their intersection with the reflector tank wall. Incorporating these curved sections exactly was not possible, so they were modeled as straight intersections. Also, the flanges on the reflector tank for supporting and connecting the reflector penetrations (beam tubes, etc.) were not included because their remoteness from the core precludes any statistically significant effect. The fluxes in the flanges will be nearly identical to those in the appropriate section of the reflector tank.

2.2.2 Materials and Cross Sections

The reactor materials used in the model were also exactly as specified at the beginning-of-cycle (BOC). All known or specified impurities and alloying elements were included in the material definitions, except where certain elements were not available in the MCNP cross-section libraries. The L7 fuel grading was used for the core fuel distribution,⁸ and the nine-region model used is described in Sect. 2.2.1.

Other than the fuel grading approximation, the only other limitation imposed on the materials used was because of the lack of zinc in the MCNP cross-section libraries. For this model, zinc was approximated as copper. As zinc is only a trace impurity in the Al-6061 alloy (0.1% by weight), this approximation is expected to have a negligible effect on the model results.

Certain cross-section approximations were necessary in the model, mainly because of limitations in the MCNP libraries. All cross-sections used in the BOC model were at 300 K, including the fuel isotopes and the heavy water scattering kernels. These cross-sections were used because the uranium isotopes were available at temperatures of 300 and 3000 K only, and the latter is well outside

Fig. 1. Elevation view of the Advanced Neutron Source reactor.

Fig. 2. Cross-section at reactor midplane (ref. dwg. X3E017003A008).

[illegible]

the normal operating range of the ANS core. Thus, some small error in the cross-sections will be present in the resonance energy range because of the difference in resonance broadening.

The scattering kernels were also only available at temperatures of 300 and 400 K. The 300 K data were used since they are closer to the normal ANS operating temperature than the 400 K data.

Additionally, some cross-section sets—most notably the high actinides—did not include photon production data. Thus, the photons produced in these transplutonium target isotopes were not included in the photon flux results. However, this is a relatively small (much less than statistical) contribution and is not overly significant.

2.2.3 Other Considerations

Because MCNP is a stochastic code, it produces results with an inherent statistical uncertainty. Thus, the level of convergence of the calculation becomes very important. A sufficient number of histories must be run to allow two effects to be accommodated. First, a sufficient number of particles must be tallied to produce good statistics. For the coupled neutron-photon case, 150 KCODE cycles (batches) with 25,000 starting particles per cycle were run, 50 million particles were used for the fission product photon-only fixed source calculation, and 10 million particles were used for each of the three ^{28}Al β -decay photon-only fixed source calculations. This tally yielded a satisfactory statistical correlation in a fairly reasonable amount of time.

The second effect that must be considered is the stability of the fission source. For eigenvalue problems, an initial fission source distribution is input by the user, which the code uses to start particles for the first cycle. After each cycle, the source is updated by overwriting the old source with the actual spatial fission distribution computed by MCNP. Because of the statistical nature of the code, this fission source will fluctuate over the first few cycles until the source distribution approaches the actual fission distribution in the reactor. Previous work has shown that this process takes about five cycles for the ANS model.⁹ Thus, for tallying purposes, the first five KCODE cycles were discarded.

MCNP requires the volume of each cell for its internal tally normalization and is capable of calculating the volume of any cell that is symmetric about any axis that can be translated from the coordinate axes. However, because of natural intersections between surfaces, some cell volumes can not be computed by MCNP directly. For these cases, a ray-tracing calculation was used to compute these missing volumes. This calculation is accomplished by voiding all cells and placing a biased surface source around the model. The inwardly directed particles will undergo no interactions within the cells, and a flux tally in the desired cells will yield the cell volume directly. If a sufficient number of particles is run, the volume can be calculated to a high degree of accuracy. However, there is still a degree of uncertainty attached, and a small statistical error is hidden in some of the reflector component segments as a result of this uncertainty. The error introduced was <0.5% for the volume calculation, which was much less than the statistical error on the tally results. However, it is prudent to be aware of this additional error component.

3. NEUTRON AND PHOTON FLUX CALCULATION METHOD

3.1 INTRODUCTION

There are four significant components to the neutron and photon fluxes in the ANS reactor: (1) prompt neutrons and photons from fission and fission-neutron induced reactions, denoted as the prompt component; (2) the photons created from fission product decay, denoted as the fission product component; (3) the photons generated from the β -decay of ^{28}Al , denoted as the ^{28}Al decay component; (4) and the neutrons generated by photoneutron interactions in deuterium, denoted as the (γ, n) component. The first two components have their sources primarily in the fuel, while the third is distributed through all aluminum components in the reactor, and the fourth is only in the heavy water.

The neutron fluxes were tallied in four energy groups, and the photon fluxes were tallied in five energy groups. The upper limit of the neutron energy range was at 17 MeV, while the photon energy ranged from 1 keV–100 MeV. The group structures for the neutron and photon energy groups are given in Table 1.

Table 1. Neutron and photon energy group structure

Group no.	Neutron upper energy (eV)	Photon upper energy (MeV)
1	17×10^6	100
2	1×10^5	6
3	100	2.225
4	0.625	1
5		0.05

A few assumptions were made for these calculations. First, it is assumed that the photons produced by interactions of decay electrons with the reactor materials is negligible. This assumption is true in terms of the total photon flux and also for the high-energy photon groups. However, this assumption may not be valid for the groups <1 MeV, where the associated Bremsstrahlung photons are produced. If photon production becomes a significant effect, this assumption will be investigated.

Another assumption involves the (γ, n) interactions in deuterium. It has been assumed that the ^{28}Al β -decay photons will not result in any photoneutron generation because their energy is below the threshold for deuterium (γ, n) reactions. The lack of photoneutrons eliminates the probability of the $(m\gamma, n)$ interactions where more than one photon "strikes" the nucleus in sufficiently short time to cause a neutron release. While this assumption was extended to the other photon components as well, it is expected to have no noticeable effect. This expectation results from the very small probability of the $(m\gamma, n)$ reaction compared to the (γ, n) reaction.

A third assumption is that the only significant source of photons from decay of capture products is from the β -decay of ^{28}Al . This assumption is good for a clean core at BOC and beginning

of life, which is the condition examined for this report. However, for significant burnup levels, this component may need to be examined further.

The fourth assumption ignores the ^{28}Al β -decay and fission product photon sources from the transplutonium production targets. This is a good assumption, considering the small volumes involved and the low fission amounts in these targets. This assumption was made because of the large number of source points (>4000) involved and the relatively small contribution.

A final main assumption involves the fission product decay sources in the fuel. There are no fission products present at true BOC, yet this component of the photon flux must be accounted for to give an accurate characterization of the photon flux distribution. Thus, some approximation must be made for the time within the burn cycle at which to generate the fission product decay source. For this analysis, as in previous cases, the decay source was taken at 1 d into the cycle. This presents a time very near BOC, yet has nearly saturated fission product concentrations. It also represents a point in the ANS cycle where the decay beta and photon spectra have become fairly stable in time. These determinations were made from analysis of ORIGEN2 results.

The remainder of this section explains the calculational path for the flux determinations in detail.

3.2 BASE CALCULATION

The base calculation is used to calculate the prompt neutron and photon components of the flux spectra. This calculation also determines the spatial distribution of the fixed sources for the fission product photon and ^{28}Al β -decay photon components and a portion of the (γ, n) fixed source distribution.

The base calculation is a coupled neutron-photon eigenvalue calculation. Tallies are taken in each reactor component for the neutron and photon fluxes (F4:N and F4:P), the capture rate in all aluminum elements (F4:N tally), and the fission rate in the fuel (F4:N tally).

Since all MCNP tallies are normalized per fission neutron, some normalization for these tallies is necessary. Each of the flux calculation components has a slightly different normalization factor, but each is based upon the total fission neutron source in the reactor. This normalization factor is computed by the following formulation, which directly yields the normalization for the prompt neutron and photon component:

$$P_n = \frac{P \cdot \bar{\nu}}{Q \cdot k_{\text{eff}} \cdot CQ} \quad , \quad (1)$$

where

P = reactor power (W),

$\bar{\nu}$ = average number of neutrons/fission,

Q = 202.47 MeV/fission,

k_{eff} = core eigenvalue,

CQ = 1.602×10^{13} J/MeV.

The recoverable energy released per fission, Q , is taken from the ENDF/B-V cross-section files for U-235 (MF = 1, MT = 458). The division by the core eigenvalue is necessary to adjust the total fission source by the amount necessary to have a critical reactor. Equation (1) is used as the basis for all subsequent normalization factors for the other flux calculation components.

3.3 FISSION PRODUCT DECAY

Since the information on the buildup and decay of fission products is not available in the MCNP calculation results, the fission product decay components of the flux spectra required special treatment. Thus, an outside code had to be used to provide these data. That code was the DKPOWR code,¹⁰ from Los Alamos National Laboratory (LANL). DKPOWR accepts fission rates in various fissile and fertile isotopes and computes fission product decay spectra, rates, and powers for desired times during the burnup and decay history. Other quantities, such as the average fission product decay photon energy per fission, can be derived from these output quantities. The DKPOWR code uses decay data from ENDF/B-V supplemented heavily with provisions of the ANSI/ANS-5.1-1979 American National Standard for Decay Heat Power in Light Water Reactors.

An inherent assumption in performing these calculations is that these data for light water reactors are applicable to the ANS reactor, which is a heavy water system. Since the DKPOWR code calculates the decay powers from fission "pulse" functions and then integrates these functions over the input fission history, it is assumed that there is little effect on the fission product yields from the reactor core spectrum. This assumption is fairly true for thermal reactors in general, as there is only about a 10% difference in the major fission product yields between fission energies of 0.0253 eV and 500 keV.¹¹ This minor difference suggests that DKPOWR is applicable to the ANS reactor without significant error.

The fission rate tally results are weighted with the cell volume and normalized to unit integral to yield the spatial source for the fission product photon transport calculation. This spatial source, coupled with the fission product photon spectrum computed by DKPOWR, gives a complete definition of the fixed source for MCNP. This source is used in a fixed source mode photon-only calculation to perform the fission product photon transport and calculate the fission product photon flux component for each reactor structural element. This calculation uses the F4:P tally in MCNP. This tally, normalized to one source photon, is

$$P_{nFP} = \frac{P_n \cdot \gamma_{FP}}{\bar{\nu}} \quad , \quad (2)$$

where

P_n = total fission neutron source from Eq. 1,
 γ_{FP} = average number of fission product photons/fission,
 $\bar{\nu}$ = average number of neutrons/fission,

which is the total fission product photon source.

3.4 ALUMINUM-28 BETA DECAY

The ²⁸Al β -decay photon component is treated in a similar fashion to the fission product photon component. The aluminum capture rate tally is weighted with the cell volumes and then normalized to unit integral. This calculation produces the spatial source for the MCNP fixed source photon-only transport calculation. The energy spectrum is simply a delta function at an energy of 1.7787 MeV.^{3,12} As in the fission product photon case, the photon flux is calculated using the F4:P tally. This tally, normalized to one source photon, is

$$P_{n\beta\gamma} = P_n \cdot \sum_{cells} (F4 \cdot V) \quad , \quad (3)$$

where

P_n = total fission neutron source from Eq. 1,
 $F4$ = aluminum capture rate tally results from base case,
 V = cell volume,

which is the total ^{28}Al β -decay photon source.

3.5 PHOTONEUTRONS FROM HEAVY WATER

The source of high-energy neutrons from the (γ,n) interaction with heavy water is the primary source of fast neutrons in the reflector. Inclusion of this component is crucial to correctly calculating the thermal-to-fast flux ratios. However, MCNP is not presently capable of handling this interaction directly, so an indirect method akin to those used for the ^{28}Al β -decay photons is used.

In the base calculation and the fission product photon case, a 12-group photon flux tally was taken in each cell containing heavy water. The ^{28}Al β -decay photons were not included in this tally because they have an energy below the heavy water (γ,n) threshold. This tally was folded with a representation of the heavy water (γ,n) reaction cross section distilled from several references¹³⁻¹⁷ to produce a (γ,n) reaction rate in each heavy water (D_2O) cell. The cross section is depicted in Fig. 4. This 12-group reaction rate was normalized to unit total reaction rate in each cell to give an energy-dependent source of neutrons from all D_2O cells. The neutron energy spectrum was approximated by:

$$E_n = \frac{1}{2} (E_\gamma - 2.225 \text{ MeV}) \quad , \quad (4)$$

where E_γ is 2.225 MeV. This approximation is quite accurate and is recommended for use in low-energy physics applications.¹⁷ This source was used in a neutron-only fixed-source calculation to yield the (γ,n) neutron flux contribution.

Fig. 4. Heavy water (γ, n) cross-section used for photoneutron source calculation.

4. ADVANCED NEUTRON SOURCE MCNP MODEL

The MCNP model used for the flux calculations is described in this chapter. The MCNP coordinate system employed and the reference points for defining radial and axial positions are based on a three-dimensional Cartesian system with the origin at the core axial midplane and core radial centerline. All components were subdivided into small segments, except where noted. A three-dimensional representation of the ANS reactor is shown in Fig. 5, with a close-up view of the core region in Fig. 6.

Some modifications and corrections to the MCNP model have been made since the final heat load report.¹⁸ A protective sheath has been added around each safety shutdown rod (SSR). These sheaths are described in Sect. 4.2.1. Other minor corrections have been made in the geometry, but none of the corrections has a significant effect on the model. However, these corrections were included for completeness and correctness. Also, the trace impurity elements have been added to the hafnium in both the central control rods (CCRs) and the SSRs.

4.1 CORE AND CENTRAL HOLE

4.1.1 Core

The ANS reactor core was modeled by two radially and axially offset annular fuel elements, each with a fueled region 507-mm high. UFE has inner and outer radii of 175 and 235 mm, respectively, while LFE has inner and outer radii of 102 and 168 mm, respectively. The bottom of UFE is 25-mm above the core midplane, and the top of LFE is 25-mm below the core midplane. The fuel elements are each subdivided into nine homogenous material regions, with the continuous axial and radial fuel density grading represented by varied fuel density in these nine regions. These nine region fuel densities were computed from the much finer representation used for fuel grading studies at ORNL. The core is divided into 160 spatial regions, with 80 regions in each fuel element. The spatial arrangement of the core is shown in Fig. 7. The total core loading is ~ 18 kg of ^{235}U .

Both fuel elements are bordered inside and outside by Al-6061 sideplates, which serve as anchor points and support structure for the circular involute fuel plates. These sideplates are 7-mm thick and extend the length of the fuel elements. The UFE inner sideplate and LFE outer sideplate couple together at the core midplane.

The boron ends in the core are modeled as homogeneous regions of boron carbide, aluminum alloy Al-6061, and heavy water. The ends have the same inner and outer radii as the fuel elements and are 15-mm thick. The total boron loading in the core is ~ 13.4 g of ^{10}B .

4.1.2 Core Support Structures

Also shown in Fig. 7 is the remaining structure inside the CPBT. This structure comprises the core support tube and the extensions of the UFE inner sideplate and LFE outer sideplate. The core support tube is an annulus of inner radius 95 mm and outer radius 102 mm. This tube attaches to the LFE inner sideplate and extends the entire height of the reflector tank. The other support structure is an annulus with inner and outer radii of 168 and 175 mm, respectively, extending the entire height of the reflector tank. Both structures are made of the aluminum alloy Al-6061. The gaps between the structures are filled with pressurized heavy water.

Fig. 5. Three-dimensional view of the Advanced Neutron Source MCNP conceptual design model.

Fig. 6. Close-up view of the core region in Fig. 5.

Fig. 7. Axial view of the geometry inside the core pressure boundary tube. [Origin of the figure is at (0,0,0) relative to the origin of the model.]

4.1.3 Core Pressure Boundary Tube

The CPBT is a double-walled pressure vessel separating the pressurized primary coolant from the unpressurized reflector. The inner wall is an annulus with inner and outer radii of 235 and 240 mm, respectively, which extends above and below the upper fuel element outer sideplate to the reflector tank. The outer wall is an annulus with inner and outer radii 245 and 253 mm, respectively. Both walls are composed of Al-6061. The gap between the walls is filled with pressurized heavy water. CPBT is shown in Fig. 7.

4.1.4 Control Rods

CCRs are three hafnium annuli 1.2-m long with inner and outer radii of 31.5 and 35.56 mm, respectively. These annuli are supported by the rod support tubes, which are Al-6061 annuli extending the height of the reflector tank with inner and outer radii of 22.1 and 28.5 mm, respectively, inside the hafnium annuli; and radii 22.1 and 35.56 mm, respectively, above and below the hafnium. The gaps between the absorbers and support tubes are filled with pressurized heavy water, as are the interiors of the support tubes. In this BOC configuration, the CCRs are positioned 145-mm above the core midplane. The rods are located inside the core support tube at a radius of 52.07-mm from the core centerline. The CCRs are surrounded with pressurized heavy water (Fig. 7).

4.1.5 In-Core Targets

4.1.5.1 Upper Irradiation Targets

The upper irradiation targets, or in-core material irradiation targets, are a set of ten targets composed of 87% aluminum and 13% SS-316. These targets are located inside UFE and outside the core support tube. The targets are located at a radius of 130.4-mm from the core centerline, with their bottoms 25-mm above the core centerline, and are 507-mm long. There are two target sizes in this set. Five of the targets are instrumented targets 48-mm in diam. and the remaining targets are uninstrumented targets 16-mm diameter and the remaining target types are supported by a 14-mm thick semicircular Al-6061 bracket attached to the core support tube. The target locations are located symmetrically about the core centerline. A sample target is shown in Fig. 8, with two shown in their actual locations in Fig. 7.

4.1.5.2 Transplutonium Production Targets

The transplutonium production targets are a set of up to 30 locations outside the LFE and inside the inner CPBT wall at a radius of 195.326-mm from the core centerline. The tops of these targets are 50-mm below the core midplane. The targets are composed of actinide oxide/aluminum powder pellets of 2.4756-mm radius clad with a thin layer of Al-1100. The targets are ~520-mm long.

Each target sits inside an Al-6061 tube with a 3.3274-mm inner radius and a 4.7625-mm outer radius. These 30 target locations are located symmetrically about LFE. These targets are designed for the production of californium and einsteinium for industrial and experimental uses. A sample target is shown in Fig. 9.

Fig. 8. Axial view of an instrumented upper irradiation target (typical). (Origin of the figure is at the center of the target.)

Fig. 9. Axial view of a transplutonium production rod (typical). (Origin of the figure is at the center of the rod.)

4.1.6 Stainless Steel Bolts

To determine the heat load in the stainless steel bolts attaching CPBT, two small rings of SS-304 were added to the model. The first ring was placed at the top of CPBT at the joint with the reflector tank top. The other was placed 1.521-m below the core midplane.

4.2 REFLECTOR COMPONENTS

The reflector components of the ANS model are described in this section. Figure 10 shows a view of the reflector at the core midplane level. All vertically oriented facilities extend upward to the reflector tank top, and all horizontally oriented facilities extend outward to the reflector tank walls. All locations were provided by the ANS design team at ORNL,¹⁹ and the facility shapes and dimensions were obtained from ref. 5.

4.2.1 Safety Rods

The SSRs are eight rods arranged symmetrically outside CPBT at a radius of 340 mm. The bottom of the absorber is parked 800-mm above the core midplane. Each rod is composed of a 750-mm-long hafnium annulus with inner and outer radii of 38.48 and 42.545 mm, respectively, supported by an Al-6061 support tube. The support tube has inner and outer radii of 34.55 and 38.48 mm, respectively, inside the hafnium, and 34.55 and 42.545 mm, respectively, above the hafnium. Each SSR has a 64.77-mm thick Al-6061 leader on which the hafnium annulus rests. Surrounding each SSR is a protective sheath extending from 735.23-mm above the core midplane to the top of the reflector vessel. The sheath is fixed in place, allowing the rod to move inside it. The inner and outer radii are 44.45 and 51.562 mm, respectively. The SSRs are driven from above the reflector tank. A typical SSR is shown in Fig. 11.

4.2.2 Beam Tubes

4.2.2.1 Thermal Beam Tubes

There are three different beam tube types in the present ANS design. The thermal beam tubes (HBs, Fig. 12) are centered at the core midplane, with the entrance to the tube at a radius of 430 mm from the core centerline. The arrangement is shown in Fig. 10. Each of the seven thermal beam tubes is an elliptical annulus with an outer major axis of 114 mm, an outer minor axis of 64 mm, and a wall thickness of 14 mm. Each has a hemiellipsoidal endcap 3.7-mm thick and a similarly shaped cooling jacket with a wall thickness of 3 mm. The walls and endcaps are composed of Al-6061, and the tubes are evacuated within. The gap between the cooling jacket and beam tube is filled with heavy water.

4.2.2.2 Through-Tube

The second beam tube type is the through-tube (HB-5/HB-10), which is a cylindrical tube of inner and outer radii 98 and 106 mm, respectively. This tube is surrounded by a truncated conical cooling jacket. The wall thickness of the cooling jacket is 3 mm, and both the jacket and the tube are composed of Al-6061. The gap between the tube and the cooling jacket is filled with heavy water. The through-tube is shown in Fig. 13.

Fig. 10. Radial view of the reactor at the core midplane ($z = 0$).

Fig. 11. Axial view of a safety rod (typical SSR). (Origin of the figure is at the rod center.)

Fig. 12. View along the axis of a thermal beam tube (typical HB). (Origin of the figure is at the tube center.)

Fig. 13. View along the axis of the through tube (HB-5/HB-10). (Origin of the figure is at the tube center.)

4.2.2.3 Large Slant Beam Tube

The third beam tube type is the large slant beam tube (LSBT). The LSBT consists of two concentric cylindrical slanted tubes of Al-6061, with heavy water between the tubes, and air inside the inner tube. The inner tube has an inner radius of 100 mm, and the outer tube has inner radius of 110 mm. Both tubes have a 5-mm wall thickness. The tubes are capped with hemispherical Al-6061 endcaps with similar 5-mm wall thicknesses. The LSBT is located at a radius of 801.75 mm and 365.24-mm above midplane. The LSBT is shown in Fig. 14.

4.2.3 Irradiation Facilities

The reflector irradiation facilities consist of the four HTs, the two SHs, five PTs, and two pneumatic facilities (PFs) outside the reflector tank in the biological shield. A description of each is given below.

4.2.3.1 Hydraulic Tubes

HTs are facilities formed by two concentric cylindrical Al-6061 tubes. The outer tube has inner and outer radii of 17.5 and 21 mm, respectively, and the inner (flight) tube has inner and outer radii of 7.1 and 9.5 mm, respectively. The gap between the tubes is filled with heavy water, as is the remainder of the space in the flight tube outside of the sample. Samples in the HT are composed of 50% aluminum and 50% SS-316 and are 585.8-mm long with an outer radius of 50 mm.

Two of the HTs, HT-1 and HT-3, are vertical tubes at a radius of 1064 mm, with the bottom of the tubes 366.65-mm below the core midplane. The other two HTs, HT-2 and HT-4, are curved above the top of the UFE, with the bottom of HT-2 at a radius of 310-mm and 88.2-mm below the core midplane, and the bottom of HT-4 at a radius of 380-mm and 366.65-mm below the midplane. In both of these tubes, the irradiation zone at the core level is vertical. The curved section is modeled as the abutment of the vertical section with a slanted section. Typical HTs are shown in Figs. 15–17.

4.2.3.2 Slant Holes

The SHs are facilities formed by two concentric cylindrical Al-6061 tubes. The outer tube has inner and outer radii of 36.5 and 40.0 mm, respectively, and the inner tube has radii 26.15 and 27.75 mm, respectively. The gap between the tubes is filled with heavy water, and the space outside the sample in the inner tube is evacuated. Both are located at a radius of 330 mm, with the bottom of the tubes 27.77-mm below the midplane. As for HT-2 and HT-4, the approach from above the core to the irradiation zone is curved. This curved section is modeled as the abutment of the vertical section with a slanted section. A typical SH (upper and lower sections) is shown in Figs. 18 and 19.

4.2.3.3 Pneumatic Tubes

The PTs are four short slanted tubes and one long vertical tube with a rabbit transfer tube and four air tubes inside. The outer tube and transfer tube are concentric, and the air tubes are arranged at the four "compass points" about the transfer tube. The vertical tube (PT-1) is at a radius of 1650 mm, and the bottom is 304.8-mm below midplane. Two of the slanted tubes, PT-3 and PT-4, have their lower ends at a radius of 1012.11 mm and 1206.33-mm above midplane, with the other two slanted tubes, PT-2 and PT-5, at a radius of 1190.81-mm and 1419.25-mm above midplane. Transfer tubes PT-1, PT-2, and PT-3 are shown in Figs. 20–22.

Fig. 14. View along the axis of the large slant beam tube (LSBT). (Origin of the figure is at the tube center.)

Fig. 15. Axial view of hydraulic tube HT-1 (typical of HT-3). (Origin of the figure is at the tube center.)

Fig. 16. Axial view of lower hydraulic tube HT-2 (typical of HT-4). (Origin of the figure is at the center of the lower tube section.)

Fig. 17. View along the axis of upper hydraulic tube HT-2 (typical of HT-4). (Origin of the figure is at the center of the upper tube section.)

Fig. 18. Axial view of the lower slant tube SH-1 (typical of SH-2). (Origin of the figure is at the center of the lower tube section.)

Fig. 19. View along the axis of the upper slant tube SH-1 (typical of SH-2). (Origin of the figure is at the center of the upper tube section.)

Fig. 20. Axial view of the pneumatic tube PT-1. (Origin of the figure is at the tube center.)

Fig. 21. View along the axis of the pneumatic tube PT-2 (typical of PT-5). (Origin of the figure is at the tube center.)

Fig. 22. View along the axis of the pneumatic tube PT-3 (typical of PT-4). (Origin of the figure is at the tube center.)

4.2.3.4 Pneumatic Facilities

The PFs, PF-1 and PF-2, are two adjoining rectangular cross-section shells with evacuated cylindrical transfer tubes centered inside. The shells and tube walls are composed of Al-6061, and the gap between is filled with light water. These are located at radii 1822.7 and 1848.1 mm, respectively, and terminate 21.2-mm above and below midplane, respectively. The rectangular shell has outside dimensions of 25.4 mm by 76.2 mm, with a wall thickness of 1.5 mm. The transfer tube has an outer radius of 4.75 mm and a wall thickness 1.575 mm. The PFs are shown in Fig. 23.

4.2.4 Isotope Production Facilities

The four isotope production facilities, or VHs, are made of three concentric cylindrical tubes composed of Al-6061, each with a facility containing an aluminum/iridium target. The VHs are located at radius 1384 mm and terminate 496.96-mm below midplane. The outer tube has an outer radius of 30.15 mm, and the inner tube has an outer radius of 21.1 mm. Both tubes have a wall thickness of 4.8 mm. The target holder, the innermost tube, is 3.175-mm thick with an inner radius of 9.525 mm. The aluminum/iridium targets have a radius of 8.9535 mm, are 1.07-m long, and contain 7.5 g of natural iridium. A typical isotope production facility is shown in Fig. 24.

4.2.5 Cold Sources

A typical cold source is shown in Figs. 25 and 26. The moderator vessel is a spherical shell filled with liquid deuterium. This shell is surrounded by a helium-filled inner thimble, an outer thimble, and a cooling jacket. The space between thimbles is evacuated, and the gap between cooling jacket and outer thimble is filled with heavy water. The cold source thimble contains the moderator vessel, two tie rods to support it, a liquid deuterium feed line and gaseous deuterium return line for cooling the moderator vessel, and a very cold guide (VCG) tube for extracting cold neutrons from the reentrant cavity in the moderator vessel. All components are composed of Al-6061. The cold sources are located at a radius of 750 mm and 25-mm above the midplane. These locations are also shown in Fig. 10.

4.2.6 Slant Cold Guide Tubes

The slant cold guide tubes (SCG) are two concentric cylindrical slanted Al-6061 tubes extending from each cold source to the reflector tank top. The inner and outer radii of the inner tubes are 77.1 and 84.2 mm, respectively, and 88.9 and 95.25 mm, respectively, for the outer tubes. The gap between the tubes is evacuated, as is the inner tube. The centerline of each tube points at the center of the moderator vessel of the respective cold source. A typical slant cold guide (SCG-1) is shown in Fig. 27.

4.2.7 Hot Source

The ANS hot source is shown in Figs. 28 and 29. The moderator is a sphere of graphite surrounded by a graphite wool insulating material. This insulating material is surrounded by three Zircaloy-4 shells with light water between the first two, helium between the second two, a helium-filled inner thimble, and an outer thimble. The space between thimbles is filled with heavy water. All components, other than the two Zircaloy-4 shells, are composed of Al-6061. The hot source is located at a radius of 1000 mm and at the core midplane. This location is also shown in Fig. 10.

Fig. 23. Axial view of the pneumatic facilities (PFs). (Origin of the figure is at the center of PF-1)

Fig. 24. Axial view of a vertical isotope production facility (typical VH). (Origin of the figure is at the tube center.)

Fig. 25. Top view of the cold source CS-1 moderator vessel (typical of CS-2). (Origin of the figure is at the center of the cold moderatory vessel.)

Fig. 26. View along the thimble axis of cold source CS-1 (typical of CS-2). (Origin of the figure is at the cold source assembly center.)

Fig. 27. View along the axis of the lower slant cold guide tube SCG-1 (typical of SCG-2).
(Origin of the figure is at the tube center.)

Fig. 28. Top view of the hot source moderator (HS). (Origin of the figure is at the center of the hot moderator.)

Fig. 29. View along the thimble axis of the hot source (HS). (Origin of the figure is at the hot source assembly center.)

4.3 REFLECTOR VESSEL AND LIGHT WATER POOL

The reflector vessel is divided into three major sections: the vessel head, vessel wall, and vessel bottom. These are shown in Figs. 30–32, respectively. All are composed of Al-6061, with the vessel wall 25.4-mm thick, the top 88.9-mm thick, and the bottom 101.6-mm thick. The wall is annular, and the top and bottom are truncated cones, sealed at the apex.

The light water pool is several meters in diameter and is not fully necessary to the model. Thus, only the first 200 mm of light water are included in this model.

Fig. 30. Axial view of the reflector vessel head. (Origin of the figure is at the center of the vessel head.)

Fig. 31. Axial view of the reflector vessel wall. (Origin is at the center of the vessel wall.)

Fig. 32. Axial view of the reflector vessel bottom. (Origin of the figure is at the center of the vessel bottom.)

5. RESULTS

The results of the flux spectrum calculations are shown in the appendices. The neutron fluxes and thermal-to-fast group neutron flux ratios are shown graphically in Appendix A and Appendix B, respectively, and in tabular form in Appendix D. The photon fluxes are shown graphically in Appendix C and in tabular form in Appendix E. Table 2 shows the table and figure numbers for the components used in the model. All results shown, except the thermal-to-fast neutron flux ratios, are given in units of $\text{m}^{-2} \text{s}^{-1}$. Any nonfuel components with materials not specifically noted are composed of Al-6061.

All statistical errors in the tables are relative errors in percent, and the error bars in the graphs show absolute errors of one standard deviation (1σ). In all graphs and tables, the data were eliminated if the resulting standard deviation was greater than 30% because the results at this level are unreliable. These deletions are noted in the tables with a footnote. Any minor discrepancies in the total fluxes in the tables are caused by round-off error.

Some figures in the appendices have flux results plotted on log scales with divisions at noninteger powers of 10. The minor divisions between the major divisions are then in multiples at the previous major division. For example, if two major divisions are at 2×10^{17} and 2×10^{18} , then the minor divisions between would be at 4×10^{17} , 6×10^{17} , 8×10^{17} , etc. Other occurrences of this type of division can be interpreted in a similar fashion.

A brief, general discussion of the results follows. It should be noted that the diagonal lines in the histogram figures represent regions where data were deleted because of poor statistical correlation.

5.1 NEUTRON FLUXES AND FLUX RATIOS

As expected, the thermal flux component dominates the reflector regions, and the fast flux components dominate in the core regions. The general trend is that the farther from the core centerline and midplane the location of the flux tally, the more the thermal flux dominates the spectrum. This trend is the result of the severe attenuation of the fast flux components with penetration into the reflector, caused almost entirely by neutron thermalization. This effect can be seen very clearly from the thermal-to-fast flux ratios, which increase greatly in the reflector—in many cases becoming unquantifiable because of the lack of reliable results in the fast groups.

Table 2. Reference table for figure and table numbers for Advanced Neutron Source model components

Component name	Geometry	Neutron flux			Photon flux	
	figure	Tables	Figures	Ratio figures	Tables	Figures
Fuel elements	3	D.1–D.16	A.1–A.16	B.1–B.16	E.1–E.16	C.1–C.16
Core support tube	3	D.17	A.17	B.17	E.17	C.17
Core pressure boundary tubes	3	D.20–D.21	A.20–A.21	B.20–B.21	E.20–E.21	C.20–C.21
Fuel element sideplates	3	D.18–D.19	A.18–A.19	B.18–B.19	E.18–E.19	C.18–C.19
Fuel element endplates	3	D.198			E.198	
Upper irradiation targets	4	D.28–D.31	A.28–A.31	B.28–B.31	E.28–E.31	C.28–C.31
Central control rods	3	D.22–D.27	A.22–A.27	B.22–B.27	E.22–E.27	C.22–C.27
Transplutonium production rods	5	D.32–D.34	A.32–A.34	B.32–B.34	E.32–E.34	C.32–C.34
Primary system D ₂ O	D.1–D.2	D.178– D.181			E.178–E.181	
Reflector vessel	26–28	D.175–D.177	A.173	B.131	E.175–E.178	C.173
Reflector D ₂ O	D.3–D.10	D.182–D.197			E.182–E.197	
Safety shutdown rods	7	D.35–D.58	A.35–A.58	B.35–B.58	E.35–E.58	C.35–C.58
Beam tubes	6, 8–10	D.59–D.76	A.59–A.76	B.59–B.76	E.59–E.76	C.59–C.76
Hydraulic tubes	11–13	D.77–D.92	A.77–A.92	B.77–B.88	E.77–E.92	C.77–C.92
Slant tubes	14–15	D.93–D.102	A.93–A.102	B.89–B.98	E.93–E.102	C.93–C.102
Cold sources	21–22	D.153–D.165	A.153–A.165	B.115–B.122	E.153–E.165	C.153–C.165
Vertical isotope production facilities	20	D.137–D.152	A.137– A.152	B.102–B.114	E.137–E.152	C.137–C.152
Pneumatic tubes	16–18	D.103–D.132	A.103–A.132	B.99–B.101	E.103–E.132	C.103–C.132
Slant cold guide tubes	23	D.166–D.169	A.166–A.169	B.123–B.126	E.166–E.169	C.166–C.169
Pneumatic facilities	19	D.133–D.136	A.133–A.136		E.133–E.136	C.133–C.136
Hot source	24–25	D.170–D.174	A.170–A.174	B.127–B.130	E.170–E.174	C.170–C.174
Stainless steel bolts	- - -	D.199			E.199	

It is interesting to examine the group flux profiles in the core regions because they display the most interplay between the various effects influencing the neutron flux spectrum. In the fuel elements themselves, the thermal flux is relatively flat in both axial and radial profiles and is nearly an order of magnitude smaller than the flux in the fast groups. There is a slight increase in the thermal flux magnitude near the reflector as thermalized neutrons reenter the core. This effect is most easily seen in the upper fuel element, which is closer to the reflector. It is interesting to note that the thermal flux does not increase greatly near the central hole in the lower fuel element because of neutron absorption in the hafnium control rods.

The fast flux groups, groups 1 and 2, are influenced most by the fuel density grading, which determines the spatial fission neutron source distribution in the core. Examination of the group 1 and group 2 fluxes in the fuel elements, in Fig. A.1–A.16, shows that the axial profiles closely follow the ^{235}U density variations in the L7 fuel grading scheme.²⁰ The flux is higher at the coolant inlet zones than at the coolant exit, and there is a definite peak radially near the center of the fuel element. Very similar profiles are exhibited in the in-core irradiation targets, which are very close to the fuel elements. These profiles can be seen in Figs. A.28–A.34.

The group flux profiles in the core support structures, shown in Figs. A.17–A.21, illustrate the effects of both the presence of the fuel elements and the central control rods. In Fig. A.17, the core support tube clearly shows the dip in the thermal flux and the peaks in the fast group fluxes, imposed by the LFE at about -500 mm. To a lesser extent, the same effect is seen from UFE at about +25 mm. For UFE, there is a noticeable drop in the fast group fluxes caused by the presence of the irradiation targets between the fuel element, the core support tube, and the control rods at +145 mm. The latter produces a large dip in the thermal flux, which remains quite low until the moderating region above UFE is reached at about +500 mm. Similar effects are seen in the remaining structures, with the closest fuel element influencing the flux shape most.

The effects of the control rods can be seen most clearly by examining the control rod structures in Figs. A.22–A.27. The hafnium absorber influences the spectrum in the control rod support/drive tube greatly. This influence can be seen from the large drop in the thermal flux and smaller dips in the other group fluxes at about +145 mm, which is the leading tip of hafnium. There is also an order of magnitude increase in the thermal flux near the top of the hafnium at +1345 mm. To a lesser extent, the support tube also shows the influences of LFE.

5.2 PHOTON FLUXES

The photon group fluxes all display similar energy dependence. In all cases, the group 4 flux dominates the photon spectrum, with groups 3 and 2 nearly an order of magnitude lower, and groups 1 and 5 much lower still. The peak photon fluxes regions are near the fuel elements, especially closest to the CCRs. As the CCRs are a very significant source of photons, and the main source of photons in the highest energy group (group 1), the photon fluxes near the CCRs are significantly larger than other areas. However, hafnium is also an excellent photon attenuator, so there is a noticeable dip in the photon flux for the control rod supports inside the hafnium absorber.

The photon flux behavior in the reflector components is as expected. There are no significant high-energy photon sources in the reflector, and the only appreciable photon source is from the β -decay of ^{28}Al in the Al-6061 structures. This source falls only in group 3. Thus, the higher energy photon groups suffer from significant attenuation and spreading with increasing penetration into the reflector. Even the lower energy groups have photon fluxes several orders of magnitude below those in the core regions.

6. SUMMARY AND CONCLUSIONS

Multigroup neutron and photon flux spectra have been calculated in all components of the ANS conceptual design MCNP mode. Good results have been achieved generally, with some statistical limitations resulting from small component volumes and/or extreme distance from the particle source(s). To enhance the confidence in the results of these calculations, it is important to note that they are totally consistent with the heat load results given in ref. 13.

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Appendix A
NEUTRON FLUX RESULT FIGURES

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Appendix B

THERMAL-TO-FAST GROUP NEUTRON FLUX RATIO FIGURES

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Figure B-95. Thermal-to-fast group neutron flux ratio in the slant tube SH-2 lower outer tube.

Figure B-96. Thermal-to-fast group neutron flux ratio in the slant tube SH-2 50% Al/50% SS-316 sample.

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Figure B-110. Thermal-to-fast group neutron flux ratio in the vertical hole VH-3 sample holder.

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Appendix C

PHOTON FLUX RESULT FIGURES

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Figure C-63. Five-group photon flux profiles in the beam tube HB-3 flight tube.

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Figure C-91. Five-group photon flux profiles in the hydraulic tube HT-4 upper flight tube.

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Figure C-93. Five-group photon flux profiles in the slant tube SH-1 lower inner tube.

Figure C-94. Five-group photon flux profiles in the slant tube SH-1 lower outer tube.

Figure C-95. Five-group photon flux profiles in the slant tube SH-1 50% Al/50% SS-316 sample.

Figure C-96. Five-group photon flux profiles in the slant tube SH-1 upper inner tube.

Figure C-97. Five-group photon flux profiles in the slant tube SH-1 upper outer tube.

Figure C-98. Five-group photon flux profiles in the slant tube SH-2 lower inner tube.

Figure C-99. Five-group photon flux profiles in the slant tube SH-2 lower outer tube.

Figure C-100. Five-group photon flux profiles in the slant tube SH-2 50% Al/50% SS-316 sample.

Figure C-101. Five-group photon flux profiles in the slant tube SH-2 upper inner tube.

Figure C-102. Five-group photon flux profiles in the slant tube SH-2 upper outer tube.

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Figure C-104. Five-group photon flux profiles in the pneumatic tube PT-1 transfer tube.

Figure C-105. Five-group photon flux profiles in the pneumatic tube PT-1 air tube 1.

Figure C-106. Five-group photon flux profiles in the pneumatic tube PT-1 air tube 2.

Figure C-107. Five-group photon flux profiles in the pneumatic tube PT-1 air tube 3.

Figure C-108. Five-group photon flux profiles in the pneumatic tube PT-1 air tube 4.

Figure C-109. Five-group photon flux profiles in the pneumatic tube PT-2 outer tube.

Figure C-110. Five-group photon flux profiles in the pneumatic tube PT-2 transfer tube.

Figure C-111. Five-group photon flux profiles in the pneumatic tube PT-2 air tube 1.

Figure C-112. Five-group photon flux profiles in the pneumatic tube PT-2 air tube 2.

Figure C-113. Five-group photon flux profiles in the pneumatic tube PT-2 air tube 3.

Figure C-114. Five-group photon flux profiles in the pneumatic tube PT-2 air tube 4.

Figure C-115. Five-group photon flux profiles in the pneumatic tube PT-3 outer tube.

Figure C-116. Five-group photon flux profiles in the pneumatic tube PT-3 transfer tube.

Figure C-117. Five-group photon flux profiles in the pneumatic tube PT-3 air tube 1.

Figure C-118. Five-group photon flux profiles in the pneumatic tube PT-3 air tube 2.

Figure C-119. Five-group photon flux profiles in the pneumatic tube PT-3 air tube 3.

Figure C-120. Five-group photon flux profiles in the pneumatic tube PT-3 air tube 4.

Figure C-121. Five-group photon flux profiles in the pneumatic tube PT-4 outer tube.

Figure C-122. Five-group photon flux profiles in the pneumatic tube PT-4 transfer tube.

Figure C-123. Five-group photon flux profiles in the pneumatic tube PT-4 air tube 1.

Figure C-124. Five-group photon flux profiles in the pneumatic tube PT-4 air tube 2.

Figure C-125. Five-group photon flux profiles in the pneumatic tube PT-4 air tube 3.

Figure C-126. Five-group photon flux profiles in the pneumatic tube PT-4 air tube 4.

Figure C-127. Five-group photon flux profiles in the pneumatic tube PT-5 outer tube.

Figure C-128. Five-group photon flux profiles in the pneumatic tube PT-5 transfer tube.

Figure C-129. Five-group photon flux profiles in the pneumatic tube PT-5 air tube 1.

Figure C-130. Five-group photon flux profiles in the pneumatic tube PT-5 air tube 2.

Figure C-131. Five-group photon flux profiles in the pneumatic tube PT-5 air tube 3.

Figure C-132. Five-group photon flux profiles in the pneumatic tube PT-5 air tube 4.

Figure C-133. Five-group photon flux profiles in the pneumatic facility PF-1 outer shell.

Figure C-134. Five-group photon flux profiles in the pneumatic facility PF-1 transfer tube.

Figure C-135. Five-group photon flux profiles in the pneumatic facility PF-2 outer shell.

Figure C-136. Five-group photon flux profiles in the pneumatic facility PF-2 transfer tube.

Figure C-137. Five-group photon flux profiles in the vertical hole VH-1 outer tube.

Figure C-138. Five-group photon flux profiles in the vertical hole VH-1 inner tube.

Figure C-139. Five-group photon flux profiles in the vertical hole VH-1 sample holder.

Figure C-140. Five-group photon flux profiles in the vertical hole VH-1 Aluminum/Iridium sample.

Figure C-141. Five-group photon flux profiles in the vertical hole VH-2 outer tube.

Figure C-142. Five-group photon flux profiles in the vertical hole VH-2 inner tube.

Figure C-143. Five-group photon flux profiles in the vertical hole VH-2 sample holder.

Figure C-144. Five-group photon flux profiles in the vertical hole VH-2 Aluminum/Iridium sample.

Figure C-145. Five-group photon flux profiles in the vertical hole VH-3 outer tube.

Figure C-146. Five-group photon flux profiles in the vertical hole VH-3 inner tube.

Figure C-147. Five-group photon flux profiles in the vertical hole VH-3 sample holder.

Figure C-148. Five-group photon flux profiles in the vertical hole VH-3 Aluminum/Iridium sample.

Figure C-149. Five-group photon flux profiles in the vertical hole VH-4 outer tube.

Figure C-150. Five-group photon flux profiles in the vertical hole VH-4 inner tube.

Figure C-151. Five-group photon flux profiles in the vertical hole VH-4 sample holder.

Figure C-152. Five-group photon flux profiles in the vertical hole VH-4 Aluminum/Iridium sample.

Figure C-153. Five-group photon flux profiles in the cold source CS-1 inner thimble.

Figure C-154. Five-group photon flux profiles in the cold source CS-1 outer thimble.

Figure C-155. Five-group photon flux profiles in the cold source CS-1 cooling jacket.

Figure C-156. Five-group photon flux profiles in the cold source CS-1 very cold guide tube.

Figure C-157. Five-group photon flux profiles in the cold source CS-1 liquid D2 feed line.

Figure C-158. Five-group photon flux profiles in the cold source CS-1 D2 return line.

Figure C-159. Five-group photon flux profiles in the cold source CS-2 inner thimble.

Figure C-160. Five-group photon flux profiles in the cold source CS-2 outer thimble.

Figure C-161. Five-group photon flux profiles in the cold source CS-2 cooling jacket.

Figure C-162. Five-group photon flux profiles in the cold source CS-2 very cold guide tube.

Figure C-163. Five-group photon flux profiles in the cold source CS-2 liquid D2 feed line.

Figure C-164. Five-group photon flux profiles in the cold source CS-2 D2 return line.

Figure C-165. Five-group photon flux profiles in the slant cold guide tube SCG-1 outer tube.

Figure C-166. Five-group photon flux profiles in the slant cold guide tube SCG-1 inner tube.

Figure C-167. Five-group photon flux profiles in the slant cold guide tube SCG-2 outer tube.

Figure C-168. Five-group photon flux profiles in the slant cold guide tube SCG-2 inner tube.

Figure C-169. Five-group photon flux profiles in the hot source HS-1 graphite shell towards the core.

Figure C-170. Five-group photon flux profiles in the hot source HS-1 graphite shell half away from core.

Figure C-171. Five-group photon flux profiles in the hot source HS-1 outer thimble.

Figure C-172. Five-group photon flux profiles in the hot source HS-1 inner thimble.

Figure C-173. Five-group photon flux profiles in the reflector vessel wall.

Appendix D
NEUTRON FLUX RESULT TABLES

Table D-1. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=175-179 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.6523E+19	± 0.69%	1.8141E+19	± 0.63%	6.6020E+18	± 0.95%	3.6852E+18	± 1.10%	4.4951E+19	± 0.43%	2.2304E-01
470.25	2.1032E+19	± 0.51%	2.3248E+19	± 0.48%	7.4897E+18	± 0.74%	3.0302E+18	± 1.00%	5.4800E+19	± 0.33%	1.4407E-01
410.75	2.4905E+19	± 0.44%	2.8894E+19	± 0.41%	8.8152E+18	± 0.64%	3.0729E+18	± 0.94%	6.5687E+19	± 0.29%	1.2339E-01
353.50	2.8709E+19	± 0.46%	3.3094E+19	± 0.41%	1.0070E+19	± 0.67%	3.1343E+18	± 1.02%	7.5008E+19	± 0.29%	1.0917E-01
303.50	3.1042E+19	± 0.44%	3.6673E+19	± 0.39%	1.0852E+19	± 0.64%	3.3527E+18	± 0.98%	8.1920E+19	± 0.28%	1.0800E-01
253.50	3.3170E+19	± 0.42%	3.8884E+19	± 0.38%	1.1809E+19	± 0.62%	3.6365E+18	± 0.93%	8.7501E+19	± 0.27%	1.0963E-01
203.50	3.5003E+19	± 0.42%	4.0671E+19	± 0.37%	1.2339E+19	± 0.60%	4.0584E+18	± 0.88%	9.2071E+19	± 0.26%	1.1594E-01
146.25	3.6831E+19	± 0.37%	4.1265E+19	± 0.34%	1.2913E+19	± 0.53%	4.8253E+18	± 0.72%	9.5835E+19	± 0.23%	1.3101E-01
86.75	3.7216E+19	± 0.39%	4.0255E+19	± 0.36%	1.3720E+19	± 0.55%	5.7413E+18	± 0.71%	9.6932E+19	± 0.25%	1.5427E-01
42.25	3.3071E+19	± 0.48%	3.8305E+19	± 0.44%	1.4663E+19	± 0.64%	6.7233E+18	± 0.80%	9.2762E+19	± 0.29%	2.0330E-01

Table D-2. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=179-184 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.7493E+19	± 0.63%	1.8264E+19	± 0.61%	6.3750E+18	± 0.92%	3.0079E+18	± 1.14%	4.5140E+19	± 0.41%	1.7194E-01
470.25	2.2351E+19	± 0.48%	2.3244E+19	± 0.46%	7.2397E+18	± 0.73%	2.5465E+18	± 1.02%	5.5381E+19	± 0.32%	1.1393E-01
410.75	2.6586E+19	± 0.41%	2.8859E+19	± 0.39%	8.4625E+18	± 0.62%	2.6363E+18	± 0.95%	6.6544E+19	± 0.27%	9.9161E-02
353.50	3.0228E+19	± 0.42%	3.3111E+19	± 0.40%	9.6053E+18	± 0.65%	2.6675E+18	± 1.03%	7.5612E+19	± 0.28%	8.8244E-02
303.50	3.2725E+19	± 0.41%	3.6526E+19	± 0.38%	1.0478E+19	± 0.63%	2.8253E+18	± 0.99%	8.2553E+19	± 0.26%	8.6334E-02
253.50	3.4920E+19	± 0.39%	3.8842E+19	± 0.37%	1.1302E+19	± 0.60%	3.0883E+18	± 0.95%	8.8152E+19	± 0.26%	8.8440E-02
203.50	3.6667E+19	± 0.38%	4.0720E+19	± 0.36%	1.1853E+19	± 0.58%	3.4356E+18	± 0.92%	9.2676E+19	± 0.25%	9.3696E-02
146.25	3.8571E+19	± 0.34%	4.1247E+19	± 0.32%	1.2412E+19	± 0.52%	3.9671E+18	± 0.75%	9.6197E+19	± 0.23%	1.0285E-01
86.75	3.9375E+19	± 0.36%	4.0079E+19	± 0.35%	1.3061E+19	± 0.54%	4.6284E+18	± 0.74%	9.7144E+19	± 0.24%	1.1755E-01
42.25	3.4649E+19	± 0.44%	3.8146E+19	± 0.42%	1.3830E+19	± 0.63%	5.4123E+18	± 0.85%	9.2037E+19	± 0.28%	1.5620E-01

Table D-3. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=184-190 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.8062E+19	± 0.59%	1.8105E+19	± 0.59%	6.1929E+18	± 0.91%	2.5780E+18	± 1.17%	4.4938E+19	± 0.39%	1.4274E-01
470.25	2.3317E+19	± 0.45%	2.3105E+19	± 0.45%	7.0368E+18	± 0.71%	2.3066E+18	± 1.04%	5.5765E+19	± 0.31%	9.8921E-02
410.75	2.7732E+19	± 0.38%	2.8807E+19	± 0.38%	8.2264E+18	± 0.61%	2.3882E+18	± 0.96%	6.7154E+19	± 0.26%	8.6117E-02
353.50	3.1631E+19	± 0.39%	3.3175E+19	± 0.38%	9.3295E+18	± 0.63%	2.3844E+18	± 1.06%	7.6519E+19	± 0.27%	7.5382E-02
303.50	3.4205E+19	± 0.38%	3.6288E+19	± 0.36%	1.0075E+19	± 0.61%	2.5229E+18	± 1.00%	8.3092E+19	± 0.25%	7.3756E-02
253.50	3.6401E+19	± 0.37%	3.8856E+19	± 0.35%	1.0784E+19	± 0.58%	2.7416E+18	± 0.97%	8.8782E+19	± 0.25%	7.5318E-02
203.50	3.8258E+19	± 0.36%	4.0456E+19	± 0.35%	1.1427E+19	± 0.57%	2.9794E+18	± 0.92%	9.3121E+19	± 0.24%	7.7877E-02
146.25	4.0114E+19	± 0.32%	4.1088E+19	± 0.31%	1.1951E+19	± 0.51%	3.3982E+18	± 0.78%	9.6552E+19	± 0.22%	8.4712E-02
86.75	4.0657E+19	± 0.33%	3.9941E+19	± 0.34%	1.2508E+19	± 0.53%	3.9227E+18	± 0.78%	9.7028E+19	± 0.23%	9.6483E-02
42.25	3.5841E+19	± 0.42%	3.7684E+19	± 0.41%	1.3298E+19	± 0.62%	4.6114E+18	± 0.88%	9.1435E+19	± 0.27%	1.2866E-01

Table D-4. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=190-205 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.8985E+19	± 0.47%	1.7975E+19	± 0.50%	5.9816E+18	± 0.77%	2.5399E+18	± 0.97%	4.5482E+19	± 0.33%	1.3379E-01
470.25	2.4785E+19	± 0.36%	2.2987E+19	± 0.38%	6.7689E+18	± 0.61%	2.3126E+18	± 0.86%	5.6853E+19	± 0.26%	9.3308E-02
410.75	2.9490E+19	± 0.31%	2.8537E+19	± 0.33%	7.9472E+18	± 0.54%	2.4567E+18	± 0.78%	6.8430E+19	± 0.23%	8.5306E-02
353.50	3.3563E+19	± 0.32%	3.3060E+19	± 0.33%	9.0058E+18	± 0.55%	2.3616E+18	± 0.88%	7.7990E+19	± 0.23%	7.0363E-02
303.50	3.6240E+19	± 0.31%	3.6099E+19	± 0.31%	9.6410E+18	± 0.52%	2.5344E+18	± 0.85%	8.4514E+19	± 0.22%	6.9935E-02
253.50	3.8450E+19	± 0.30%	3.8511E+19	± 0.30%	1.0352E+19	± 0.51%	2.6643E+18	± 0.82%	8.9978E+19	± 0.21%	6.9293E-02
203.50	4.0348E+19	± 0.29%	3.9974E+19	± 0.30%	1.0865E+19	± 0.50%	2.8434E+18	± 0.79%	9.4031E+19	± 0.20%	7.0471E-02
146.25	4.2105E+19	± 0.26%	4.0582E+19	± 0.27%	1.1338E+19	± 0.45%	3.1193E+18	± 0.69%	9.7144E+19	± 0.19%	7.4083E-02
86.75	4.2185E+19	± 0.27%	3.9194E+19	± 0.29%	1.1785E+19	± 0.47%	3.4839E+18	± 0.70%	9.6648E+19	± 0.20%	8.2585E-02
42.25	3.6979E+19	± 0.34%	3.6802E+19	± 0.35%	1.2598E+19	± 0.53%	4.3040E+18	± 0.75%	9.0683E+19	± 0.23%	1.1639E-01

Table D-5. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=205-220 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.9947E+19	± 0.44%	1.7530E+19	± 0.49%	5.8594E+18	± 0.75%	3.4484E+18	± 0.81%	4.6784E+19	± 0.31%	1.7288E-01
470.25	2.6083E+19	± 0.34%	2.2340E+19	± 0.38%	6.6445E+18	± 0.60%	3.3635E+18	± 0.68%	5.8430E+19	± 0.25%	1.2895E-01
410.75	3.0914E+19	± 0.29%	2.7953E+19	± 0.32%	7.9518E+18	± 0.53%	3.5805E+18	± 0.61%	7.0400E+19	± 0.21%	1.1582E-01
353.50	3.5210E+19	± 0.30%	3.2113E+19	± 0.32%	8.9162E+18	± 0.53%	3.3764E+18	± 0.69%	7.9615E+19	± 0.22%	9.5894E-02
303.50	3.7894E+19	± 0.29%	3.5250E+19	± 0.31%	9.5739E+18	± 0.51%	3.5278E+18	± 0.68%	8.6245E+19	± 0.21%	9.3097E-02
253.50	4.0144E+19	± 0.28%	3.7424E+19	± 0.30%	1.0213E+19	± 0.50%	3.6914E+18	± 0.66%	9.1472E+19	± 0.20%	9.1954E-02
203.50	4.2003E+19	± 0.27%	3.8885E+19	± 0.29%	1.0702E+19	± 0.48%	3.8417E+18	± 0.64%	9.5432E+19	± 0.20%	9.1463E-02
146.25	4.3660E+19	± 0.24%	3.9250E+19	± 0.27%	1.1054E+19	± 0.44%	3.9858E+18	± 0.57%	9.7950E+19	± 0.18%	9.1291E-02
86.75	4.3740E+19	± 0.26%	3.7670E+19	± 0.29%	1.1367E+19	± 0.46%	4.3528E+18	± 0.59%	9.7130E+19	± 0.19%	9.9514E-02
42.25	3.8218E+19	± 0.32%	3.4948E+19	± 0.34%	1.2099E+19	± 0.52%	5.3035E+18	± 0.65%	9.0569E+19	± 0.22%	1.3877E-01

Table D-6. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=220-226 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.9608E+19	± 0.52%	1.6897E+19	± 0.56%	5.9251E+18	± 0.85%	5.2113E+18	± 0.78%	4.7642E+19	± 0.35%	2.6577E-01
470.25	2.5741E+19	± 0.39%	2.1863E+19	± 0.42%	6.8252E+18	± 0.68%	5.3023E+18	± 0.64%	5.9732E+19	± 0.27%	2.0599E-01
410.75	3.0404E+19	± 0.34%	2.7151E+19	± 0.36%	8.1294E+18	± 0.59%	5.6233E+18	± 0.57%	7.1308E+19	± 0.23%	1.8495E-01
353.50	3.5083E+19	± 0.34%	3.1228E+19	± 0.36%	9.0450E+18	± 0.60%	5.2301E+18	± 0.64%	8.0586E+19	± 0.24%	1.4908E-01
303.50	3.7852E+19	± 0.33%	3.4337E+19	± 0.34%	9.8120E+18	± 0.57%	5.5106E+18	± 0.62%	8.7511E+19	± 0.23%	1.4558E-01
253.50	4.0082E+19	± 0.32%	3.6368E+19	± 0.33%	1.0417E+19	± 0.56%	5.6832E+18	± 0.62%	9.2551E+19	± 0.22%	1.4179E-01
203.50	4.1977E+19	± 0.31%	3.7660E+19	± 0.33%	1.0879E+19	± 0.54%	5.8779E+18	± 0.60%	9.6394E+19	± 0.21%	1.4003E-01
146.25	4.3739E+19	± 0.28%	3.7954E+19	± 0.30%	1.1085E+19	± 0.49%	5.9513E+18	± 0.53%	9.8729E+19	± 0.19%	1.3606E-01
86.75	4.3744E+19	± 0.30%	3.6527E+19	± 0.32%	1.1470E+19	± 0.52%	6.4412E+18	± 0.55%	9.8183E+19	± 0.21%	1.4725E-01
42.25	3.8277E+19	± 0.37%	3.3573E+19	± 0.39%	1.1996E+19	± 0.60%	7.6064E+18	± 0.62%	9.1452E+19	± 0.25%	1.9872E-01

Table D-7. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=226-231 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.8991E+19	± 0.53%	1.6561E+19	± 0.57%	5.9248E+18	± 0.86%	6.7758E+18	± 0.70%	4.8253E+19	± 0.34%	3.5678E-01
470.25	2.4892E+19	± 0.40%	2.1382E+19	± 0.43%	6.8722E+18	± 0.68%	6.8117E+18	± 0.58%	5.9957E+19	± 0.27%	2.7365E-01
410.75	2.9495E+19	± 0.35%	2.6732E+19	± 0.36%	8.2710E+18	± 0.59%	7.2614E+18	± 0.52%	7.1759E+19	± 0.23%	2.4620E-01
353.50	3.4405E+19	± 0.35%	3.0749E+19	± 0.37%	9.2027E+18	± 0.60%	6.9883E+18	± 0.57%	8.1345E+19	± 0.24%	2.0312E-01
303.50	3.7037E+19	± 0.34%	3.3635E+19	± 0.35%	9.9807E+18	± 0.58%	7.2987E+18	± 0.55%	8.7951E+19	± 0.23%	1.9707E-01
253.50	3.9100E+19	± 0.33%	3.5582E+19	± 0.34%	1.0621E+19	± 0.56%	7.5564E+18	± 0.54%	9.2859E+19	± 0.22%	1.9326E-01
203.50	4.1165E+19	± 0.32%	3.6733E+19	± 0.33%	1.1068E+19	± 0.55%	7.8310E+18	± 0.53%	9.6796E+19	± 0.22%	1.9023E-01
146.25	4.2990E+19	± 0.29%	3.7154E+19	± 0.30%	1.1331E+19	± 0.49%	7.9320E+18	± 0.47%	9.9407E+19	± 0.20%	1.8451E-01
86.75	4.3012E+19	± 0.30%	3.5531E+19	± 0.33%	1.1578E+19	± 0.52%	8.6082E+18	± 0.48%	9.8729E+19	± 0.21%	2.0014E-01
42.25	3.7862E+19	± 0.38%	3.2563E+19	± 0.40%	1.2048E+19	± 0.60%	1.0039E+19	± 0.55%	9.2512E+19	± 0.25%	2.6514E-01

Table D-8. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=231-235 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
514.75	1.7948E+19	± 0.56%	1.6303E+19	± 0.58%	6.0806E+18	± 0.88%	8.7296E+18	± 0.64%	4.9061E+19	± 0.35%	4.8638E-01
470.25	2.3430E+19	± 0.42%	2.0834E+19	± 0.44%	7.0688E+18	± 0.69%	8.6752E+18	± 0.53%	6.0007E+19	± 0.27%	3.7027E-01
410.75	2.7762E+19	± 0.36%	2.6011E+19	± 0.37%	8.4149E+18	± 0.59%	9.3568E+18	± 0.48%	7.1545E+19	± 0.24%	3.3703E-01
353.50	3.2592E+19	± 0.37%	3.0195E+19	± 0.38%	9.4341E+18	± 0.61%	9.3302E+18	± 0.51%	8.1551E+19	± 0.24%	2.8628E-01
303.50	3.5232E+19	± 0.35%	3.2948E+19	± 0.36%	1.0212E+19	± 0.58%	9.7610E+18	± 0.50%	8.8153E+19	± 0.23%	2.7705E-01
253.50	3.7109E+19	± 0.34%	3.4863E+19	± 0.35%	1.0890E+19	± 0.57%	1.0179E+19	± 0.49%	9.3042E+19	± 0.22%	2.7431E-01
203.50	3.8820E+19	± 0.33%	3.6082E+19	± 0.34%	1.1448E+19	± 0.55%	1.0455E+19	± 0.48%	9.6805E+19	± 0.22%	2.6933E-01
146.25	4.0651E+19	± 0.30%	3.6480E+19	± 0.31%	1.1614E+19	± 0.50%	1.0760E+19	± 0.42%	9.9504E+19	± 0.20%	2.6468E-01
86.75	4.0796E+19	± 0.32%	3.4593E+19	± 0.34%	1.1915E+19	± 0.53%	1.1719E+19	± 0.43%	9.9023E+19	± 0.21%	2.8725E-01
42.25	3.5792E+19	± 0.39%	3.1696E+19	± 0.41%	1.2206E+19	± 0.61%	1.3761E+19	± 0.49%	9.3455E+19	± 0.25%	3.8449E-01

Table D-9. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=102-106 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)		Group 2 (100.0 - $\text{E}+05$ eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	2.8754E+19	± 0.67%	4.3776E+19	± 0.54%	1.9278E+19	± 0.76%	9.3344E+18	± 0.94%	1.0114E+20	± 0.37%	3.2462E-01
-86.75	3.6050E+19	± 0.51%	4.8012E+19	± 0.44%	1.9659E+19	± 0.64%	9.6289E+18	± 0.80%	1.1335E+20	± 0.30%	2.6710E-01
-146.25	4.1478E+19	± 0.45%	5.3560E+19	± 0.39%	1.9729E+19	± 0.59%	9.0887E+18	± 0.77%	1.2386E+20	± 0.27%	2.1912E-01
-203.50	4.8084E+19	± 0.46%	5.7503E+19	± 0.41%	1.8566E+19	± 0.65%	6.9606E+18	± 0.91%	1.3111E+20	± 0.29%	1.4476E-01
-253.50	4.8956E+19	± 0.45%	5.8879E+19	± 0.40%	1.7975E+19	± 0.66%	6.2705E+18	± 0.95%	1.3208E+20	± 0.29%	1.2808E-01
-303.50	4.7890E+19	± 0.46%	5.8644E+19	± 0.41%	1.7270E+19	± 0.67%	5.7602E+18	± 0.98%	1.2956E+20	± 0.29%	1.2028E-01
-353.50	4.6216E+19	± 0.47%	5.5873E+19	± 0.41%	1.6123E+19	± 0.69%	5.4869E+18	± 1.01%	1.2370E+20	± 0.29%	1.1872E-01
-410.75	4.3609E+19	± 0.44%	5.0515E+19	± 0.40%	1.4422E+19	± 0.66%	4.9779E+18	± 0.94%	1.1352E+20	± 0.28%	1.1415E-01
-470.25	3.8500E+19	± 0.50%	4.2594E+19	± 0.46%	1.2609E+19	± 0.76%	5.1475E+18	± 0.97%	9.8851E+19	± 0.32%	1.3370E-01
-514.75	3.0890E+19	± 0.65%	3.3730E+19	± 0.61%	1.1321E+19	± 0.96%	6.5668E+18	± 1.02%	8.2508E+19	± 0.41%	2.1258E-01

Table D-10. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=106-111.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)		Group 2 (100.0 - $\text{E}+05$ eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.0348E+19	± 0.61%	4.3755E+19	± 0.51%	1.8577E+19	± 0.71%	8.1180E+18	± 0.95%	1.0080E+20	± 0.35%	2.6749E-01
-86.75	3.7967E+19	± 0.46%	4.7965E+19	± 0.41%	1.9093E+19	± 0.60%	8.7921E+18	± 0.78%	1.1382E+20	± 0.28%	2.3157E-01
-146.25	4.3646E+19	± 0.41%	5.3490E+19	± 0.37%	1.9233E+19	± 0.56%	8.2731E+18	± 0.75%	1.2464E+20	± 0.26%	1.8955E-01
-203.50	5.0578E+19	± 0.41%	5.7040E+19	± 0.39%	1.7721E+19	± 0.62%	5.8882E+18	± 0.92%	1.3123E+20	± 0.27%	1.1642E-01
-253.50	5.1436E+19	± 0.41%	5.8476E+19	± 0.38%	1.7219E+19	± 0.63%	5.2153E+18	± 0.96%	1.3235E+20	± 0.27%	1.0139E-01
-303.50	5.0102E+19	± 0.41%	5.8105E+19	± 0.38%	1.6534E+19	± 0.64%	4.8260E+18	± 1.00%	1.2957E+20	± 0.27%	9.6323E-02
-353.50	4.8218E+19	± 0.42%	5.5271E+19	± 0.39%	1.5509E+19	± 0.65%	4.5622E+18	± 1.02%	1.2356E+20	± 0.28%	9.4616E-02
-410.75	4.5529E+19	± 0.40%	5.0280E+19	± 0.38%	1.3680E+19	± 0.63%	4.0393E+18	± 0.97%	1.1353E+20	± 0.27%	8.8720E-02
-470.25	4.0276E+19	± 0.45%	4.2409E+19	± 0.44%	1.1961E+19	± 0.72%	4.0079E+18	± 1.01%	9.8653E+19	± 0.30%	9.9511E-02
-514.75	3.2021E+19	± 0.59%	3.3625E+19	± 0.57%	1.0676E+19	± 0.90%	5.0565E+18	± 1.09%	8.1380E+19	± 0.38%	1.5791E-01

Table D-11. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=111.5-118.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.1330E+19	± 0.55%	4.3082E+19	± 0.47%	1.8117E+19	± 0.68%	7.1418E+18	± 0.94%	9.9671E+19	± 0.33%	2.2795E-01
-86.75	3.9607E+19	± 0.43%	4.7830E+19	± 0.39%	1.8488E+19	± 0.58%	7.9836E+18	± 0.76%	1.1391E+20	± 0.27%	2.0157E-01
-146.25	4.5313E+19	± 0.37%	5.3162E+19	± 0.35%	1.8559E+19	± 0.54%	7.6283E+18	± 0.73%	1.2466E+20	± 0.24%	1.6835E-01
-203.50	5.2478E+19	± 0.38%	5.6814E+19	± 0.37%	1.7003E+19	± 0.60%	5.1145E+18	± 0.91%	1.3141E+20	± 0.25%	9.7459E-02
-253.50	5.3307E+19	± 0.38%	5.8122E+19	± 0.36%	1.6377E+19	± 0.60%	4.4395E+18	± 0.96%	1.3224E+20	± 0.25%	8.3283E-02
-303.50	5.1711E+19	± 0.38%	5.7494E+19	± 0.36%	1.5794E+19	± 0.61%	4.1550E+18	± 1.01%	1.2915E+20	± 0.26%	8.0350E-02
-353.50	4.9735E+19	± 0.39%	5.4908E+19	± 0.37%	1.4873E+19	± 0.63%	3.8976E+18	± 1.02%	1.2341E+20	± 0.26%	7.8366E-02
-410.75	4.7031E+19	± 0.37%	5.0048E+19	± 0.36%	1.3019E+19	± 0.61%	3.3069E+18	± 0.98%	1.1340E+20	± 0.25%	7.0312E-02
-470.25	4.1363E+19	± 0.41%	4.2007E+19	± 0.41%	1.1366E+19	± 0.70%	3.2670E+18	± 1.07%	9.8004E+19	± 0.29%	7.8983E-02
-514.75	3.2699E+19	± 0.54%	3.3429E+19	± 0.54%	1.0339E+19	± 0.86%	4.0632E+18	± 1.16%	8.0530E+19	± 0.36%	1.2426E-01

Table D-12. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=118.5-135 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.2178E+19	± 0.44%	4.2954E+19	± 0.40%	1.7393E+19	± 0.57%	6.3915E+18	± 0.81%	9.8917E+19	± 0.27%	1.9863E-01
-86.75	4.1199E+19	± 0.34%	4.6807E+19	± 0.33%	1.7841E+19	± 0.49%	7.6802E+18	± 0.64%	1.1353E+20	± 0.23%	1.8642E-01
-146.25	4.7156E+19	± 0.30%	5.1996E+19	± 0.30%	1.7713E+19	± 0.46%	7.4189E+18	± 0.60%	1.2428E+20	± 0.21%	1.5733E-01
-203.50	5.4300E+19	± 0.30%	5.5481E+19	± 0.31%	1.6096E+19	± 0.51%	4.7804E+18	± 0.77%	1.3066E+20	± 0.22%	8.8036E-02
-253.50	5.5201E+19	± 0.30%	5.6847E+19	± 0.31%	1.5637E+19	± 0.52%	4.1765E+18	± 0.82%	1.3186E+20	± 0.21%	7.5659E-02
-303.50	5.3735E+19	± 0.31%	5.5992E+19	± 0.31%	1.5027E+19	± 0.52%	3.9454E+18	± 0.84%	1.2870E+20	± 0.22%	7.3424E-02
-353.50	5.1398E+19	± 0.31%	5.3829E+19	± 0.32%	1.4206E+19	± 0.54%	3.6625E+18	± 0.87%	1.2310E+20	± 0.22%	7.1256E-02
-410.75	4.8406E+19	± 0.30%	4.8593E+19	± 0.31%	1.2419E+19	± 0.53%	3.0285E+18	± 0.86%	1.1245E+20	± 0.22%	6.2564E-02
-470.25	4.2547E+19	± 0.34%	4.1161E+19	± 0.35%	1.0722E+19	± 0.60%	2.8146E+18	± 0.95%	9.7245E+19	± 0.25%	6.6152E-02
-514.75	3.3271E+19	± 0.43%	3.2640E+19	± 0.45%	9.9137E+18	± 0.73%	3.4517E+18	± 1.00%	7.9277E+19	± 0.31%	1.0375E-01

Table D-13. Four-group Neutron Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=135-151.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.2386E+19	± 0.41%	4.1360E+19	± 0.38%	1.6706E+19	± 0.55%	7.3958E+18	± 0.71%	9.7847E+19	± 0.26%	2.2837E-01
-86.75	4.1528E+19	± 0.32%	4.5015E+19	± 0.32%	1.7302E+19	± 0.47%	9.1150E+18	± 0.54%	1.1296E+20	± 0.21%	2.1949E-01
-146.25	4.7544E+19	± 0.28%	4.9540E+19	± 0.29%	1.7123E+19	± 0.44%	9.0595E+18	± 0.51%	1.2327E+20	± 0.20%	1.9055E-01
-203.50	5.5006E+19	± 0.28%	5.3181E+19	± 0.30%	1.5827E+19	± 0.49%	6.2198E+18	± 0.63%	1.3023E+20	± 0.20%	1.1307E-01
-253.50	5.5912E+19	± 0.28%	5.4178E+19	± 0.30%	1.5221E+19	± 0.49%	5.6303E+18	± 0.66%	1.3094E+20	± 0.20%	1.0070E-01
-303.50	5.4567E+19	± 0.28%	5.3732E+19	± 0.30%	1.4585E+19	± 0.50%	5.4306E+18	± 0.66%	1.2832E+20	± 0.20%	9.9521E-02
-353.50	5.2839E+19	± 0.29%	5.1286E+19	± 0.30%	1.3833E+19	± 0.52%	4.9929E+18	± 0.69%	1.2295E+20	± 0.21%	9.4492E-02
-410.75	4.9688E+19	± 0.27%	4.6597E+19	± 0.29%	1.2114E+19	± 0.50%	3.9608E+18	± 0.69%	1.1236E+20	± 0.20%	7.9713E-02
-470.25	4.3314E+19	± 0.31%	3.9112E+19	± 0.34%	1.0316E+19	± 0.58%	3.6268E+18	± 0.77%	9.6369E+19	± 0.23%	8.3733E-02
-514.75	3.4177E+19	± 0.40%	3.1239E+19	± 0.43%	9.4793E+18	± 0.70%	4.1066E+18	± 0.86%	7.9002E+19	± 0.29%	1.2016E-01

Table D-14. Four-group Neutron Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=151.5-158.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.1572E+19	± 0.47%	3.9991E+19	± 0.42%	1.6773E+19	± 0.61%	9.5581E+18	± 0.70%	9.7894E+19	± 0.28%	3.0274E-01
-86.75	3.9801E+19	± 0.36%	4.3212E+19	± 0.35%	1.7287E+19	± 0.52%	1.1841E+19	± 0.54%	1.1214E+20	± 0.23%	2.9751E-01
-146.25	4.5542E+19	± 0.32%	4.7611E+19	± 0.32%	1.7000E+19	± 0.49%	1.2152E+19	± 0.49%	1.2231E+20	± 0.21%	2.6683E-01
-203.50	5.3236E+19	± 0.32%	5.0914E+19	± 0.33%	1.6135E+19	± 0.54%	9.2637E+18	± 0.59%	1.2955E+20	± 0.22%	1.7401E-01
-253.50	5.4013E+19	± 0.32%	5.1895E+19	± 0.33%	1.5470E+19	± 0.54%	8.6431E+18	± 0.60%	1.3002E+20	± 0.22%	1.6002E-01
-303.50	5.2909E+19	± 0.32%	5.1506E+19	± 0.33%	1.4853E+19	± 0.56%	8.3870E+18	± 0.61%	1.2765E+20	± 0.22%	1.5852E-01
-353.50	5.1417E+19	± 0.33%	4.9179E+19	± 0.34%	1.4103E+19	± 0.57%	7.7719E+18	± 0.63%	1.2247E+20	± 0.23%	1.5115E-01
-410.75	4.9535E+19	± 0.30%	4.4748E+19	± 0.32%	1.2229E+19	± 0.55%	6.0986E+18	± 0.62%	1.1261E+20	± 0.22%	1.2312E-01
-470.25	4.3463E+19	± 0.35%	3.7412E+19	± 0.37%	1.0411E+19	± 0.64%	5.6317E+18	± 0.68%	9.6917E+19	± 0.25%	1.2958E-01
-514.75	3.4542E+19	± 0.45%	2.9831E+19	± 0.49%	9.4358E+18	± 0.78%	5.9839E+18	± 0.80%	7.9792E+19	± 0.31%	1.7324E-01

Table D-15. Four-group Neutron Spectrum ($m^2 s^{-1}$) in the Lower Fuel Element for R=158.5-164 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	3.0344E+19 ±	0.49%	3.9424E+19 ±	0.43%	1.6789E+19 ±	0.63%	1.1597E+19 ±	0.65%	9.8154E+19 ±	0.28%	3.8217E-01
-86.75	3.7720E+19 ±	0.37%	4.2194E+19 ±	0.36%	1.7287E+19 ±	0.52%	1.4118E+19 ±	0.50%	1.1132E+20 ±	0.23%	3.7429E-01
-146.25	4.3214E+19 ±	0.33%	4.6362E+19 ±	0.32%	1.7248E+19 ±	0.49%	1.4749E+19 ±	0.46%	1.2157E+20 ±	0.21%	3.4129E-01
-203.50	5.1070E+19 ±	0.33%	4.9392E+19 ±	0.34%	1.6307E+19 ±	0.55%	1.2028E+19 ±	0.52%	1.2880E+20 ±	0.22%	2.3552E-01
-253.50	5.2107E+19 ±	0.33%	5.0525E+19 ±	0.34%	1.5856E+19 ±	0.55%	1.1513E+19 ±	0.54%	1.3000E+20 ±	0.22%	2.2095E-01
-303.50	5.1121E+19 ±	0.33%	4.9911E+19 ±	0.34%	1.5065E+19 ±	0.56%	1.1075E+19 ±	0.54%	1.2717E+20 ±	0.22%	2.1665E-01
-353.50	4.9391E+19 ±	0.34%	4.7992E+19 ±	0.33%	1.4371E+19 ±	0.58%	1.0425E+19 ±	0.55%	1.2218E+20 ±	0.23%	2.1107E-01
-410.75	4.8369E+19 ±	0.31%	4.3439E+19 ±	0.33%	1.2661E+19 ±	0.55%	8.5237E+18 ±	0.53%	1.1279E+20 ±	0.22%	1.7622E-01
-470.25	4.2380E+19 ±	0.36%	3.6517E+19 ±	0.38%	1.0648E+19 ±	0.64%	7.9262E+18 ±	0.58%	9.7472E+19 ±	0.25%	1.8703E-01
-514.75	3.4211E+19 ±	0.46%	2.9000E+19 ±	0.50%	9.6287E+18 ±	0.80%	8.3874E+18 ±	0.69%	8.1226E+19 ±	0.31%	2.4517E-01

Table D-16. Four-group Neutron Spectrum ($m^2 s^{-1}$) in the Lower Fuel Element for R=164-168 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-42.25	2.8278E+19 ±	0.52%	3.8707E+19 ±	0.45%	1.6874E+19 ±	0.64%	1.4013E+19 ±	0.62%	9.7871E+19 ±	0.29%	4.9554E-01
-86.75	3.5055E+19 ±	0.40%	4.1259E+19 ±	0.37%	1.7452E+19 ±	0.54%	1.6646E+19 ±	0.48%	1.1041E+20 ±	0.24%	4.7485E-01
-146.25	4.0214E+19 ±	0.35%	4.5327E+19 ±	0.33%	1.7550E+19 ±	0.50%	1.7526E+19 ±	0.44%	1.2062E+20 ±	0.21%	4.3581E-01
-203.50	4.7641E+19 ±	0.35%	4.6319E+19 ±	0.35%	1.6580E+19 ±	0.56%	1.5623E+19 ±	0.48%	1.2816E+20 ±	0.22%	3.2793E-01
-253.50	4.8724E+19 ±	0.35%	4.9291E+19 ±	0.35%	1.6087E+19 ±	0.56%	1.4999E+19 ±	0.49%	1.2910E+20 ±	0.22%	3.0783E-01
-303.50	4.7707E+19 ±	0.35%	4.8588E+19 ±	0.35%	1.5575E+19 ±	0.58%	1.4366E+19 ±	0.50%	1.2624E+20 ±	0.23%	3.0114E-01
-353.50	4.6227E+19 ±	0.36%	4.6570E+19 ±	0.36%	1.4599E+19 ±	0.59%	1.3704E+19 ±	0.51%	1.2110E+20 ±	0.23%	2.9645E-01
-410.75	4.5496E+19 ±	0.33%	4.2486E+19 ±	0.34%	1.2918E+19 ±	0.57%	1.1901E+19 ±	0.47%	1.1280E+20 ±	0.22%	2.6158E-01
-470.25	4.0242E+19 ±	0.37%	3.5699E+19 ±	0.40%	1.1007E+19 ±	0.65%	1.1273E+19 ±	0.52%	9.8221E+19 ±	0.25%	2.8013E-01
-514.75	3.2224E+19 ±	0.49%	2.8298E+19 ±	0.52%	9.6908E+18 ±	0.82%	1.1644E+19 ±	0.62%	8.1857E+19 ±	0.32%	3.6134E-01

Table D-17. Four-group Neutron Spectrum (m^2s^{-1}) in the Core Support Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2088.45	2.9515E+15	± 4.85%	7.6283E+15	± 3.64%	3.8924E+15	± 5.33%	1.3017E+17	± 3.60%	1.4464E+17	± 3.27%	4.4102E+01
1820.00	3.2398E+15	± 7.01%	8.2447E+15	± 5.56%	4.7962E+15	± 6.66%	2.4054E+17	± 3.63%	2.5682E+17	± 3.42%	7.4244E+01
1689.50	3.2215E+15	± 8.98%	9.0665E+15	± 5.75%	5.6866E+15	± 7.65%	2.7869E+17	± 4.05%	2.9667E+17	± 3.82%	8.6510E+01
1589.50	3.5026E+15	± 8.67%	9.9171E+15	± 6.01%	7.1494E+15	± 6.97%	2.5192E+17	± 4.29%	2.7249E+17	± 3.99%	7.1925E+01
1495.00	3.6943E+15	± 7.78%	1.3454E+16	± 5.06%	1.0045E+16	± 7.07%	2.2779E+17	± 4.15%	2.5498E+17	± 3.74%	6.1659E+01
1395.00	7.9454E+15	± 5.84%	2.5392E+16	± 3.67%	1.3620E+16	± 6.73%	2.3049E+17	± 4.41%	2.7745E+17	± 3.73%	2.9010E+01
1302.00	2.2909E+16	± 3.42%	4.6478E+16	± 2.76%	1.8069E+16	± 4.51%	2.1461E+17	± 4.90%	3.0207E+17	± 3.55%	9.3683E+00
1202.00	3.1252E+16	± 2.68%	6.3947E+16	± 2.21%	2.5933E+16	± 4.99%	2.9473E+17	± 3.77%	4.1587E+17	± 2.74%	9.4310E+00
1095.00	3.2263E+16	± 4.76%	7.6845E+16	± 2.99%	3.9159E+16	± 9.19%	6.0892E+17	± 2.89%	7.5719E+17	± 2.42%	1.8874E+01
995.00	3.4727E+16	± 4.45%	1.0517E+17	± 3.96%	7.6230E+16	± 6.79%	1.2637E+18	± 2.16%	1.4798E+18	± 1.91%	3.6390E+01
914.50	4.9640E+16	± 6.15%	1.8518E+17	± 5.02%	1.7839E+17	± 6.13%	2.2511E+18	± 1.90%	2.6643E+18	± 1.73%	4.5348E+01
864.50	6.8851E+16	± 7.38%	2.7164E+17	± 4.99%	3.0971E+17	± 5.51%	3.1307E+18	± 1.85%	3.7809E+18	± 1.66%	4.5470E+01
820.00	1.0076E+17	± 6.35%	4.2591E+17	± 3.80%	4.8987E+17	± 3.95%	4.1504E+18	± 1.51%	5.1669E+18	± 1.34%	4.1191E+01
770.00	1.5629E+17	± 5.77%	8.0833E+17	± 3.11%	8.6029E+17	± 3.04%	5.5162E+18	± 1.33%	7.3411E+18	± 1.15%	3.5295E+01
720.00	2.9477E+17	± 4.93%	1.5021E+18	± 2.35%	1.5872E+18	± 2.35%	6.9682E+18	± 1.19%	1.0352E+19	± 0.98%	2.3640E+01
670.00	6.0907E+17	± 3.67%	2.9088E+18	± 1.75%	2.5632E+18	± 1.83%	8.0188E+18	± 1.11%	1.4100E+19	± 0.86%	1.3166E+01
620.00	1.2180E+18	± 2.61%	5.4417E+18	± 1.30%	3.9504E+18	± 1.46%	8.2430E+18	± 1.10%	1.8853E+19	± 0.74%	6.7675E+00
563.00	2.7225E+18	± 1.60%	1.0061E+19	± 0.90%	5.7174E+18	± 1.12%	7.2702E+18	± 1.08%	2.5771E+19	± 0.60%	2.6704E+00
513.50	4.7923E+18	± 1.46%	1.4621E+19	± 0.87%	7.3070E+18	± 1.20%	5.8611E+18	± 1.36%	3.2581E+19	± 0.61%	1.2230E+00
470.00	6.5519E+18	± 1.13%	1.8824E+19	± 0.71%	8.6032E+18	± 0.98%	5.2831E+18	± 1.29%	3.9262E+19	± 0.51%	8.0634E-01
420.00	7.9346E+18	± 1.03%	2.3244E+19	± 0.63%	1.0160E+19	± 0.90%	5.3166E+18	± 1.31%	4.6655E+19	± 0.48%	6.7006E-01
370.00	9.1970E+18	± 0.95%	2.7005E+19	± 0.59%	1.1611E+19	± 0.85%	5.5528E+18	± 1.26%	5.3367E+19	± 0.45%	6.0376E-01
320.00	9.8883E+18	± 0.92%	2.9653E+19	± 0.57%	1.2812E+19	± 0.80%	6.1377E+18	± 1.20%	5.8491E+19	± 0.42%	6.2070E-01
270.00	1.0884E+19	± 0.88%	3.1821E+19	± 0.55%	1.3809E+19	± 0.77%	6.7198E+18	± 1.14%	6.3234E+19	± 0.41%	6.1740E-01
220.00	1.1361E+19	± 0.86%	3.3523E+19	± 0.54%	1.4809E+19	± 0.75%	7.8827E+18	± 1.06%	6.7575E+19	± 0.40%	6.9386E-01
170.00	1.1905E+19	± 0.84%	3.4727E+19	± 0.52%	1.6392E+19	± 0.72%	1.0297E+19	± 0.94%	7.3321E+19	± 0.38%	8.6492E-01
125.00	1.2064E+19	± 0.90%	3.5587E+19	± 0.55%	1.9059E+19	± 0.73%	1.4348E+19	± 0.86%	8.1058E+19	± 0.39%	1.1893E+00
95.00	1.2170E+19	± 1.14%	3.5962E+19	± 0.67%	2.0142E+19	± 0.86%	1.6417E+19	± 0.98%	8.4691E+19	± 0.46%	1.3489E+00
75.00	1.2245E+19	± 1.12%	3.6693E+19	± 0.67%	2.0788E+19	± 0.85%	1.7709E+19	± 0.94%	8.7435E+19	± 0.45%	1.4462E+00
55.00	1.2274E+19	± 1.11%	3.7085E+19	± 0.67%	2.1309E+19	± 0.84%	1.8276E+19	± 0.92%	8.8944E+19	± 0.45%	1.4890E+00
35.00	1.2459E+19	± 1.12%	3.7671E+19	± 0.66%	2.1398E+19	± 0.84%	1.8097E+19	± 0.93%	8.9625E+19	± 0.45%	1.4526E+00
20.00	1.3497E+19	± 1.31%	3.8305E+19	± 0.77%	2.1222E+19	± 1.01%	1.7755E+19	± 1.11%	9.0779E+19	± 0.52%	1.3155E+00
7.50	1.4346E+19	± 1.14%	3.9154E+19	± 0.70%	2.1033E+19	± 0.91%	1.7009E+19	± 1.04%	9.1543E+19	± 0.48%	1.1856E+00
-7.50	1.6420E+19	± 1.05%	4.0498E+19	± 0.69%	2.0688E+19	± 0.90%	1.4702E+19	± 1.07%	9.2307E+19	± 0.47%	8.9537E-01
-20.00	1.9321E+19	± 1.09%	4.0818E+19	± 0.75%	2.0098E+19	± 1.01%	1.1887E+19	± 1.22%	9.2124E+19	± 0.51%	6.1520E-01
-35.00	2.3901E+19	± 0.82%	4.2720E+19	± 0.61%	1.9704E+19	± 0.84%	1.0966E+19	± 1.06%	9.7292E+19	± 0.42%	4.5882E-01
-55.00	2.8477E+19	± 0.76%	4.4890E+19	± 0.60%	1.9889E+19	± 0.85%	1.0705E+19	± 1.07%	1.0396E+20	± 0.41%	3.7593E-01
-75.00	3.1474E+19	± 0.73%	4.6522E+19	± 0.59%	2.0020E+19	± 0.85%	1.0596E+19	± 1.08%	1.0861E+20	± 0.40%	3.3665E-01
-95.00	3.3124E+19	± 0.70%	4.8658E+19	± 0.57%	2.0035E+19	± 0.84%	1.0766E+19	± 1.08%	1.1258E+20	± 0.39%	3.2502E-01
-125.00	3.5891E+19	± 0.54%	5.1715E+19	± 0.46%	2.0458E+19	± 0.68%	1.0614E+19	± 0.88%	1.1868E+20	± 0.32%	2.9572E-01
-170.00	4.0455E+19	± 0.48%	5.5858E+19	± 0.41%	1.9904E+19	± 0.63%	9.3137E+18	± 0.86%	1.2553E+20	± 0.29%	2.3022E-01
-220.00	4.4240E+19	± 0.46%	5.8397E+19	± 0.40%	1.9077E+19	± 0.64%	7.8287E+18	± 0.90%	1.2954E+20	± 0.28%	1.7696E-01

Table D-17. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-270.00	4.4323E+19	± 0.45%	5.9437E+19	± 0.39%	1.8470E+19	± 0.64%	7.2149E+18	± 0.94%	1.2945E+20	± 0.28%	1.6278E-01
-320.00	4.3409E+19	± 0.46%	5.8313E+19	± 0.40%	1.7762E+19	± 0.65%	6.6669E+18	± 0.98%	1.2615E+20	± 0.29%	1.5358E-01
-370.00	4.1584E+19	± 0.47%	5.5259E+19	± 0.41%	1.6401E+19	± 0.68%	6.2882E+18	± 1.00%	1.1953E+20	± 0.29%	1.5122E-01
-420.00	3.8990E+19	± 0.49%	4.9772E+19	± 0.43%	1.4715E+19	± 0.71%	5.9446E+18	± 1.02%	1.0942E+20	± 0.31%	1.5247E-01
-470.00	3.4329E+19	± 0.52%	4.2987E+19	± 0.46%	1.3123E+19	± 0.77%	6.2775E+18	± 1.00%	9.6717E+19	± 0.33%	1.8286E-01
-513.50	2.6949E+19	± 0.65%	3.4221E+19	± 0.57%	1.1960E+19	± 0.89%	8.4270E+18	± 0.97%	8.1556E+19	± 0.39%	3.1271E-01
-563.50	1.1570E+19	± 0.84%	2.3502E+19	± 0.59%	1.1164E+19	± 0.80%	1.9683E+19	± 0.64%	6.5919E+19	± 0.39%	1.7012E+00
-620.00	3.6558E+18	± 1.58%	1.2553E+19	± 0.87%	8.6929E+18	± 0.99%	2.9025E+19	± 0.62%	5.3927E+19	± 0.47%	7.9395E+00
-670.00	1.4263E+18	± 2.44%	6.6315E+18	± 1.18%	6.1000E+18	± 1.20%	3.0262E+19	± 0.60%	4.4420E+19	± 0.52%	2.1216E+01
-720.00	6.6818E+17	± 3.53%	3.3675E+18	± 1.64%	3.8378E+18	± 1.50%	2.8931E+19	± 0.61%	3.6804E+19	± 0.56%	4.3298E+01
-770.00	3.2296E+17	± 4.85%	1.7511E+18	± 2.22%	2.2899E+18	± 1.94%	2.5763E+19	± 0.64%	3.0127E+19	± 0.61%	7.9773E+01
-820.00	1.6842E+17	± 5.84%	9.2467E+17	± 2.90%	1.3015E+18	± 2.50%	2.2350E+19	± 0.68%	2.4745E+19	± 0.65%	1.3270E+02
-864.50	1.0749E+17	± 6.57%	5.1360E+17	± 3.95%	7.9968E+17	± 3.52%	1.9274E+19	± 0.75%	2.0695E+19	± 0.74%	1.7931E+02
-914.50	7.7159E+16	± 7.13%	3.2156E+17	± 3.96%	4.6676E+17	± 3.76%	1.6224E+19	± 0.73%	1.7089E+19	± 0.72%	2.1027E+02
-995.00	4.6858E+16	± 5.51%	1.5506E+17	± 3.59%	2.1008E+17	± 4.38%	1.2290E+19	± 0.73%	1.2703E+19	± 0.71%	2.6229E+02
-1095.00	3.5986E+16	± 2.74%	9.9215E+16	± 3.27%	9.1990E+16	± 6.12%	8.6850E+18	± 0.83%	8.9121E+18	± 0.81%	2.4135E+02
-1202.00	3.3504E+16	± 2.72%	7.7012E+16	± 2.57%	5.1019E+16	± 4.34%	6.1511E+18	± 0.91%	6.3127E+18	± 0.89%	1.8360E+02
-1302.00	3.0720E+16	± 3.15%	6.9484E+16	± 2.39%	3.9905E+16	± 3.20%	4.4890E+18	± 1.12%	4.6291E+18	± 1.09%	1.4613E+02
-1395.00	2.8677E+16	± 3.00%	6.4832E+16	± 2.31%	3.7922E+16	± 3.23%	3.4959E+18	± 1.19%	3.6273E+18	± 1.15%	1.2191E+02
-1495.00	2.7523E+16	± 3.09%	6.3277E+16	± 2.36%	3.1649E+16	± 3.12%	2.6151E+18	± 1.31%	2.7375E+18	± 1.25%	9.5013E+01
-1589.50	2.7811E+16	± 3.27%	5.9626E+16	± 2.53%	3.0662E+16	± 3.39%	1.9980E+18	± 1.49%	2.1161E+18	± 1.41%	7.1840E+01
-1689.50	2.5729E+16	± 3.07%	5.7613E+16	± 2.41%	2.9699E+16	± 3.25%	1.5166E+18	± 1.65%	1.6297E+18	± 1.54%	5.8946E+01
-1820.00	2.5284E+16	± 2.57%	5.3967E+16	± 2.18%	2.6263E+16	± 2.94%	9.4359E+17	± 1.80%	1.0491E+18	± 1.63%	3.7320E+01
-1968.60	2.3438E+16	± 2.83%	4.0913E+16	± 2.48%	1.7864E+16	± 3.67%	4.4773E+17	± 2.35%	5.2995E+17	± 2.02%	1.9103E+01

Table D-18. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Fuel Element Inner Sideplate. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
533.50	1.0627E+19	± 0.60%	1.5750E+19	± 0.51%	6.5915E+18	± 0.72%	6.8698E+18	± 0.73%	3.9838E+19	± 0.35%	6.4646E-01
470.00	1.8736E+19	± 0.53%	2.3296E+19	± 0.48%	7.8855E+18	± 0.76%	3.5991E+18	± 1.04%	5.3517E+19	± 0.34%	1.9209E-01
420.00	2.2006E+19	± 0.49%	2.7953E+19	± 0.44%	8.9021E+18	± 0.70%	3.5409E+18	± 1.03%	6.2402E+19	± 0.31%	1.6090E-01
370.00	2.4765E+19	± 0.46%	3.2105E+19	± 0.41%	1.0062E+19	± 0.65%	3.6423E+18	± 1.02%	7.0573E+19	± 0.29%	1.4707E-01
320.00	2.7195E+19	± 0.44%	3.5608E+19	± 0.39%	1.1011E+19	± 0.63%	3.8577E+18	± 0.97%	7.7672E+19	± 0.28%	1.4186E-01
270.00	2.9362E+19	± 0.42%	3.8405E+19	± 0.37%	1.2021E+19	± 0.61%	4.1600E+18	± 0.94%	8.3948E+19	± 0.27%	1.4168E-01
220.00	3.0766E+19	± 0.41%	4.0025E+19	± 0.36%	1.2787E+19	± 0.59%	4.6320E+18	± 0.88%	8.8209E+19	± 0.26%	1.5056E-01
170.00	3.2422E+19	± 0.40%	4.1211E+19	± 0.36%	1.3205E+19	± 0.58%	5.3740E+18	± 0.82%	9.2212E+19	± 0.25%	1.6575E-01
125.00	3.3148E+19	± 0.43%	4.0980E+19	± 0.39%	1.3822E+19	± 0.61%	6.2259E+18	± 0.82%	9.4176E+19	± 0.27%	1.8782E-01
95.00	3.3042E+19	± 0.53%	4.0584E+19	± 0.47%	1.4403E+19	± 0.73%	6.8652E+18	± 0.99%	9.4895E+19	± 0.32%	2.0777E-01
75.00	3.2345E+19	± 0.54%	4.0015E+19	± 0.48%	1.4712E+19	± 0.73%	7.2845E+18	± 0.96%	9.4357E+19	± 0.32%	2.2521E-01
55.00	3.0754E+19	± 0.55%	3.9376E+19	± 0.48%	1.5187E+19	± 0.73%	7.7019E+18	± 0.94%	9.3017E+19	± 0.33%	2.5044E-01
35.00	2.7587E+19	± 0.58%	3.8405E+19	± 0.49%	1.5519E+19	± 0.71%	8.9014E+18	± 0.89%	9.0413E+19	± 0.33%	3.2267E-01
20.00	2.2800E+19	± 0.77%	3.8149E+19	± 0.59%	1.6254E+19	± 0.86%	1.0703E+19	± 1.00%	8.7906E+19	± 0.40%	4.6942E-01
7.50	2.0151E+19	± 0.73%	3.8392E+19	± 0.54%	1.7022E+19	± 0.76%	1.3400E+19	± 0.85%	8.8965E+19	± 0.36%	6.6497E-01

Table D-19. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element Outer Sideplate. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($E+05 - 17.0E+06$ eV)		Group 2 ($100.0 - E+05$ eV)		Group 3 ($0.625 - 100.0$ eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-7.50	1.9271E+19	± 0.74%	3.7547E+19	± 0.54%	1.7092E+19	± 0.76%	1.4778E+19	± 0.81%	8.8687E+19	± 0.36%	7.6686E-01
-20.00	2.0147E+19	± 0.80%	3.7585E+19	± 0.59%	1.6781E+19	± 0.86%	1.4673E+19	± 0.88%	8.9187E+19	± 0.39%	7.2830E-01
-35.00	2.3178E+19	± 0.61%	3.8167E+19	± 0.50%	1.6861E+19	± 0.71%	1.5826E+19	± 0.70%	9.4032E+19	± 0.32%	6.8283E-01
-55.00	2.6288E+19	± 0.57%	3.8880E+19	± 0.49%	1.7587E+19	± 0.71%	1.7398E+19	± 0.66%	1.0015E+20	± 0.31%	6.6182E-01
-75.00	2.8833E+19	± 0.54%	3.9855E+19	± 0.48%	1.7438E+19	± 0.70%	1.8816E+19	± 0.64%	1.0494E+20	± 0.30%	6.5258E-01
-95.00	3.0463E+19	± 0.53%	4.0961E+19	± 0.47%	1.7766E+19	± 0.70%	1.9530E+19	± 0.63%	1.0872E+20	± 0.30%	6.4108E-01
-125.00	3.2704E+19	± 0.41%	4.2965E+19	± 0.38%	1.7883E+19	± 0.57%	2.0289E+19	± 0.50%	1.1384E+20	± 0.24%	6.2039E-01
-170.00	3.6663E+19	± 0.36%	4.5679E+19	± 0.34%	1.7533E+19	± 0.53%	2.0027E+19	± 0.47%	1.1990E+20	± 0.22%	5.4624E-01
-220.00	4.0644E+19	± 0.34%	4.7684E+19	± 0.34%	1.6947E+19	± 0.54%	1.9088E+19	± 0.47%	1.2436E+20	± 0.22%	4.6965E-01
-270.00	4.0891E+19	± 0.34%	4.8283E+19	± 0.33%	1.6423E+19	± 0.55%	1.8426E+19	± 0.48%	1.2402E+20	± 0.22%	4.5061E-01
-320.00	3.9999E+19	± 0.34%	4.7256E+19	± 0.34%	1.5695E+19	± 0.56%	1.7538E+19	± 0.49%	1.2049E+20	± 0.22%	4.3847E-01
-370.00	3.8816E+19	± 0.35%	4.4626E+19	± 0.35%	1.4699E+19	± 0.58%	1.6599E+19	± 0.50%	1.1474E+20	± 0.22%	4.2764E-01
-420.00	3.7360E+19	± 0.35%	4.0901E+19	± 0.36%	1.3090E+19	± 0.61%	1.5418E+19	± 0.51%	1.0677E+20	± 0.23%	4.1270E-01
-470.00	3.3205E+19	± 0.37%	3.4899E+19	± 0.39%	1.1441E+19	± 0.65%	1.4924E+19	± 0.52%	9.4468E+19	± 0.25%	4.4944E-01
-533.50	1.8672E+19	± 0.43%	2.3990E+19	± 0.41%	9.7396E+18	± 0.62%	1.9829E+19	± 0.42%	7.2230E+19	± 0.26%	1.0620E+00
-608.50	3.6381E+18	± 1.03%	1.0931E+19	± 0.62%	7.3805E+18	± 0.73%	3.1819E+19	± 0.41%	5.3769E+19	± 0.32%	8.7461E+00
-670.00	1.0852E+18	± 2.12%	4.9138E+18	± 1.05%	4.5835E+18	± 1.04%	3.2484E+19	± 0.46%	4.3067E+19	± 0.41%	2.9935E+01
-720.00	4.7235E+17	± 3.02%	2.4016E+18	± 1.47%	2.8154E+18	± 1.32%	2.9919E+19	± 0.48%	3.5609E+19	± 0.44%	6.3342E+01
-770.00	2.4137E+17	± 4.09%	1.2450E+18	± 1.98%	1.7036E+18	± 1.68%	2.6397E+19	± 0.50%	2.9587E+19	± 0.48%	1.0937E+02
-820.00	1.3782E+17	± 4.78%	6.5792E+17	± 2.68%	9.9855E+17	± 2.19%	2.2809E+19	± 0.53%	2.4603E+19	± 0.51%	1.6550E+02
-864.50	9.5779E+16	± 4.92%	4.1274E+17	± 3.34%	6.0309E+17	± 3.00%	1.9859E+19	± 0.58%	2.0970E+19	± 0.58%	2.0734E+02
-914.50	6.5445E+16	± 5.59%	2.3771E+17	± 3.47%	3.3788E+17	± 3.21%	1.6759E+19	± 0.57%	1.7400E+19	± 0.56%	2.5607E+02
-995.00	3.0377E+16	± 5.31%	1.0812E+17	± 3.77%	1.4906E+17	± 3.74%	1.2829E+19	± 0.57%	1.3116E+19	± 0.57%	4.2232E+02
-1095.00	1.7643E+16	± 3.42%	6.2017E+16	± 3.97%	6.2718E+16	± 4.28%	9.2826E+18	± 0.64%	9.4250E+18	± 0.64%	5.2614E+02
-1202.00	1.7076E+16	± 4.21%	4.6174E+16	± 2.55%	3.8202E+16	± 3.54%	6.6481E+18	± 0.72%	6.7496E+18	± 0.71%	3.8932E+02
-1302.00	9.9040E+15	± 4.15%	3.5293E+16	± 2.49%	2.8562E+16	± 2.86%	4.8985E+18	± 0.86%	4.9722E+18	± 0.85%	4.9460E+02
-1395.00	8.9725E+15	± 4.32%	3.1636E+16	± 2.42%	2.4430E+16	± 2.76%	3.7658E+18	± 0.92%	3.8308E+18	± 0.91%	4.1970E+02
-1495.00	7.5649E+15	± 4.41%	2.9172E+16	± 2.56%	2.2912E+16	± 2.79%	2.8538E+18	± 1.02%	2.9134E+18	± 1.00%	3.7724E+02
-1589.50	7.9944E+15	± 4.64%	2.9251E+16	± 2.70%	2.1959E+16	± 3.01%	2.1653E+18	± 1.17%	2.2245E+18	± 1.14%	2.7085E+02
-1689.50	5.4207E+15	± 5.01%	2.5745E+16	± 2.64%	2.2009E+16	± 2.88%	1.6210E+18	± 1.26%	1.6741E+18	± 1.22%	2.9903E+02
-1820.00	4.5753E+15	± 4.68%	2.3052E+16	± 2.45%	1.8864E+16	± 2.72%	1.0217E+18	± 1.40%	1.0682E+18	± 1.34%	2.2331E+02
-1968.60	3.8790E+15	± 4.97%	1.8552E+16	± 2.83%	1.2568E+16	± 3.27%	4.7800E+17	± 1.87%	5.1300E+17	± 1.75%	1.2323E+02

Table D-20. Four-group Neutron Spectrum (m^2s^{-1}) in the Inner Core Pressure Boundary Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2088.45	5.4674E+14	± 8.03%	2.2943E+15	± 4.74%	2.0500E+15	± 4.71%	1.4775E+17	± 2.32%	1.5264E+17	± 2.26%	2.7023E+02
1820.00	6.6085E+14	± 11.28%	2.3184E+15	± 6.88%	2.5832E+15	± 6.41%	2.9089E+17	± 2.51%	2.9645E+17	± 2.47%	4.4018E+02
1689.50	6.6406E+14	± 12.53%	2.5870E+15	± 6.83%	2.6968E+15	± 6.83%	3.0635E+17	± 2.57%	3.1229E+17	± 2.52%	4.6132E+02
1589.50	1.0521E+15	± 10.42%	3.5024E+15	± 6.87%	3.1714E+15	± 6.65%	2.8267E+17	± 2.83%	2.9040E+17	± 2.76%	2.6868E+02
1495.00	1.1842E+15	± 9.86%	4.3320E+15	± 5.64%	4.1739E+15	± 5.74%	2.5877E+17	± 2.95%	2.6846E+17	± 2.85%	2.1852E+02
1395.00	1.4378E+15	± 9.60%	5.6319E+15	± 4.73%	5.9389E+15	± 4.75%	2.7079E+17	± 2.78%	2.8380E+17	± 2.66%	1.8833E+02
1302.00	2.3042E+15	± 7.61%	1.0558E+16	± 4.10%	9.1339E+15	± 5.36%	3.5807E+17	± 2.63%	3.8006E+17	± 2.49%	1.5540E+02
1202.00	4.5868E+15	± 5.41%	1.5574E+16	± 3.63%	1.3367E+16	± 4.30%	5.6379E+17	± 2.03%	5.9731E+17	± 1.92%	1.2291E+02
1095.00	6.9609E+15	± 8.97%	2.1718E+16	± 5.30%	2.4255E+16	± 7.13%	1.0740E+18	± 1.62%	1.1270E+18	± 1.56%	1.5430E+02
995.00	1.3762E+16	± 14.60%	4.3756E+16	± 5.15%	6.7665E+16	± 5.19%	2.1603E+18	± 1.18%	2.2855E+18	± 1.15%	1.5698E+02
914.50	2.1649E+16	± 9.22%	9.6880E+16	± 4.48%	1.7201E+17	± 4.23%	3.8706E+18	± 1.04%	4.1611E+18	± 1.01%	1.7879E+02
864.50	4.2188E+16	± 7.99%	1.8804E+17	± 4.35%	3.0144E+17	± 3.88%	5.6690E+18	± 0.98%	6.2007E+18	± 0.93%	1.3438E+02
820.00	6.5880E+16	± 5.82%	3.3495E+17	± 3.25%	5.1618E+17	± 2.73%	7.8735E+18	± 0.79%	8.7905E+18	± 0.75%	1.1951E+02
770.00	1.2903E+17	± 5.17%	6.8951E+17	± 2.39%	9.1959E+17	± 2.10%	1.0951E+19	± 0.68%	1.2690E+19	± 0.63%	8.4876E+01
720.00	2.7320E+17	± 3.75%	1.3633E+18	± 1.76%	1.5381E+18	± 1.60%	1.4264E+19	± 0.60%	1.7439E+19	± 0.55%	5.2213E+01
670.00	5.9901E+17	± 2.61%	2.7613E+18	± 1.27%	2.6019E+18	± 1.24%	1.6890E+19	± 0.55%	2.2853E+19	± 0.49%	2.8197E+01
608.50	2.1387E+18	± 1.22%	6.3313E+18	± 0.73%	4.2931E+18	± 0.84%	1.7773E+19	± 0.48%	3.0536E+19	± 0.38%	8.3101E+00
533.50	1.0695E+19	± 0.49%	1.3759E+19	± 0.47%	5.9811E+18	± 0.66%	1.2654E+19	± 0.45%	4.3090E+19	± 0.28%	1.1831E+00
470.00	1.9583E+19	± 0.42%	2.0295E+19	± 0.44%	7.2739E+18	± 0.68%	1.0625E+19	± 0.53%	5.7777E+19	± 0.27%	5.4255E-01
420.00	2.2937E+19	± 0.39%	2.4679E+19	± 0.40%	8.4413E+18	± 0.63%	1.1311E+19	± 0.52%	6.7369E+19	± 0.25%	4.9313E-01
370.00	2.6387E+19	± 0.36%	2.8444E+19	± 0.37%	9.4215E+18	± 0.60%	1.1767E+19	± 0.50%	7.6020E+19	± 0.23%	4.4595E-01
320.00	2.8942E+19	± 0.35%	3.1325E+19	± 0.35%	1.0320E+19	± 0.57%	1.2321E+19	± 0.49%	8.2907E+19	± 0.22%	4.2571E-01
270.00	3.0958E+19	± 0.34%	3.3627E+19	± 0.34%	1.1120E+19	± 0.55%	1.2759E+19	± 0.48%	8.8464E+19	± 0.21%	4.1215E-01
220.00	3.2457E+19	± 0.33%	3.5159E+19	± 0.33%	1.1665E+19	± 0.54%	1.3283E+19	± 0.47%	9.2564E+19	± 0.21%	4.0924E-01
170.00	3.3784E+19	± 0.32%	3.5750E+19	± 0.33%	1.1916E+19	± 0.53%	1.3581E+19	± 0.46%	9.5031E+19	± 0.21%	4.0200E-01
125.00	3.4546E+19	± 0.34%	3.5092E+19	± 0.35%	1.2042E+19	± 0.57%	1.4244E+19	± 0.49%	9.5923E+19	± 0.22%	4.1231E-01
95.00	3.4345E+19	± 0.43%	3.4282E+19	± 0.44%	1.2227E+19	± 0.69%	1.4892E+19	± 0.60%	9.5747E+19	± 0.27%	4.3359E-01
75.00	3.3365E+19	± 0.43%	3.3164E+19	± 0.45%	1.2253E+19	± 0.69%	1.5679E+19	± 0.58%	9.4461E+19	± 0.27%	4.6993E-01
55.00	3.1433E+19	± 0.45%	3.1735E+19	± 0.45%	1.2461E+19	± 0.69%	1.7006E+19	± 0.56%	9.2634E+19	± 0.27%	5.4101E-01
35.00	2.6742E+19	± 0.48%	3.0152E+19	± 0.47%	1.2802E+19	± 0.68%	1.8938E+19	± 0.53%	8.8633E+19	± 0.28%	7.0818E-01
20.00	1.9882E+19	± 0.68%	2.8738E+19	± 0.57%	1.3407E+19	± 0.81%	2.2104E+19	± 0.59%	8.4132E+19	± 0.34%	1.1117E+00
7.50	1.5323E+19	± 0.70%	2.7739E+19	± 0.53%	1.3885E+19	± 0.72%	2.7266E+19	± 0.51%	8.4213E+19	± 0.31%	1.7794E+00
-7.50	1.1802E+19	± 0.84%	2.6390E+19	± 0.58%	1.4503E+19	± 0.75%	3.1455E+19	± 0.51%	8.4149E+19	± 0.33%	2.6653E+00
-20.00	1.0079E+19	± 1.01%	2.5278E+19	± 0.65%	1.4818E+19	± 0.84%	3.5097E+19	± 0.55%	8.5272E+19	± 0.37%	3.4823E+00
-35.00	8.7033E+18	± 0.89%	2.4221E+19	± 0.56%	1.4810E+19	± 0.69%	3.7740E+19	± 0.44%	8.5474E+19	± 0.31%	4.3363E+00
-55.00	7.6016E+18	± 0.94%	2.3376E+19	± 0.56%	1.5065E+19	± 0.68%	4.0703E+19	± 0.43%	8.6745E+19	± 0.31%	5.3545E+00
-75.00	7.3871E+18	± 0.93%	2.2767E+19	± 0.56%	1.5056E+19	± 0.68%	4.3191E+19	± 0.42%	8.8402E+19	± 0.31%	5.8469E+00
-95.00	7.3626E+18	± 0.93%	2.2613E+19	± 0.56%	1.5048E+19	± 0.68%	4.4489E+19	± 0.42%	8.9513E+19	± 0.30%	6.0426E+00
-125.00	7.4852E+18	± 0.72%	2.2793E+19	± 0.46%	1.5061E+19	± 0.55%	4.6178E+19	± 0.35%	9.1517E+19	± 0.25%	6.1693E+00
-170.00	8.0821E+18	± 0.63%	2.3688E+19	± 0.42%	1.5206E+19	± 0.51%	4.7947E+19	± 0.33%	9.4923E+19	± 0.23%	5.9325E+00
-220.00	8.4304E+18	± 0.62%	2.4503E+19	± 0.41%	1.5163E+19	± 0.51%	4.8529E+19	± 0.33%	9.6626E+19	± 0.23%	5.7565E+00
-270.00	8.6069E+18	± 0.60%	2.4744E+19	± 0.41%	1.4817E+19	± 0.52%	4.7940E+19	± 0.33%	9.6108E+19	± 0.23%	5.5700E+00

Table D-20. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
-320.00	8.5075E+18	± 0.61%	2.4289E+19	± 0.41%	1.4090E+19	± 0.53%	4.6599E+19	± 0.33%	9.3487E+19	± 0.24%	5.4775E+00
-370.00	8.1700E+18	± 0.62%	2.3088E+19	± 0.42%	1.3387E+19	± 0.55%	4.4645E+19	± 0.34%	8.9289E+19	± 0.24%	5.4645E+00
-420.00	7.4738E+18	± 0.65%	2.0967E+19	± 0.44%	1.2147E+19	± 0.57%	4.2171E+19	± 0.34%	8.2758E+19	± 0.25%	5.6425E+00
-470.00	6.4155E+18	± 0.70%	1.7727E+19	± 0.48%	1.0463E+19	± 0.62%	3.9973E+19	± 0.35%	7.4579E+19	± 0.27%	6.2307E+00
-518.50	4.7120E+18	± 0.84%	1.3640E+19	± 0.56%	8.7061E+18	± 0.68%	3.8448E+19	± 0.36%	6.5506E+19	± 0.29%	8.1596E+00
-568.50	2.7581E+18	± 1.07%	9.1791E+18	± 0.66%	6.8232E+18	± 0.75%	3.7515E+19	± 0.36%	5.6275E+19	± 0.30%	1.3602E+01
-620.00	1.3345E+18	± 1.65%	5.3548E+18	± 0.87%	4.7986E+18	± 0.91%	3.6101E+19	± 0.38%	4.7588E+19	± 0.33%	2.7053E+01
-670.00	6.2906E+17	± 2.30%	2.9103E+18	± 1.19%	3.1968E+18	± 1.10%	3.3607E+19	± 0.39%	4.0344E+19	± 0.36%	5.3425E+01
-720.00	3.1591E+17	± 3.41%	1.5826E+18	± 1.60%	2.0212E+18	± 1.40%	3.0127E+19	± 0.42%	3.4047E+19	± 0.40%	9.5362E+01
-770.00	1.6208E+17	± 4.20%	8.0490E+17	± 2.10%	1.2241E+18	± 1.79%	2.6317E+19	± 0.43%	2.8508E+19	± 0.42%	1.6237E+02
-820.00	9.8721E+16	± 4.03%	4.5244E+17	± 2.70%	7.1518E+17	± 2.27%	2.2748E+19	± 0.46%	2.4014E+19	± 0.51%	2.9695E+02
-864.50	6.6167E+16	± 4.05%	2.5735E+17	± 3.71%	4.2579E+17	± 3.15%	1.9649E+19	± 0.52%	2.0398E+19	± 0.50%	3.2655E+02
-914.50	5.1530E+16	± 4.73%	1.6273E+17	± 3.47%	2.4965E+17	± 3.50%	1.6827E+19	± 0.50%	1.7291E+19	± 0.49%	6.6378E+02
-995.00	1.9705E+16	± 3.93%	7.5567E+16	± 3.78%	1.0915E+17	± 3.70%	1.3080E+19	± 0.56%	1.3285E+19	± 0.56%	7.9789E+02
-1095.00	1.1994E+16	± 3.66%	3.8014E+16	± 3.78%	4.6436E+16	± 4.07%	9.5699E+18	± 0.62%	9.6663E+18	± 0.62%	6.3367E+02
-1202.00	1.0928E+16	± 4.61%	2.9148E+16	± 2.75%	2.6491E+16	± 3.07%	6.9250E+18	± 0.74%	6.9946E+18	± 0.73%	7.8394E+02
-1302.00	6.6251E+15	± 4.51%	2.3297E+16	± 2.65%	2.1119E+16	± 3.50%	5.1937E+18	± 0.80%	5.2447E+18	± 0.89%	5.3615E+02
-1395.00	5.3931E+15	± 4.51%	1.9000E+16	± 2.86%	1.7325E+16	± 2.87%	4.0046E+18	± 0.90%	4.0463E+18	± 0.79%	7.4235E+02
-1495.00	5.6887E+15	± 4.50%	1.8506E+16	± 2.86%	1.6767E+16	± 3.07%	3.0500E+18	± 1.01%	3.0909E+18	± 1.00%	4.5130E+02
-1589.50	5.1020E+15	± 5.12%	1.8506E+16	± 2.86%	1.6767E+16	± 3.07%	3.0500E+18	± 1.01%	3.0909E+18	± 1.00%	4.5130E+02
-1689.50	3.6497E+15	± 5.39%	1.5977E+16	± 2.99%	1.4661E+16	± 2.97%	1.7303E+18	± 1.09%	1.7646E+18	± 1.07%	4.7410E+02
-1820.00	3.5581E+15	± 5.05%	1.3437E+16	± 2.74%	1.2351E+16	± 2.80%	1.0740E+18	± 1.20%	1.1033E+18	± 1.17%	3.0185E+02
-1968.60	3.1437E+15	± 5.13%	1.0508E+16	± 3.24%	9.2809E+15	± 3.36%	4.9261E+17	± 1.57%	5.1555E+17	± 1.50%	1.5670E+02

Table D-21. Four-group Neutron Spectrum (m^2s^{-1}) in the Outer Core Pressure Boundary Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2088.45	6.1132E+14	± 7.64%	2.2232E+15	± 4.47%	2.0643E+15	± 4.47%	1.4762E+17	± 2.24%	1.5252E+17	± 2.18%	2.4148E+02
1820.00	6.1973E+14	± 10.07%	2.1047E+15	± 6.47%	2.4475E+15	± 6.23%	2.9503E+17	± 2.37%	3.0020E+17	± 2.33%	4.7606E+02
1689.50	7.5025E+14	± 11.71%	2.8315E+15	± 6.64%	2.7382E+15	± 6.56%	3.1768E+17	± 2.44%	3.2400E+17	± 2.40%	4.2343E+02
1589.50	9.3575E+14	± 11.00%	3.4665E+15	± 6.37%	3.2965E+15	± 6.31%	2.8455E+17	± 2.63%	2.9225E+17	± 2.57%	3.0409E+02
1495.00	1.1148E+15	± 10.30%	3.7993E+15	± 5.36%	4.1321E+15	± 5.66%	2.5256E+17	± 2.73%	2.6160E+17	± 2.64%	2.2655E+02
1395.00	1.2683E+15	± 9.59%	5.2500E+15	± 4.45%	5.5182E+15	± 4.61%	2.7612E+17	± 2.63%	2.8816E+17	± 2.53%	2.1772E+02
1302.00	2.0826E+15	± 7.69%	9.3067E+15	± 4.09%	7.9808E+15	± 4.26%	3.5276E+17	± 2.49%	3.7213E+17	± 2.37%	1.6939E+02
1202.00	4.0839E+15	± 8.16%	1.3815E+16	± 3.81%	1.3227E+16	± 6.15%	5.5413E+17	± 1.94%	5.8526E+17	± 1.85%	1.3569E+02
1095.00	5.3821E+15	± 9.16%	2.0884E+16	± 6.16%	2.2854E+16	± 5.43%	1.0522E+18	± 1.56%	1.1013E+18	± 1.50%	1.9550E+02
995.00	1.0731E+16	± 12.81%	4.2115E+16	± 5.30%	6.9226E+16	± 4.77%	2.1229E+18	± 1.13%	2.2449E+18	± 1.10%	1.9783E+02
914.50	2.2920E+16	± 9.67%	9.9563E+16	± 4.45%	1.7144E+17	± 4.19%	3.7854E+18	± 0.99%	4.0793E+18	± 0.95%	1.6515E+02
864.50	4.1678E+16	± 7.68%	1.9310E+17	± 3.89%	3.1370E+17	± 3.38%	5.5665E+18	± 0.91%	6.1149E+18	± 0.87%	1.3356E+02
820.00	6.9852E+16	± 5.89%	3.4583E+17	± 3.00%	5.0909E+17	± 2.54%	7.7720E+18	± 0.74%	8.6968E+18	± 0.70%	1.1126E+02
770.00	1.2404E+17	± 4.52%	6.6134E+17	± 2.22%	8.8928E+17	± 1.90%	1.0986E+19	± 0.64%	1.2660E+19	± 0.59%	8.8563E+01
720.00	2.5916E+17	± 3.47%	1.3201E+18	± 1.63%	1.5405E+18	± 1.47%	1.4302E+19	± 0.57%	1.7422E+19	± 0.52%	5.5187E+01
670.00	6.0640E+17	± 2.35%	2.6315E+18	± 1.16%	2.5407E+18	± 1.16%	1.6985E+19	± 0.52%	2.2763E+19	± 0.46%	2.8009E+01
620.00	1.5323E+18	± 1.46%	5.1767E+18	± 0.83%	3.8438E+18	± 0.93%	1.8349E+19	± 0.50%	2.8902E+19	± 0.40%	1.1975E+01
568.50	4.3535E+18	± 0.84%	9.4930E+18	± 0.60%	5.2792E+18	± 0.78%	1.6823E+19	± 0.48%	3.5949E+19	± 0.34%	3.8642E+00
518.50	1.0472E+19	± 0.55%	1.4746E+19	± 0.51%	6.3243E+18	± 0.74%	1.3656E+19	± 0.51%	4.5198E+19	± 0.31%	1.3041E+00
470.00	1.5144E+19	± 0.44%	1.9535E+19	± 0.43%	7.4390E+18	± 0.65%	1.3134E+19	± 0.50%	5.5252E+19	± 0.27%	8.6731E-01
420.00	1.8034E+19	± 0.41%	2.3719E+19	± 0.39%	8.7709E+18	± 0.60%	1.3854E+19	± 0.48%	6.4378E+19	± 0.25%	7.6825E-01
370.00	2.0653E+19	± 0.38%	2.7284E+19	± 0.36%	9.8061E+18	± 0.58%	1.4558E+19	± 0.47%	7.2301E+19	± 0.23%	7.0488E-01
320.00	2.2600E+19	± 0.37%	3.0088E+19	± 0.35%	1.0879E+19	± 0.55%	1.5342E+19	± 0.46%	7.8910E+19	± 0.22%	6.7886E-01
270.00	2.4209E+19	± 0.36%	3.2269E+19	± 0.33%	1.1548E+19	± 0.53%	1.5876E+19	± 0.45%	8.3902E+19	± 0.22%	6.5580E-01
220.00	2.5387E+19	± 0.35%	3.3798E+19	± 0.33%	1.2120E+19	± 0.52%	1.6462E+19	± 0.44%	8.7768E+19	± 0.21%	6.4843E-01
170.00	2.6368E+19	± 0.34%	3.4558E+19	± 0.32%	1.2518E+19	± 0.51%	1.7005E+19	± 0.43%	9.0450E+19	± 0.21%	6.4490E-01
125.00	2.6521E+19	± 0.36%	3.3818E+19	± 0.35%	1.2525E+19	± 0.55%	1.7696E+19	± 0.45%	9.0560E+19	± 0.22%	6.6724E-01
95.00	2.6310E+19	± 0.45%	3.3162E+19	± 0.43%	1.2541E+19	± 0.66%	1.8703E+19	± 0.54%	9.0715E+19	± 0.26%	7.1087E-01
75.00	2.5154E+19	± 0.46%	3.1816E+19	± 0.44%	1.2706E+19	± 0.66%	1.9505E+19	± 0.52%	8.9181E+19	± 0.27%	7.7544E-01
55.00	2.3403E+19	± 0.48%	3.0434E+19	± 0.45%	1.2808E+19	± 0.66%	2.1063E+19	± 0.51%	8.7708E+19	± 0.27%	9.0000E-01
35.00	2.0049E+19	± 0.52%	2.8371E+19	± 0.46%	1.3127E+19	± 0.65%	2.3601E+19	± 0.48%	8.5148E+19	± 0.27%	1.1772E+00
20.00	1.6444E+19	± 0.71%	2.7151E+19	± 0.56%	1.3327E+19	± 0.77%	2.6416E+19	± 0.54%	8.3337E+19	± 0.33%	1.6064E+00
7.50	1.3295E+19	± 0.71%	2.6108E+19	± 0.52%	1.3629E+19	± 0.69%	2.9640E+19	± 0.47%	8.2673E+19	± 0.30%	2.2294E+00
-7.50	1.0485E+19	± 0.78%	2.4385E+19	± 0.54%	1.3994E+19	± 0.69%	3.3524E+19	± 0.45%	8.2389E+19	± 0.30%	3.1972E+00
-20.00	8.9250E+18	± 0.93%	2.3569E+19	± 0.60%	1.4199E+19	± 0.76%	3.6325E+19	± 0.48%	8.3019E+19	± 0.33%	4.0700E+00
-35.00	7.7903E+18	± 0.84%	2.2537E+19	± 0.52%	1.4325E+19	± 0.63%	3.9182E+19	± 0.40%	8.3834E+19	± 0.29%	5.0296E+00
-55.00	6.7174E+18	± 0.89%	2.1387E+19	± 0.52%	1.4378E+19	± 0.63%	4.1840E+19	± 0.39%	8.4324E+19	± 0.29%	6.2287E+00
-75.00	6.3666E+18	± 0.91%	2.0845E+19	± 0.53%	1.4472E+19	± 0.63%	4.4411E+19	± 0.38%	8.6095E+19	± 0.28%	6.9756E+00
-95.00	6.3478E+18	± 0.92%	2.0652E+19	± 0.53%	1.4338E+19	± 0.62%	4.5960E+19	± 0.37%	8.7298E+19	± 0.28%	7.2403E+00
-125.00	6.2832E+18	± 0.72%	2.0745E+19	± 0.44%	1.4460E+19	± 0.52%	4.7581E+19	± 0.32%	8.9070E+19	± 0.24%	7.5728E+00
-170.00	6.6967E+18	± 0.64%	2.1289E+19	± 0.41%	1.4487E+19	± 0.48%	4.9719E+19	± 0.30%	9.2191E+19	± 0.22%	7.4244E+00
-220.00	7.0046E+18	± 0.63%	2.1859E+19	± 0.40%	1.4443E+19	± 0.49%	5.0089E+19	± 0.30%	9.3395E+19	± 0.22%	7.1508E+00

Table D-21. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-270.00	7.0939E+18 ± 0.62%	2.2104E+19 ± 0.40%	1.4084E+19 ± 0.49%	4.9546E+19 ± 0.30%	9.2828E+19 ± 0.22%	6.9844E+00
-320.00	6.9644E+18 ± 0.62%	2.1678E+19 ± 0.40%	1.3634E+19 ± 0.50%	4.8302E+19 ± 0.31%	9.0638E+19 ± 0.23%	6.9441E+00
-370.00	6.7029E+18 ± 0.64%	2.0617E+19 ± 0.41%	1.2813E+19 ± 0.52%	4.6308E+19 ± 0.31%	8.6440E+19 ± 0.23%	6.9086E+00
-420.00	6.1430E+18 ± 0.66%	1.8613E+19 ± 0.43%	1.1686E+19 ± 0.54%	4.3856E+19 ± 0.32%	8.0298E+19 ± 0.24%	7.1392E+00
-470.00	5.2252E+18 ± 0.73%	1.5750E+19 ± 0.47%	1.0063E+19 ± 0.58%	4.1534E+19 ± 0.32%	7.2572E+19 ± 0.25%	7.9488E+00
-518.50	3.8931E+18 ± 0.86%	1.2144E+19 ± 0.55%	8.2078E+18 ± 0.64%	3.9591E+19 ± 0.34%	6.3835E+19 ± 0.28%	1.0170E+01
-568.50	2.3364E+18 ± 1.08%	8.3259E+18 ± 0.63%	6.4306E+18 ± 0.70%	3.8164E+19 ± 0.34%	5.5257E+19 ± 0.28%	1.6334E+01
-620.00	1.1612E+18 ± 1.59%	4.9560E+18 ± 0.83%	4.5680E+18 ± 0.86%	3.6280E+19 ± 0.36%	4.6965E+19 ± 0.32%	3.1245E+01
-670.00	5.6610E+17 ± 2.23%	2.7552E+18 ± 1.12%	3.0540E+18 ± 1.03%	3.3562E+19 ± 0.37%	3.9938E+19 ± 0.35%	5.9287E+01
-720.00	2.8609E+17 ± 3.22%	1.4638E+18 ± 1.53%	1.9136E+18 ± 1.31%	3.0008E+19 ± 0.39%	3.3671E+19 ± 0.38%	1.0489E+02
-770.00	1.5867E+17 ± 4.77%	7.7071E+17 ± 2.04%	1.1559E+18 ± 1.67%	2.6347E+19 ± 0.41%	2.8432E+19 ± 0.40%	1.6604E+02
-820.00	8.8477E+16 ± 4.77%	4.1785E+17 ± 2.59%	6.8059E+17 ± 2.15%	2.2750E+19 ± 0.44%	2.3937E+19 ± 0.43%	2.5713E+02
-864.50	6.2183E+16 ± 5.34%	2.5035E+17 ± 3.38%	4.2396E+17 ± 2.93%	1.9663E+19 ± 0.47%	2.0399E+19 ± 0.48%	3.1621E+02
-914.50	4.4082E+16 ± 4.60%	1.5232E+17 ± 3.52%	2.4499E+17 ± 3.14%	1.6804E+19 ± 0.47%	1.7245E+19 ± 0.47%	3.8119E+02
-995.00	1.9479E+16 ± 5.94%	7.0228E+16 ± 3.31%	1.0986E+17 ± 4.78%	1.3057E+19 ± 0.48%	1.3256E+19 ± 0.47%	6.7031E+02
-1095.00	1.2426E+16 ± 5.94%	3.6114E+16 ± 3.31%	4.5712E+16 ± 4.78%	9.5564E+18 ± 0.54%	9.6506E+18 ± 0.54%	7.6908E+02
-1202.00	9.2571E+15 ± 3.47%	2.7869E+16 ± 2.96%	2.8507E+16 ± 4.09%	6.9774E+18 ± 0.60%	7.0430E+18 ± 0.59%	7.5373E+02
-1302.00	6.4689E+15 ± 4.36%	2.1461E+16 ± 2.65%	2.1157E+16 ± 3.14%	5.2050E+18 ± 0.71%	5.2541E+18 ± 0.70%	8.0462E+02
-1395.00	5.3589E+15 ± 4.38%	1.8028E+16 ± 2.63%	1.6616E+16 ± 2.70%	4.0233E+18 ± 0.77%	4.0633E+18 ± 0.76%	7.5077E+02
-1495.00	5.3015E+15 ± 4.29%	1.7050E+16 ± 2.69%	1.6468E+16 ± 2.82%	3.0439E+18 ± 0.85%	3.0827E+18 ± 0.84%	5.7416E+02
-1589.50	4.7510E+15 ± 4.80%	1.6705E+16 ± 2.87%	1.6091E+16 ± 2.94%	2.3432E+18 ± 0.96%	2.3808E+18 ± 0.95%	4.9321E+02
-1689.50	3.5975E+15 ± 5.15%	1.4851E+16 ± 2.81%	1.4230E+16 ± 2.82%	1.7402E+18 ± 1.05%	1.7728E+18 ± 1.03%	4.8371E+02
-1820.00	3.8718E+15 ± 4.77%	1.3326E+16 ± 2.63%	1.2307E+16 ± 2.69%	1.0879E+18 ± 1.17%	1.1175E+18 ± 1.14%	2.8099E+02
-1968.60	3.6280E+15 ± 4.67%	1.0127E+16 ± 3.02%	8.9712E+15 ± 3.26%	4.8862E+17 ± 1.51%	5.1135E+17 ± 1.45%	1.3468E+02

Table D-22. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Central Control Rod 1 Hafnium Absorber. Normalized to 350 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1295.00	4.1960E+16 ± 4.76%	6.2591E+16 ± 3.99%	9.2870E+15 ± 7.64%	2.9471E+16 ± 7.48%	1.4531E+17 ± 2.94%	7.0235E-01
1195.00	4.8813E+16 ± 4.33%	8.6761E+16 ± 3.73%	1.2210E+16 ± 6.90%	3.9445E+16 ± 8.51%	1.8823E+17 ± 2.94%	7.9185E-01
1095.00	4.6394E+16 ± 4.68%	9.0448E+16 ± 4.04%	1.6448E+16 ± 10.70%	7.5382E+16 ± 6.49%	2.2867E+17 ± 3.04%	1.6248E+00
995.00	6.4200E+16 ± 11.19%	1.1572E+17 ± 6.04%	9.5908E+16 ± 11.04%	1.8446E+17 ± 4.88%	3.6257E+17 ± 3.84%	2.3791E+00
895.00	7.6218E+16 ± 9.10%	2.0485E+17 ± 6.01%	9.5345E+16 ± 9.73%	3.0082E+17 ± 3.46%	6.7724E+17 ± 3.02%	3.9469E+00
820.00	1.1932E+17 ± 10.18%	4.8397E+17 ± 7.66%	2.0052E+17 ± 8.75%	4.9574E+17 ± 3.90%	1.2996E+18 ± 3.66%	4.1548E+00
770.00	1.8857E+17 ± 11.97%	6.9404E+17 ± 5.48%	3.0666E+17 ± 6.77%	6.6337E+17 ± 3.29%	1.8526E+18 ± 2.98%	3.5180E+00
720.00	2.9595E+17 ± 8.67%	1.2777E+18 ± 4.36%	5.8571E+17 ± 5.45%	8.6044E+17 ± 3.03%	3.0198E+18 ± 2.53%	2.9074E+00
670.00	6.1232E+17 ± 6.76%	2.6747E+18 ± 3.21%	1.0087E+18 ± 4.05%	1.0384E+18 ± 2.73%	5.3342E+18 ± 2.10%	1.6959E+00
620.00	1.0403E+18 ± 4.95%	4.6573E+18 ± 2.43%	1.5591E+18 ± 3.35%	1.0816E+18 ± 2.64%	8.3384E+18 ± 1.73%	1.0398E+00
570.00	1.9683E+18 ± 3.83%	7.7337E+18 ± 1.92%	2.2424E+18 ± 2.76%	1.0104E+18 ± 2.77%	1.2955E+19 ± 1.45%	5.1335E-01
520.00	3.4062E+18 ± 2.95%	1.1341E+19 ± 1.56%	2.8833E+18 ± 2.38%	9.5453E+17 ± 2.96%	1.8585E+19 ± 1.23%	2.8023E-01
470.00	4.6310E+18 ± 2.53%	1.5127E+19 ± 1.38%	3.8695E+18 ± 2.08%	9.5182E+17 ± 2.93%	2.4579E+19 ± 1.09%	2.0553E-01
420.00	5.4678E+18 ± 2.26%	1.8316E+19 ± 1.24%	4.4267E+18 ± 1.92%	9.7219E+17 ± 3.04%	2.9182E+19 ± 0.98%	1.7780E-01
370.00	6.2682E+18 ± 2.14%	2.1267E+19 ± 1.15%	5.1272E+18 ± 1.83%	1.0400E+18 ± 2.84%	3.3703E+19 ± 0.92%	1.6591E-01
320.00	6.8167E+18 ± 2.05%	2.3623E+19 ± 1.09%	5.5234E+18 ± 1.70%	1.1484E+18 ± 2.68%	3.7112E+19 ± 0.87%	1.6847E-01
270.00	7.3475E+18 ± 1.96%	2.5740E+19 ± 1.04%	6.1544E+18 ± 1.65%	1.1965E+18 ± 2.61%	4.0438E+19 ± 0.84%	1.6284E-01
220.00	7.8188E+18 ± 1.90%	2.7593E+19 ± 1.02%	6.5868E+18 ± 1.56%	1.5459E+18 ± 2.34%	4.3544E+19 ± 0.81%	1.9771E-01
170.00	8.3995E+18 ± 1.83%	2.8987E+19 ± 0.99%	8.0117E+18 ± 1.45%	2.8319E+18 ± 1.73%	4.8230E+19 ± 0.76%	3.3716E-01

Table D-23. Four-group Neutron Spectrum (m^2s^{-1}) in the Central Control Rod 1 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)			Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio					
2188.45	9.1493E+15	±	7.28%	1.1048E+16	±	7.35%	3.7207E+15	±	12.61%	8.0347E+16	±	7.53%	1.0426E+17	±	5.96%	8.7818E+00
1995.00	9.3218E+15	±	6.53%	1.2171E+16	±	6.51%	4.6680E+15	±	11.21%	1.5349E+17	±	5.49%	1.7965E+17	±	4.76%	1.6465E+01
1820.00	9.0236E+15	±	7.93%	1.1531E+16	±	7.53%	5.3951E+15	±	11.85%	2.1249E+17	±	6.12%	2.3844E+17	±	5.50%	2.3548E+01
1695.00	8.1599E+15	±	8.62%	1.4288E+16	±	8.54%	5.5570E+15	±	12.08%	2.3727E+17	±	5.92%	2.6528E+17	±	5.35%	2.9078E+01
1595.00	8.0939E+15	±	9.15%	1.4353E+16	±	8.33%	7.5394E+15	±	10.82%	2.2805E+17	±	6.10%	2.5804E+17	±	5.44%	2.8176E+01
1495.00	9.4896E+15	±	9.03%	1.7990E+16	±	7.28%	9.0298E+15	±	9.72%	2.1162E+17	±	6.10%	2.4813E+17	±	5.27%	2.2300E+01
1395.00	1.5134E+16	±	7.39%	3.3553E+16	±	5.31%	1.3948E+16	±	7.85%	1.9384E+17	±	6.79%	2.5647E+17	±	5.25%	1.2808E+01
1295.00	3.8149E+16	±	5.30%	6.5204E+16	±	4.50%	1.1132E+16	±	9.38%	3.4930E+16	±	13.85%	1.4941E+17	±	4.23%	9.1561E-01
1195.00	4.7312E+16	±	4.70%	8.7179E+16	±	3.95%	1.4492E+16	±	8.79%	3.1188E+16	±	16.56%	1.8017E+17	±	3.91%	6.5920E-01
1095.00	4.5889E+16	±	4.99%	9.8707E+16	±	5.55%	2.0038E+16	±	9.53%	5.0425E+16	±	13.95%	2.1506E+17	±	4.47%	1.0988E+00
995.00	5.2004E+16	±	6.25%	1.2048E+17	±	6.14%	4.3825E+16	±	13.25%	9.9689E+16	±	10.28%	3.1600E+17	±	4.63%	1.9169E+00
895.00	7.6093E+16	±	10.40%	2.3534E+17	±	7.18%	1.1009E+17	±	11.17%	2.2524E+17	±	7.18%	6.4676E+17	±	4.46%	2.9601E+00
820.00	1.1050E+17	±	12.58%	4.6235E+17	±	7.51%	2.2878E+17	±	10.91%	3.9140E+17	±	7.94%	1.1930E+18	±	4.66%	3.5420E+00
770.00	1.7851E+17	±	10.67%	7.7323E+17	±	6.18%	3.9689E+17	±	7.92%	5.4228E+17	±	7.09%	1.8909E+18	±	3.91%	3.0379E+00
720.00	3.3016E+17	±	9.42%	1.3190E+18	±	4.97%	7.0013E+17	±	6.28%	7.3193E+17	±	5.92%	3.0812E+18	±	3.22%	2.2169E+00
670.00	5.2993E+17	±	7.42%	2.7421E+18	±	3.55%	1.2046E+18	±	4.81%	8.3487E+17	±	5.51%	5.3115E+18	±	2.48%	1.5754E+00
620.00	1.0694E+18	±	5.41%	4.7532E+18	±	2.70%	1.8198E+18	±	3.91%	9.3647E+17	±	5.33%	8.5788E+18	±	2.00%	8.7571E-01
570.00	1.7898E+18	±	4.19%	7.7060E+18	±	2.11%	2.7252E+18	±	3.26%	8.9510E+17	±	5.10%	1.3116E+19	±	1.63%	5.0010E-01
520.00	3.2310E+18	±	3.20%	1.1549E+19	±	1.75%	3.4217E+18	±	2.86%	8.7852E+17	±	5.10%	1.9080E+19	±	1.39%	2.7190E-01
470.00	4.3969E+18	±	2.77%	1.5064E+19	±	1.52%	4.4555E+18	±	2.49%	9.1612E+17	±	5.26%	2.4833E+19	±	1.21%	2.0836E-01
420.00	5.4090E+18	±	2.55%	1.8627E+19	±	1.38%	5.1709E+18	±	2.34%	9.9799E+17	±	5.03%	3.0205E+19	±	1.12%	1.8451E-01
370.00	6.2516E+18	±	2.33%	2.1741E+19	±	1.29%	6.1354E+18	±	2.14%	1.0669E+18	±	5.00%	3.5195E+19	±	1.03%	1.7066E-01
320.00	6.5722E+18	±	2.31%	2.3976E+19	±	1.23%	6.6445E+18	±	2.03%	1.1730E+18	±	4.57%	3.8366E+19	±	0.99%	1.7847E-01
270.00	7.0562E+18	±	2.16%	2.5677E+19	±	1.17%	7.1316E+18	±	1.98%	1.2720E+18	±	4.45%	4.1136E+19	±	0.94%	1.8026E-01
220.00	7.6482E+18	±	2.09%	2.8000E+19	±	1.13%	8.1071E+18	±	1.87%	1.6592E+18	±	3.93%	4.5415E+19	±	0.90%	2.1694E-01
170.00	8.2280E+18	±	2.03%	2.9128E+19	±	1.11%	1.0785E+19	±	1.68%	4.6312E+18	±	2.50%	5.2772E+19	±	0.84%	5.6286E-01
125.00	8.6303E+18	±	1.80%	3.2033E+19	±	0.95%	1.7832E+19	±	1.22%	1.4012E+19	±	1.40%	7.2507E+19	±	0.66%	1.6236E+00
95.00	8.8823E+18	±	2.18%	3.3212E+19	±	1.12%	2.0120E+19	±	1.39%	1.7920E+19	±	1.50%	8.0135E+19	±	0.74%	2.0175E+00
75.00	9.1227E+18	±	2.13%	3.3957E+19	±	1.11%	2.1013E+19	±	1.37%	1.9048E+19	±	1.46%	8.3141E+19	±	0.73%	2.0880E+00
55.00	9.7526E+18	±	2.07%	3.5190E+19	±	1.10%	2.1568E+19	±	1.36%	2.0319E+19	±	1.43%	8.6830E+19	±	0.72%	2.0835E+00
35.00	1.0456E+19	±	2.01%	3.5964E+19	±	1.09%	2.2205E+19	±	1.33%	2.0353E+19	±	1.43%	8.8978E+19	±	0.72%	1.9465E+00
20.00	1.0883E+19	±	2.25%	3.6593E+19	±	1.24%	2.2857E+19	±	1.53%	2.0769E+19	±	1.64%	9.1102E+19	±	0.80%	1.9083E+00
7.50	1.1535E+19	±	2.00%	3.7580E+19	±	1.13%	2.2935E+19	±	1.41%	2.0209E+19	±	1.52%	9.2259E+19	±	0.75%	1.7519E+00
-7.50	1.2915E+19	±	1.91%	3.8680E+19	±	1.11%	2.2790E+19	±	1.41%	1.9671E+19	±	1.54%	9.4056E+19	±	0.74%	1.5232E+00
-20.00	1.4249E+19	±	1.98%	4.0352E+19	±	1.19%	2.3189E+19	±	1.54%	1.8858E+19	±	1.70%	9.6649E+19	±	0.80%	1.3235E+00
-35.00	1.5909E+19	±	1.65%	4.1022E+19	±	1.01%	2.2833E+19	±	1.30%	1.8521E+19	±	1.49%	9.8284E+19	±	0.68%	1.1641E+00
-55.00	1.7777E+19	±	1.53%	4.3955E+19	±	0.99%	2.2933E+19	±	1.31%	1.7675E+19	±	1.51%	1.0234E+20	±	0.67%	9.9423E-01
-75.00	2.0189E+19	±	1.45%	4.6186E+19	±	0.96%	2.2945E+19	±	1.30%	1.7237E+19	±	1.53%	1.0656E+20	±	0.66%	8.5381E-01
-95.00	2.1846E+19	±	1.41%	4.8187E+19	±	0.94%	2.3781E+19	±	1.28%	1.7235E+19	±	1.52%	1.1105E+20	±	0.64%	7.8890E-01
-125.00	2.3625E+19	±	1.10%	5.1921E+19	±	0.76%	2.3904E+19	±	1.06%	1.6535E+19	±	1.32%	1.1599E+20	±	0.54%	6.9990E-01
-170.00	2.6354E+19	±	0.97%	5.5378E+19	±	0.69%	2.3932E+19	±	1.00%	1.5624E+19	±	1.28%	1.2129E+20	±	0.49%	5.9287E-01
-220.00	2.8377E+19	±	0.94%	5.8664E+19	±	0.66%	2.4105E+19	±	0.99%	1.3981E+19	±	1.35%	1.2513E+20	±	0.48%	4.9268E-01

Table D-23. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-270.00	2.8558E+19	± 0.93%	5.9773E+19	± 0.66%	2.3092E+19	± 1.00%	1.3318E+19	± 1.38%	1.2474E+20	± 0.48%	4.6637E-01
-320.00	2.8197E+19	± 0.94%	5.8765E+19	± 0.67%	2.2617E+19	± 1.02%	1.2406E+19	± 1.42%	1.2198E+20	± 0.49%	4.3999E-01
-370.00	2.6283E+19	± 0.97%	5.5912E+19	± 0.68%	2.1181E+19	± 1.05%	1.1881E+19	± 1.46%	1.1526E+20	± 0.50%	4.5204E-01
-420.00	2.4609E+19	± 1.00%	5.0267E+19	± 0.72%	1.8837E+19	± 1.11%	1.1555E+19	± 1.46%	1.0527E+20	± 0.53%	4.6954E-01
-470.00	2.0989E+19	± 1.09%	4.3100E+19	± 0.78%	1.6970E+19	± 1.17%	1.2525E+19	± 1.39%	9.3584E+19	± 0.56%	5.9677E-01
-520.00	1.4995E+19	± 1.28%	3.3035E+19	± 0.89%	1.4610E+19	± 1.27%	1.5460E+19	± 1.25%	7.8100E+19	± 0.61%	1.0310E+00
-570.00	8.1142E+18	± 1.75%	2.2036E+19	± 1.08%	1.2447E+19	± 1.40%	2.2031E+19	± 1.07%	6.4628E+19	± 0.67%	2.7151E+00
-620.00	3.7067E+18	± 2.56%	1.3381E+19	± 1.39%	9.2619E+18	± 1.62%	2.7168E+19	± 0.97%	5.3518E+19	± 0.74%	7.3293E+00
-670.00	1.6510E+18	± 3.81%	7.3199E+18	± 1.85%	6.3822E+18	± 1.95%	2.8493E+19	± 0.95%	4.3846E+19	± 0.79%	1.7258E+01
-720.00	8.0133E+17	± 5.44%	3.8899E+18	± 2.54%	4.1869E+18	± 2.39%	2.7694E+19	± 0.95%	3.6572E+19	± 0.86%	3.4560E+01
-770.00	3.5574E+17	± 7.67%	2.0314E+18	± 3.41%	2.5895E+18	± 3.07%	2.4500E+19	± 1.01%	2.9477E+19	± 0.93%	6.8872E+01
-820.00	1.9618E+17	± 9.32%	1.0291E+18	± 4.58%	1.4349E+18	± 4.01%	2.1716E+19	± 1.04%	2.4376E+19	± 0.99%	1.1069E+02
-895.00	1.0753E+17	± 9.54%	4.5007E+17	± 4.94%	6.9439E+17	± 4.63%	1.6774E+19	± 0.96%	1.8026E+19	± 0.94%	1.5599E+02
-995.00	6.0231E+16	± 6.58%	1.6955E+17	± 5.58%	2.2309E+17	± 6.66%	1.1591E+19	± 1.10%	1.2044E+19	± 1.08%	1.9245E+02
-1095.00	5.1276E+16	± 4.46%	1.1048E+17	± 4.81%	1.0253E+17	± 8.12%	8.1876E+18	± 1.25%	8.4519E+18	± 1.22%	1.5967E+02
-1195.00	4.7994E+16	± 4.32%	9.2794E+16	± 3.48%	5.5924E+16	± 7.85%	5.9988E+18	± 1.43%	6.1955E+18	± 1.39%	1.2499E+02
-1295.00	4.5576E+16	± 4.25%	8.8505E+16	± 4.02%	4.3502E+16	± 4.62%	4.4048E+18	± 1.60%	4.5824E+18	± 1.54%	9.6649E+01
-1395.00	4.4079E+16	± 4.26%	7.8607E+16	± 3.57%	3.8657E+16	± 4.68%	3.2809E+18	± 1.84%	3.4422E+18	± 1.76%	7.4431E+01
-1495.00	4.4491E+16	± 4.43%	7.8892E+16	± 3.53%	3.4308E+16	± 5.21%	2.5090E+18	± 1.98%	2.6667E+18	± 1.87%	5.6393E+01
-1595.00	4.4008E+16	± 4.30%	7.4748E+16	± 3.66%	3.1340E+16	± 5.35%	1.9107E+18	± 2.22%	2.0608E+18	± 2.07%	4.3416E+01
-1695.00	4.3308E+16	± 4.36%	6.7161E+16	± 3.78%	3.2221E+16	± 5.27%	1.4017E+18	± 2.60%	1.5444E+18	± 2.38%	3.2365E+01
-1820.00	4.2412E+16	± 3.77%	6.8716E+16	± 3.29%	2.9904E+16	± 4.88%	8.6205E+17	± 2.68%	1.0031E+18	± 2.34%	2.0326E+01
-1968.60	3.9479E+16	± 3.95%	5.2420E+16	± 3.73%	1.9833E+16	± 5.93%	4.3588E+17	± 3.71%	5.4761E+17	± 3.01%	1.1041E+01

Table D-24. Four-group Neutron Spectrum (m^2s^{-1}) in the Central Control Rod 2 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
1295.00	4.2506E+16	± 4.52%	6.4444E+16	± 4.08%	9.3954E+15	± 7.51%	2.5277E+16	± 9.29%	1.4162E+17	± 3.07%	5.9467E-01
1195.00	4.9607E+16	± 4.40%	8.3866E+16	± 3.68%	1.1342E+16	± 7.45%	3.7369E+16	± 8.59%	1.8218E+17	± 2.90%	7.5329E-01
1095.00	4.5334E+16	± 4.62%	8.6567E+16	± 4.27%	1.3722E+16	± 9.46%	7.1197E+16	± 6.58%	2.1682E+17	± 3.06%	1.5705E+00
995.00	5.1418E+16	± 5.77%	1.1693E+17	± 7.20%	3.0066E+16	± 12.62%	1.3755E+17	± 4.80%	3.3597E+17	± 3.78%	2.6752E+00
895.00	6.1974E+16	± 5.90%	2.2289E+17	± 6.39%	7.5644E+16	± 9.71%	2.8624E+17	± 3.42%	6.4674E+17	± 3.05%	4.6187E+00
820.00	1.0328E+17	± 12.32%	4.1433E+17	± 6.60%	1.6139E+17	± 10.10%	5.0581E+17	± 3.81%	1.1848E+18	± 3.45%	4.8972E+00
770.00	1.6775E+17	± 9.41%	7.8980E+17	± 5.69%	3.2143E+17	± 6.76%	6.3172E+17	± 3.38%	1.9107E+18	± 3.07%	3.7659E+00
720.00	3.2688E+17	± 8.95%	1.3728E+18	± 4.34%	6.2077E+17	± 5.18%	8.3277E+17	± 2.95%	3.1532E+18	± 2.59%	2.5476E+00
670.00	5.1863E+17	± 6.43%	2.5844E+18	± 3.15%	9.4156E+17	± 4.18%	1.0035E+18	± 2.78%	5.0481E+18	± 2.07%	1.9349E+00
620.00	1.1002E+18	± 5.05%	4.5808E+18	± 2.43%	1.5797E+18	± 3.17%	1.0324E+18	± 2.76%	8.2931E+18	± 1.72%	9.3835E-01
570.00	1.8952E+18	± 3.71%	7.8488E+18	± 1.90%	2.1613E+18	± 2.77%	1.0100E+18	± 2.77%	1.2915E+19	± 1.44%	5.3291E-01
520.00	3.1372E+18	± 2.99%	1.1213E+19	± 1.58%	2.9356E+18	± 2.41%	9.1298E+17	± 2.95%	1.8198E+19	± 1.23%	2.9102E-01
470.00	4.4026E+18	± 2.50%	1.5088E+19	± 1.39%	3.6940E+18	± 2.13%	9.0942E+17	± 3.00%	2.4094E+19	± 1.10%	2.0657E-01
420.00	5.3392E+18	± 2.31%	1.8005E+19	± 1.24%	4.2116E+18	± 1.97%	9.1583E+17	± 3.04%	2.8471E+19	± 1.00%	1.7153E-01
370.00	6.1923E+18	± 2.13%	2.1222E+19	± 1.15%	4.9094E+18	± 1.81%	9.8048E+17	± 2.92%	3.3304E+19	± 0.92%	1.5834E-01
320.00	6.6964E+18	± 2.04%	2.3850E+19	± 1.10%	5.3915E+18	± 1.71%	1.1129E+18	± 2.74%	3.7051E+19	± 0.88%	1.6619E-01
270.00	7.4411E+18	± 1.97%	2.5112E+19	± 1.05%	5.9380E+18	± 1.67%	1.2942E+18	± 2.55%	3.9785E+19	± 0.84%	1.7393E-01
220.00	7.5242E+18	± 1.97%	2.6776E+19	± 1.03%	6.5055E+18	± 1.58%	1.5529E+18	± 2.34%	4.2359E+19	± 0.82%	2.0639E-01
170.00	8.2875E+18	± 1.86%	2.8832E+19	± 1.00%	7.6004E+18	± 1.47%	2.7019E+18	± 1.74%	4.7422E+19	± 0.77%	3.2602E-01

Table D-25. Four-group Neutron Spectrum (m^2s^{-1}) in the Central Control Rod 2 Al-6061 Support Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
2188.45	7.8329E+15	± 7.29%	1.0763E+16	± 7.73%	3.8092E+15	± 12.53%	7.3222E+16	± 8.07%	9.5627E+16	± 6.36%	9.3480E+00
1995.00	8.7110E+15	± 7.02%	1.2548E+16	± 6.92%	4.7685E+15	± 10.58%	1.7185E+17	± 5.54%	1.9788E+17	± 4.87%	1.9728E+01
1820.00	8.4353E+15	± 7.76%	1.4194E+16	± 7.60%	4.2026E+15	± 12.25%	2.3215E+17	± 5.90%	2.5898E+17	± 5.33%	2.7521E+01
1695.00	8.0625E+15	± 9.35%	1.5115E+16	± 8.32%	5.8545E+15	± 12.17%	2.6376E+17	± 6.35%	2.9280E+17	± 5.76%	3.2715E+01
1595.00	8.7357E+15	± 9.44%	1.6110E+16	± 7.78%	7.5413E+15	± 10.18%	2.3843E+17	± 6.54%	2.7082E+17	± 5.81%	2.7294E+01
1495.00	1.0449E+16	± 8.66%	1.9700E+16	± 7.10%	9.0155E+15	± 9.20%	2.2503E+17	± 6.32%	2.6419E+17	± 5.45%	2.1536E+01
1395.00	1.6078E+16	± 7.26%	3.4029E+16	± 5.24%	1.3660E+16	± 7.81%	2.0039E+17	± 7.42%	2.6416E+17	± 5.73%	1.2464E+01
1295.00	4.2232E+16	± 5.29%	6.7767E+16	± 4.40%	1.3418E+16	± 9.34%	2.6164E+16	± 15.82%	1.4958E+17	± 3.99%	6.1952E-01
1195.00	5.0307E+16	± 4.86%	8.8888E+16	± 4.28%	1.2980E+16	± 8.56%	2.8031E+16	± 20.79%	1.8021E+17	± 4.26%	5.5720E-01
1095.00	4.7966E+16	± 5.10%	9.2211E+16	± 4.80%	1.6671E+16	± 8.32%	4.5129E+16	± 15.66%	2.0198E+17	± 4.45%	9.4084E-01
995.00	5.4320E+16	± 8.43%	1.1252E+17	± 7.05%	3.4840E+16	± 16.68%	9.3040E+16	± 10.62%	2.9472E+17	± 5.09%	1.7128E+00
895.00	7.1451E+16	± 9.07%	2.2701E+17	± 6.80%	7.2859E+16	± 11.44%	2.1890E+17	± 7.65%	5.9022E+17	± 4.35%	3.0636E+00
820.00	1.0220E+17	± 13.51%	4.4701E+17	± 7.65%	1.7366E+17	± 11.03%	3.7184E+17	± 8.21%	1.0947E+18	± 4.84%	3.6385E+00
770.00	1.7615E+17	± 12.19%	8.7637E+17	± 6.11%	4.4375E+17	± 8.21%	5.0117E+17	± 7.03%	1.9974E+18	± 3.96%	2.8451E+00
720.00	3.0493E+17	± 9.36%	1.4710E+18	± 4.61%	7.7493E+17	± 6.19%	6.3147E+17	± 6.23%	3.1824E+18	± 3.14%	2.0708E+00
670.00	5.9362E+17	± 7.68%	2.5889E+18	± 3.59%	1.1474E+18	± 4.96%	8.3758E+17	± 5.76%	5.1675E+18	± 2.56%	1.4110E+00
620.00	1.1366E+18	± 5.55%	4.7595E+18	± 2.69%	1.9205E+18	± 3.84%	9.1360E+17	± 5.37%	8.7303E+18	± 2.01%	8.0377E-01
570.00	1.8338E+18	± 4.17%	7.8705E+18	± 2.11%	2.6028E+18	± 3.26%	8.8879E+17	± 5.56%	1.3196E+19	± 1.64%	4.8468E-01
520.00	3.1160E+18	± 3.22%	1.1136E+19	± 1.77%	3.5297E+18	± 2.84%	8.6018E+17	± 5.35%	1.8642E+19	± 1.39%	2.7606E-01
470.00	4.3710E+18	± 2.78%	1.4972E+19	± 1.53%	4.5913E+18	± 2.48%	8.9306E+17	± 5.27%	2.4827E+19	± 1.21%	2.0432E-01
420.00	5.2248E+18	± 2.51%	1.8350E+19	± 1.39%	4.9413E+18	± 2.37%	8.5643E+17	± 5.34%	2.9373E+19	± 1.12%	1.6391E-01
370.00	6.2693E+18	± 2.36%	2.1331E+19	± 1.30%	5.9281E+18	± 2.14%	9.8279E+17	± 5.19%	3.4511E+19	± 1.04%	1.5676E-01
320.00	6.4574E+18	± 2.29%	2.3510E+19	± 1.22%	6.6319E+18	± 2.08%	1.1509E+18	± 4.71%	3.7750E+19	± 0.99%	1.7822E-01
270.00	7.2305E+18	± 2.16%	2.5329E+19	± 1.18%	7.0954E+18	± 2.00%	1.3939E+18	± 4.40%	4.1049E+19	± 0.95%	1.9278E-01
220.00	7.4291E+18	± 2.15%	2.6819E+19	± 1.15%	8.0241E+18	± 1.88%	1.7943E+18	± 3.91%	4.4066E+19	± 0.91%	2.4153E-01
170.00	7.9003E+18	± 2.04%	2.8779E+19	± 1.11%	1.0286E+19	± 1.73%	4.4486E+18	± 2.50%	5.1414E+19	± 0.84%	5.6310E-01
125.00	8.6997E+18	± 1.82%	3.1799E+19	± 0.96%	1.7903E+19	± 1.21%	1.3837E+19	± 1.42%	7.2239E+19	± 0.66%	1.5905E+00
95.00	8.8359E+18	± 2.15%	3.2722E+19	± 1.13%	2.0819E+19	± 1.38%	1.7864E+19	± 1.51%	8.0241E+19	± 0.74%	2.0218E+00
75.00	9.2249E+18	± 2.13%	3.3487E+19	± 1.11%	2.1515E+19	± 1.35%	1.9560E+19	± 1.44%	8.3787E+19	± 0.73%	2.1204E+00
55.00	9.5034E+18	± 2.08%	3.4210E+19	± 1.10%	2.2226E+19	± 1.34%	2.0871E+19	± 1.43%	8.6811E+19	± 0.72%	2.1962E+00
35.00	1.0510E+19	± 1.99%	3.5064E+19	± 1.09%	2.2826E+19	± 1.31%	2.1189E+19	± 1.41%	8.9588E+19	± 0.72%	2.0161E+00
20.00	1.1189E+19	± 2.22%	3.6422E+19	± 1.26%	2.3478E+19	± 1.53%	2.0719E+19	± 1.63%	9.1808E+19	± 0.81%	1.8517E+00
7.50	1.1944E+19	± 1.99%	3.6965E+19	± 1.14%	2.3262E+19	± 1.39%	1.9939E+19	± 1.53%	9.2110E+19	± 0.75%	1.6693E+00
-7.50	1.2972E+19	± 1.94%	3.8788E+19	± 1.11%	2.3362E+19	± 1.39%	1.9904E+19	± 1.50%	9.5027E+19	± 0.74%	1.5344E+00
-20.00	1.4051E+19	± 2.02%	3.9818E+19	± 1.20%	2.3132E+19	± 1.52%	1.9728E+19	± 1.67%	9.6728E+19	± 0.79%	1.4041E+00
-35.00	1.5873E+19	± 1.63%	4.2010E+19	± 1.00%	2.3024E+19	± 1.30%	1.8613E+19	± 1.48%	9.9521E+19	± 0.68%	1.1727E+00
-55.00	1.8005E+19	± 1.52%	4.3397E+19	± 0.99%	2.2796E+19	± 1.31%	1.8291E+19	± 1.50%	1.0249E+20	± 0.67%	1.0159E+00
-75.00	2.0180E+19	± 1.46%	4.5429E+19	± 0.97%	2.3011E+19	± 1.30%	1.7524E+19	± 1.52%	1.0614E+20	± 0.66%	8.6836E-01
-95.00	2.1502E+19	± 1.41%	4.7922E+19	± 0.95%	2.3409E+19	± 1.30%	1.7166E+19	± 1.54%	1.1000E+20	± 0.65%	7.9835E-01
-125.00	2.3605E+19	± 1.11%	5.1069E+19	± 0.77%	2.3495E+19	± 1.07%	1.6393E+19	± 1.33%	1.1456E+20	± 0.54%	6.9446E-01
-170.00	2.5687E+19	± 0.98%	5.5971E+19	± 0.69%	2.3387E+19	± 1.01%	1.5565E+19	± 1.29%	1.2061E+20	± 0.49%	6.0595E-01
-220.00	2.7909E+19	± 0.94%	5.8921E+19	± 0.67%	2.3678E+19	± 1.00%	1.4226E+19	± 1.34%	1.2473E+20	± 0.48%	5.0970E-01

Table D-25. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-270.00	2.8552E+19	± 0.93%	5.9290E+19	± 0.66%	2.3414E+19	± 1.00%	1.3203E+19	± 1.38%	1.2446E+20	± 0.48%	4.6243E-01
-320.00	2.7903E+19	± 0.94%	5.8738E+19	± 0.66%	2.2649E+19	± 1.02%	1.2295E+19	± 1.43%	1.2158E+20	± 0.49%	4.4065E-01
-370.00	2.6253E+19	± 0.97%	5.5390E+19	± 0.69%	2.1026E+19	± 1.05%	1.1786E+19	± 1.47%	1.1445E+20	± 0.50%	4.4895E-01
-420.00	2.4405E+19	± 1.01%	5.0872E+19	± 0.72%	1.8875E+19	± 1.12%	1.1430E+19	± 1.47%	1.0558E+20	± 0.52%	4.6836E-01
-470.00	2.1231E+19	± 1.08%	4.2614E+19	± 0.78%	1.6801E+19	± 1.18%	1.2184E+19	± 1.41%	9.2830E+19	± 0.56%	5.7385E-01
-520.00	1.5125E+19	± 1.29%	3.2774E+19	± 0.89%	1.4289E+19	± 1.27%	1.5908E+19	± 1.25%	7.8095E+19	± 0.61%	1.0517E+00
-570.00	8.0350E+18	± 1.75%	2.2272E+19	± 1.08%	1.2228E+19	± 1.40%	2.2441E+19	± 1.06%	6.4976E+19	± 0.66%	2.7929E+00
-620.00	3.7149E+18	± 2.58%	1.3591E+19	± 1.37%	9.3001E+18	± 1.61%	2.7599E+19	± 0.97%	5.4205E+19	± 0.73%	7.4293E+00
-670.00	1.6429E+18	± 3.77%	7.4062E+18	± 1.84%	6.5221E+18	± 1.93%	2.8833E+19	± 0.94%	4.4405E+19	± 0.79%	1.7550E+01
-720.00	7.4868E+17	± 5.42%	3.9599E+18	± 2.52%	4.1397E+18	± 2.37%	2.7303E+19	± 0.96%	3.6151E+19	± 0.85%	3.6468E+01
-770.00	3.5742E+17	± 7.69%	1.9374E+18	± 3.42%	2.5948E+18	± 3.03%	2.4931E+19	± 0.99%	2.9820E+19	± 0.92%	6.9752E+01
-820.00	1.8764E+17	± 9.14%	1.0359E+18	± 4.54%	1.5023E+18	± 3.91%	2.1632E+19	± 1.05%	2.4358E+19	± 1.00%	1.1528E+02
-895.00	9.5808E+16	± 8.54%	4.2276E+17	± 5.22%	6.7455E+17	± 4.52%	1.6937E+19	± 0.96%	1.8130E+19	± 0.94%	1.7678E+02
-995.00	6.1797E+16	± 6.60%	1.8279E+17	± 6.03%	2.1110E+17	± 7.24%	1.1760E+19	± 1.10%	1.2215E+19	± 1.08%	1.9029E+02
-1095.00	4.9044E+16	± 4.66%	1.1429E+17	± 4.83%	9.5192E+16	± 10.19%	8.3932E+18	± 1.26%	8.6517E+18	± 1.23%	1.7114E+02
-1195.00	4.5269E+16	± 4.77%	9.3462E+16	± 3.88%	5.5070E+16	± 8.58%	5.9472E+18	± 1.42%	6.1410E+18	± 1.38%	1.3138E+02
-1295.00	4.8636E+16	± 4.15%	8.6392E+16	± 3.49%	4.2526E+16	± 7.75%	4.3494E+18	± 1.60%	4.5269E+18	± 1.55%	8.9427E+01
-1395.00	4.6618E+16	± 4.40%	7.9838E+16	± 3.51%	3.9712E+16	± 4.80%	3.3470E+18	± 1.84%	3.5131E+18	± 1.76%	7.1796E+01
-1495.00	4.6138E+16	± 4.31%	7.9155E+16	± 3.61%	3.6417E+16	± 5.07%	2.5327E+18	± 2.00%	2.6944E+18	± 1.89%	5.4894E+01
-1595.00	4.3416E+16	± 4.41%	7.6229E+16	± 3.59%	3.4261E+16	± 5.08%	1.8640E+18	± 2.28%	2.0179E+18	± 2.11%	4.2933E+01
-1695.00	4.2067E+16	± 4.42%	7.3137E+16	± 3.69%	3.4285E+16	± 5.20%	1.4249E+18	± 2.51%	1.5744E+18	± 2.29%	3.3873E+01
-1820.00	4.3299E+16	± 3.84%	7.1376E+16	± 3.26%	3.1979E+16	± 4.60%	9.4637E+17	± 2.72%	1.0930E+18	± 2.39%	2.1856E+01
-1968.60	3.5478E+16	± 4.09%	5.3616E+16	± 3.68%	2.1281E+16	± 5.78%	4.2197E+17	± 3.61%	5.3234E+17	± 2.93%	1.1894E+01

Table D-26. Four-group Neutron Spectrum (m^2s^{-1}) in the Central Control Rod 3 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
1295.00	4.4053E+16 ±	4.73%	6.1187E+16 ±	4.27%	8.7831E+15 ±	7.55%	2.2449E+16 ±	10.05%	1.3647E+17 ±	3.16%	5.0960E-01
1195.00	4.5898E+16 ±	4.64%	8.4862E+16 ±	3.56%	1.3589E+16 ±	14.07%	3.3123E+16 ±	8.30%	1.7747E+17 ±	2.97%	7.2165E-01
1095.00	5.0658E+16 ±	4.92%	8.9559E+16 ±	4.14%	1.6377E+16 ±	10.07%	6.6380E+16 ±	6.65%	2.2297E+17 ±	3.00%	1.3104E+00
995.00	5.1426E+16 ±	4.73%	1.1203E+17 ±	7.16%	3.2366E+16 ±	14.87%	1.3717E+17 ±	4.80%	3.3300E+17 ±	3.59%	2.6674E+00
895.00	7.7029E+16 ±	9.77%	2.0564E+17 ±	6.02%	8.3012E+16 ±	8.83%	2.9591E+17 ±	3.45%	6.6159E+17 ±	3.02%	3.8416E+00
820.00	1.0013E+17 ±	9.41%	3.7528E+17 ±	6.98%	2.0019E+17 ±	9.36%	4.8980E+17 ±	3.69%	1.1654E+18 ±	3.38%	4.8917E+00
770.00	1.7367E+17 ±	10.45%	7.9658E+17 ±	5.65%	3.6724E+17 ±	6.58%	7.0951E+17 ±	3.27%	2.0470E+18 ±	3.00%	4.0853E+00
720.00	2.9622E+17 ±	8.05%	1.4493E+18 ±	4.07%	5.8460E+17 ±	5.04%	8.5384E+17 ±	2.93%	3.1840E+18 ±	2.43%	2.8824E+00
670.00	5.5791E+17 ±	6.89%	2.7607E+18 ±	3.12%	9.6881E+17 ±	4.04%	1.0282E+18 ±	2.72%	5.3157E+18 ±	2.09%	1.8430E+00
620.00	1.0416E+18 ±	5.06%	4.6946E+18 ±	2.48%	1.5224E+18 ±	3.21%	1.1421E+18 ±	2.66%	8.4007E+18 ±	1.73%	1.0966E+00
570.00	2.0623E+18 ±	3.59%	7.7184E+18 ±	1.89%	2.3486E+18 ±	2.65%	1.0835E+18 ±	2.70%	1.3213E+19 ±	1.40%	5.2539E-01
520.00	3.4074E+18 ±	2.86%	1.1721E+19 ±	1.56%	3.0338E+18 ±	2.37%	9.9849E+17 ±	2.84%	1.9161E+19 ±	1.21%	2.9303E-01
470.00	4.8592E+18 ±	2.45%	1.5426E+19 ±	1.35%	3.6986E+18 ±	2.11%	9.1463E+17 ±	3.10%	2.4898E+19 ±	1.07%	1.8823E-01
420.00	5.7870E+18 ±	2.20%	1.9068E+19 ±	1.22%	4.4746E+18 ±	1.89%	9.7589E+17 ±	2.92%	3.0306E+19 ±	0.97%	1.6863E-01
370.00	6.4314E+18 ±	2.06%	2.2140E+19 ±	1.15%	5.1713E+18 ±	1.79%	1.0264E+18 ±	2.82%	3.4769E+19 ±	0.91%	1.5959E-01
320.00	7.1330E+18 ±	1.99%	2.4137E+19 ±	1.07%	5.7195E+18 ±	1.70%	1.0883E+18 ±	2.73%	3.8078E+19 ±	0.86%	1.5258E-01
270.00	7.6930E+18 ±	1.93%	2.6494E+19 ±	1.04%	6.3066E+18 ±	1.62%	1.2020E+18 ±	2.60%	4.1696E+19 ±	0.83%	1.5625E-01
220.00	7.9363E+18 ±	1.89%	2.8002E+19 ±	1.02%	6.6068E+18 ±	1.59%	1.5612E+18 ±	2.30%	4.4106E+19 ±	0.81%	1.9672E-01
170.00	8.4053E+18 ±	1.81%	2.9218E+19 ±	0.99%	8.0997E+18 ±	1.46%	2.7863E+18 ±	1.74%	4.8510E+19 ±	0.76%	3.3149E-01

Table D-27. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Central Control Rod 3 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)			Group 2 (100.0 - E+05 eV)			Group 3 (0.625 - 100.0 eV)			Group 4 (Below 0.625 eV)			Total		Thermal/Fast Ratio	
2188.45	7.2055E+15	±	7.65%	1.0176E+16	±	7.72%	3.5340E+15	±	12.85%	8.1079E+16	±	7.46%	1.0199E+17	±	6.07%	1.1252E+01
1995.00	9.1152E+15	±	7.03%	1.2442E+16	±	6.62%	4.7746E+15	±	10.80%	1.5961E+17	±	5.61%	1.8594E+17	±	4.88%	1.7510E+01
1820.00	8.8983E+15	±	7.74%	1.3677E+16	±	7.19%	4.3869E+15	±	11.47%	2.1938E+17	±	5.22%	2.4634E+17	±	4.70%	2.4654E+01
1695.00	8.8054E+15	±	9.05%	1.5113E+16	±	8.53%	6.2792E+15	±	12.16%	2.4370E+17	±	6.27%	2.7390E+17	±	5.63%	2.7676E+01
1595.00	9.4696E+15	±	9.10%	1.8392E+16	±	7.53%	7.9315E+15	±	10.28%	2.2006E+17	±	6.15%	2.5585E+17	±	5.36%	2.3239E+01
1495.00	9.6249E+15	±	9.06%	1.9854E+16	±	7.27%	9.8025E+15	±	9.71%	2.0131E+17	±	6.07%	2.4059E+17	±	5.17%	2.0916E+01
1395.00	1.5252E+16	±	6.98%	3.2941E+16	±	5.41%	1.3513E+16	±	7.93%	1.6816E+17	±	7.38%	2.2987E+17	±	5.53%	1.1026E+01
1295.00	4.2299E+16	±	5.10%	6.2170E+16	±	4.59%	1.2280E+16	±	8.89%	2.6447E+16	±	24.39%	1.4320E+17	±	5.33%	6.2523E-01
1195.00	4.4250E+16	±	5.21%	8.5436E+16	±	3.92%	1.4262E+16	±	10.46%	2.0445E+16	±	20.90%	1.6439E+17	±	3.92%	4.6203E-01
1095.00	4.8317E+16	±	7.00%	9.2552E+16	±	4.69%	2.0560E+16	±	13.53%	6.3618E+16	±	15.01%	2.2505E+17	±	5.11%	1.3167E+00
995.00	4.9329E+16	±	5.65%	1.1160E+17	±	6.09%	4.6101E+16	±	19.95%	1.0441E+17	±	11.16%	3.1144E+17	±	5.41%	2.1167E+00
895.00	6.8575E+16	±	7.61%	2.2438E+17	±	7.17%	7.9171E+16	±	10.90%	2.2603E+17	±	7.97%	5.9815E+17	±	4.48%	3.2960E+00
820.00	9.9845E+16	±	11.14%	4.1005E+17	±	7.94%	2.3483E+17	±	10.62%	3.8423E+17	±	8.17%	1.1290E+18	±	4.84%	3.8483E+00
770.00	2.0669E+17	±	11.44%	8.0592E+17	±	6.45%	4.6617E+17	±	7.82%	5.1319E+17	±	6.47%	1.9920E+18	±	3.96%	2.4829E+00
720.00	3.3725E+17	±	9.58%	1.5581E+18	±	4.50%	8.1931E+17	±	5.99%	7.1984E+17	±	5.89%	3.4345E+18	±	3.05%	2.1345E+00
670.00	5.6887E+17	±	7.34%	2.6753E+18	±	3.45%	1.1950E+18	±	4.84%	8.1001E+17	±	5.58%	5.2493E+18	±	2.49%	1.4239E+00
620.00	1.0458E+18	±	5.58%	4.7032E+18	±	2.74%	1.8689E+18	±	3.88%	1.0872E+18	±	5.18%	8.7051E+18	±	2.01%	1.0396E+00
570.00	2.0701E+18	±	3.99%	7.7515E+18	±	2.09%	2.7754E+18	±	3.20%	9.6843E+17	±	5.06%	1.3566E+19	±	1.62%	4.6782E-01
520.00	3.3925E+18	±	3.21%	1.2010E+19	±	1.73%	3.5842E+18	±	2.81%	9.3546E+17	±	5.15%	1.9922E+19	±	1.37%	2.7575E-01
470.00	4.5500E+18	±	2.69%	1.5630E+19	±	1.51%	4.3487E+18	±	2.53%	9.2034E+17	±	5.34%	2.5449E+19	±	1.20%	2.0227E-01
420.00	5.5781E+18	±	2.48%	1.9187E+19	±	1.36%	5.2904E+18	±	2.30%	9.4393E+17	±	5.02%	3.1000E+19	±	1.10%	1.6922E-01
370.00	6.3795E+18	±	2.31%	2.2091E+19	±	1.27%	6.0871E+18	±	2.13%	1.0034E+18	±	5.08%	3.5561E+19	±	1.02%	1.5728E-01
320.00	6.9098E+18	±	2.24%	2.4381E+19	±	1.21%	6.9181E+18	±	2.01%	1.1316E+18	±	4.47%	3.9341E+19	±	0.97%	1.6376E-01
270.00	7.5399E+18	±	2.19%	2.6277E+19	±	1.16%	7.4404E+18	±	1.93%	1.2557E+18	±	4.45%	4.2513E+19	±	0.93%	1.6654E-01
220.00	7.6018E+18	±	2.11%	2.7785E+19	±	1.13%	8.0357E+18	±	1.88%	1.7455E+18	±	3.76%	4.5168E+19	±	0.90%	2.2962E-01
170.00	8.2416E+18	±	2.03%	2.9275E+19	±	1.10%	1.0619E+19	±	1.68%	4.5800E+18	±	2.40%	5.2716E+19	±	0.83%	5.5572E-01
125.00	8.9003E+18	±	1.77%	3.2197E+19	±	0.95%	1.8122E+19	±	1.21%	1.4018E+19	±	1.40%	7.3238E+19	±	0.65%	1.5750E+00
95.00	9.1085E+18	±	2.14%	3.3305E+19	±	1.12%	2.1078E+19	±	1.36%	1.8184E+19	±	1.51%	8.1676E+19	±	0.74%	1.9964E+00
75.00	9.4182E+18	±	2.12%	3.4201E+19	±	1.11%	2.2425E+19	±	1.34%	1.9214E+19	±	1.46%	8.5257E+19	±	0.73%	2.0401E+00
55.00	9.8313E+18	±	2.05%	3.4981E+19	±	1.09%	2.2052E+19	±	1.33%	2.0304E+19	±	1.43%	8.7168E+19	±	0.71%	2.0652E+00
35.00	1.0641E+19	±	1.97%	3.5991E+19	±	1.07%	2.2524E+19	±	1.34%	2.0420E+19	±	1.43%	8.9578E+19	±	0.72%	1.9190E+00
20.00	1.1340E+19	±	2.25%	3.6830E+19	±	1.25%	2.2693E+19	±	1.55%	2.0124E+19	±	1.62%	9.0987E+19	±	0.81%	1.7746E+00
7.50	1.1783E+19	±	2.00%	3.7530E+19	±	1.13%	2.3385E+19	±	1.41%	2.0248E+19	±	1.53%	9.2945E+19	±	0.75%	1.7184E+00
-7.50	1.3152E+19	±	1.91%	3.9807E+19	±	1.11%	2.2822E+19	±	1.42%	1.9931E+19	±	1.53%	9.5712E+19	±	0.74%	1.5155E+00
-20.00	1.4133E+19	±	2.00%	4.0142E+19	±	1.19%	2.3064E+19	±	1.54%	1.8594E+19	±	1.67%	9.5933E+19	±	0.79%	1.3156E+00
-35.00	1.5758E+19	±	1.63%	4.1488E+19	±	1.01%	2.2681E+19	±	1.32%	1.8338E+19	±	1.47%	9.8265E+19	±	0.68%	1.1637E+00
-55.00	1.8299E+19	±	1.51%	4.3258E+19	±	0.99%	2.2603E+19	±	1.31%	1.7890E+19	±	1.49%	1.0205E+20	±	0.67%	9.7768E-01
-75.00	2.0053E+19	±	1.45%	4.5817E+19	±	0.97%	2.3129E+19	±	1.30%	1.7475E+19	±	1.50%	1.0647E+20	±	0.65%	8.7146E-01
-95.00	2.1498E+19	±	1.41%	4.7910E+19	±	0.94%	2.3773E+19	±	1.29%	1.7282E+19	±	1.52%	1.1046E+20	±	0.64%	8.0388E-01
-125.00	2.3702E+19	±	1.10%	5.1130E+19	±	0.76%	2.3726E+19	±	1.06%	1.6506E+19	±	1.31%	1.1506E+20	±	0.53%	6.9640E-01
-170.00	2.6087E+19	±	0.97%	5.5949E+19	±	0.68%	2.3406E+19	±	1.01%	1.5585E+19	±	1.27%	1.2103E+20	±	0.49%	5.9741E-01
-220.00	2.7788E+19	±	0.95%	5.8747E+19	±	0.67%	2.3267E+19	±	1.00%	1.4311E+19	±	1.33%	1.2411E+20	±	0.48%	5.1500E-01

Table D-27. (Continued)

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-270.00	2.8301E+19	± 0.93%	5.8759E+19	± 0.66%	2.2864E+19	± 1.01%	1.3620E+19	± 1.37%	1.2355E+20	± 0.48%	4.8124E-01
-320.00	2.8206E+19	± 0.93%	5.8593E+19	± 0.67%	2.2272E+19	± 1.03%	1.2342E+19	± 1.43%	1.2141E+20	± 0.49%	4.3759E-01
-370.00	2.6576E+19	± 0.97%	5.5498E+19	± 0.69%	2.0783E+19	± 1.06%	1.1881E+19	± 1.46%	1.1474E+20	± 0.50%	4.4706E-01
-420.00	2.4520E+19	± 1.01%	5.0984E+19	± 0.72%	1.8845E+19	± 1.13%	1.1418E+19	± 1.47%	1.0577E+20	± 0.53%	4.6565E-01
-470.00	2.1412E+19	± 1.07%	4.3234E+19	± 0.78%	1.6764E+19	± 1.18%	1.2139E+19	± 1.41%	9.3549E+19	± 0.56%	5.6694E-01
-520.00	1.5245E+19	± 1.26%	3.2620E+19	± 0.89%	1.4498E+19	± 1.27%	1.5644E+19	± 1.23%	7.8006E+19	± 0.61%	1.0262E+00
-570.00	8.1913E+18	± 1.74%	2.2115E+19	± 1.08%	1.2015E+19	± 1.41%	2.2399E+19	± 1.06%	6.4720E+19	± 0.66%	2.7345E+00
-620.00	3.6967E+18	± 2.53%	1.3425E+19	± 1.37%	9.3925E+18	± 1.60%	2.7519E+19	± 0.97%	5.4034E+19	± 0.73%	7.4443E+00
-670.00	1.7319E+18	± 3.69%	7.3636E+18	± 1.85%	6.5729E+18	± 1.93%	2.8510E+19	± 0.96%	4.4178E+19	± 0.79%	1.6462E+01
-720.00	7.7450E+17	± 5.37%	3.8529E+18	± 2.55%	4.4028E+18	± 2.35%	2.7122E+19	± 0.96%	3.6152E+19	± 0.86%	3.5018E+01
-770.00	3.5367E+17	± 7.34%	2.0526E+18	± 3.47%	2.6373E+18	± 3.02%	2.4806E+19	± 0.99%	2.9849E+19	± 0.92%	7.0137E+01
-820.00	1.8837E+17	± 9.72%	1.0182E+18	± 4.56%	1.4077E+18	± 4.01%	2.1410E+19	± 1.04%	2.4024E+19	± 0.99%	1.1366E+02
-895.00	8.5327E+16	± 8.21%	4.9023E+17	± 5.11%	6.5418E+17	± 4.61%	1.6767E+19	± 0.97%	1.7997E+19	± 0.94%	1.9650E+02
-995.00	5.6974E+16	± 7.84%	1.8351E+17	± 6.46%	2.1018E+17	± 6.98%	1.1806E+19	± 1.09%	1.2257E+19	± 1.08%	2.0723E+02
-1095.00	5.4620E+16	± 9.20%	1.1566E+17	± 5.80%	7.9407E+16	± 7.34%	8.5349E+18	± 1.24%	8.7846E+18	± 1.22%	1.5626E+02
-1195.00	4.7599E+16	± 4.09%	9.4866E+16	± 3.61%	5.3269E+16	± 7.44%	6.1107E+18	± 1.42%	6.3065E+18	± 1.38%	1.2838E+02
-1295.00	4.7689E+16	± 4.28%	8.5624E+16	± 3.50%	4.1942E+16	± 6.64%	4.4032E+18	± 1.58%	4.5784E+18	± 1.53%	9.2330E+01
-1395.00	4.3833E+16	± 4.37%	8.2649E+16	± 3.47%	4.1767E+16	± 4.91%	3.3083E+18	± 1.77%	3.4765E+18	± 1.69%	7.5474E+01
-1495.00	4.4940E+16	± 4.49%	7.4831E+16	± 3.61%	3.6447E+16	± 4.79%	2.5536E+18	± 1.99%	2.7098E+18	± 1.89%	5.6822E+01
-1595.00	4.3697E+16	± 4.38%	7.8459E+16	± 3.55%	3.5610E+16	± 5.35%	1.9215E+18	± 2.26%	2.0792E+18	± 2.10%	4.3973E+01
-1695.00	4.4251E+16	± 4.40%	7.8474E+16	± 3.64%	3.0119E+16	± 5.20%	1.4004E+18	± 2.58%	1.5532E+18	± 2.35%	3.1646E+01
-1820.00	4.4353E+16	± 3.78%	7.0430E+16	± 3.26%	2.8437E+16	± 4.86%	9.0930E+17	± 2.74%	1.0525E+18	± 2.39%	2.0501E+01
-1968.60	3.7534E+16	± 4.04%	5.6024E+16	± 3.72%	1.8494E+16	± 5.89%	4.3030E+17	± 3.75%	5.4235E+17	± 3.04%	1.1464E+01

Table D-28. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Irradiation Target 1 (Instrumented) Target. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
513.50	7.3834E+18	± 2.56%	1.6727E+19	± 1.74%	7.2276E+18	± 2.53%	5.5417E+18	± 2.87%	3.6880E+19	± 1.20%	7.5057E-01
470.00	1.0412E+19	± 1.97%	2.1164E+19	± 1.42%	8.2951E+18	± 2.14%	4.7380E+18	± 2.72%	4.4609E+19	± 0.99%	4.5506E-01
420.00	1.2681E+19	± 1.80%	2.5079E+19	± 1.29%	9.5291E+18	± 2.00%	4.4667E+18	± 2.80%	5.1756E+19	± 0.92%	3.5224E-01
370.00	1.4426E+19	± 1.69%	2.9550E+19	± 1.20%	1.0904E+19	± 1.86%	4.6895E+18	± 2.69%	5.9569E+19	± 0.86%	3.2507E-01
320.00	1.5480E+19	± 1.63%	3.1969E+19	± 1.15%	1.2092E+19	± 1.78%	5.0113E+18	± 2.60%	6.4552E+19	± 0.82%	3.2372E-01
270.00	1.6563E+19	± 1.57%	3.4973E+19	± 1.10%	1.2963E+19	± 1.70%	5.4135E+18	± 2.53%	6.9912E+19	± 0.79%	3.2685E-01
220.00	1.7749E+19	± 1.51%	3.6815E+19	± 1.08%	1.4187E+19	± 1.64%	6.0442E+18	± 2.39%	7.4796E+19	± 0.77%	3.4053E-01
170.00	1.8933E+19	± 1.47%	3.7682E+19	± 1.05%	1.5139E+19	± 1.60%	7.9045E+18	± 2.09%	7.9659E+19	± 0.75%	4.1750E-01
125.00	1.8798E+19	± 1.57%	3.9137E+19	± 1.12%	1.6572E+19	± 1.64%	1.0413E+19	± 1.98%	8.4920E+19	± 0.78%	5.5392E-01
95.00	1.8737E+19	± 1.92%	3.9087E+19	± 1.34%	1.7959E+19	± 1.92%	1.2314E+19	± 2.17%	8.8098E+19	± 0.90%	6.5721E-01
75.00	1.8663E+19	± 1.95%	3.9090E+19	± 1.35%	1.8285E+19	± 1.90%	1.2601E+19	± 2.14%	8.8639E+19	± 0.90%	6.7519E-01
55.00	1.7176E+19	± 2.01%	3.7951E+19	± 1.37%	1.9152E+19	± 1.85%	1.3178E+19	± 2.13%	8.7456E+19	± 0.90%	7.6721E-01
35.00	1.6342E+19	± 2.05%	3.8769E+19	± 1.35%	1.8725E+19	± 1.86%	1.4033E+19	± 2.09%	8.7869E+19	± 0.90%	8.5870E-01

Table D-29. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Irradiation Target 1 (Instrumented) Bracket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
513.50	6.7310E+18	± 3.45%	1.5988E+19	± 2.24%	7.3883E+18	± 3.24%	5.7204E+18	± 3.63%	3.5828E+19	± 1.52%	8.4986E-01
470.00	9.1476E+18	± 2.58%	2.0114E+19	± 1.77%	8.8495E+18	± 2.66%	4.8407E+18	± 3.46%	4.2952E+19	± 1.25%	5.2917E-01
420.00	1.0249E+19	± 2.37%	2.4828E+19	± 1.63%	9.8020E+18	± 2.52%	4.4588E+18	± 3.52%	4.9338E+19	± 1.16%	4.3504E-01
370.00	1.2132E+19	± 2.22%	2.8211E+19	± 1.50%	1.1066E+19	± 2.32%	4.9998E+18	± 3.32%	5.6409E+19	± 1.07%	4.1211E-01
320.00	1.2891E+19	± 2.09%	3.1926E+19	± 1.45%	1.2162E+19	± 2.23%	5.4063E+18	± 3.31%	6.2386E+19	± 1.04%	4.1939E-01
270.00	1.4716E+19	± 2.09%	3.3964E+19	± 1.40%	1.2991E+19	± 2.10%	5.5116E+18	± 3.15%	6.7183E+19	± 1.00%	3.7452E-01
220.00	1.5226E+19	± 1.98%	3.5643E+19	± 1.34%	1.4313E+19	± 2.11%	6.6151E+18	± 3.00%	7.1798E+19	± 0.96%	4.3446E-01
170.00	1.6234E+19	± 1.93%	3.6307E+19	± 1.33%	1.5817E+19	± 2.01%	8.8735E+18	± 2.61%	7.7232E+19	± 0.93%	5.4661E-01
125.00	1.6133E+19	± 2.08%	3.7819E+19	± 1.42%	1.7976E+19	± 2.09%	1.1669E+19	± 2.43%	8.3598E+19	± 0.97%	7.2328E-01
95.00	1.6078E+19	± 2.72%	3.7733E+19	± 1.82%	1.8969E+19	± 2.58%	1.3706E+19	± 2.86%	8.6485E+19	± 1.22%	8.5243E-01
75.00	1.5849E+19	± 2.77%	3.8454E+19	± 1.84%	1.9631E+19	± 2.49%	1.5289E+19	± 2.82%	8.9224E+19	± 1.21%	9.6468E-01
55.00	1.5142E+19	± 2.80%	3.6946E+19	± 1.86%	2.0777E+19	± 2.46%	1.5107E+19	± 2.78%	8.7972E+19	± 1.21%	9.9766E-01
35.00	1.4918E+19	± 2.91%	3.7294E+19	± 1.85%	1.9442E+19	± 2.49%	1.5042E+19	± 2.71%	8.6696E+19	± 1.21%	1.0083E+00

Table D-30. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Irradiation Target 2 (Uninstrumented) Target. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
513.50	6.7951E+18	± 5.14%	1.5946E+19	± 3.34%	8.3317E+18	± 4.38%	7.2599E+18	± 4.82%	3.8333E+19	± 2.17%	1.0684E+00
470.00	9.6916E+18	± 3.79%	2.1538E+19	± 2.54%	9.5915E+18	± 3.67%	6.2006E+18	± 4.59%	4.7022E+19	± 1.74%	6.3979E-01
420.00	1.1262E+19	± 3.52%	2.6538E+19	± 2.31%	1.1280E+19	± 3.45%	5.8848E+18	± 4.61%	5.4965E+19	± 1.63%	5.2253E-01
370.00	1.2948E+19	± 3.24%	3.0848E+19	± 2.13%	1.2806E+19	± 3.20%	6.3341E+18	± 4.42%	6.2937E+19	± 1.51%	4.8917E-01
320.00	1.4271E+19	± 3.13%	3.4574E+19	± 2.06%	1.3555E+19	± 3.07%	7.1636E+18	± 4.23%	6.9564E+19	± 1.45%	5.0197E-01
270.00	1.5721E+19	± 2.94%	3.7046E+19	± 1.98%	1.5004E+19	± 2.96%	7.6886E+18	± 3.98%	7.5459E+19	± 1.39%	4.8908E-01
220.00	1.6165E+19	± 2.90%	3.7725E+19	± 1.97%	1.5914E+19	± 2.91%	8.5486E+18	± 3.80%	7.8353E+19	± 1.37%	5.2884E-01
170.00	1.6906E+19	± 2.80%	3.8971E+19	± 1.91%	1.6906E+19	± 2.79%	1.0329E+19	± 3.46%	8.3111E+19	± 1.31%	6.1093E-01
125.00	1.7767E+19	± 3.01%	3.9781E+19	± 2.10%	1.7912E+19	± 2.99%	1.3080E+19	± 3.40%	8.8540E+19	± 1.39%	7.3619E-01
95.00	1.6774E+19	± 4.09%	3.8087E+19	± 2.70%	1.8540E+19	± 3.78%	1.5053E+19	± 4.00%	8.8453E+19	± 1.77%	8.9739E-01
75.00	1.6688E+19	± 4.09%	4.0587E+19	± 2.65%	1.9018E+19	± 3.71%	1.6293E+19	± 4.03%	9.2587E+19	± 1.75%	9.7629E-01
55.00	1.7136E+19	± 4.09%	3.9172E+19	± 2.71%	2.0826E+19	± 3.60%	1.5610E+19	± 4.01%	9.2744E+19	± 1.75%	9.1092E-01
35.00	1.5366E+19	± 4.29%	3.8989E+19	± 2.68%	2.0704E+19	± 3.57%	1.7115E+19	± 3.80%	9.2175E+19	± 1.74%	1.1138E+00

Table D-31. Four-group Neutron Spectrum (m^2s^{-1}) in the Upper Irradiation Target 2 (Uninstrumented) Bracket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
513.50	6.1309E+18	± 5.60%	1.5410E+19	± 3.50%	8.5818E+18	± 4.65%	6.7129E+18	± 5.09%	3.6835E+19	± 2.29%	1.0949E+00
470.00	8.8887E+18	± 4.05%	2.1581E+19	± 2.65%	9.5452E+18	± 3.91%	6.3159E+18	± 4.67%	4.6331E+19	± 1.84%	7.1055E-01
420.00	1.0277E+19	± 3.72%	2.4744E+19	± 2.46%	1.1375E+19	± 3.54%	6.1349E+18	± 5.02%	5.2531E+19	± 1.72%	5.9694E-01
370.00	1.1686E+19	± 3.46%	3.0212E+19	± 2.28%	1.3121E+19	± 3.37%	6.8488E+18	± 4.80%	6.1868E+19	± 1.61%	5.8609E-01
320.00	1.4007E+19	± 3.33%	3.3419E+19	± 2.17%	1.3794E+19	± 3.26%	7.2171E+18	± 4.49%	6.8437E+19	± 1.54%	5.1524E-01
270.00	1.4683E+19	± 3.15%	3.6355E+19	± 2.05%	1.5071E+19	± 3.21%	8.3000E+18	± 4.16%	7.4409E+19	± 1.47%	5.6530E-01
220.00	1.5534E+19	± 3.04%	3.7272E+19	± 2.04%	1.6569E+19	± 3.08%	8.8011E+18	± 4.04%	7.8176E+19	± 1.43%	5.6657E-01
170.00	1.5514E+19	± 2.97%	3.8916E+19	± 2.03%	1.7133E+19	± 2.94%	1.0542E+19	± 3.69%	8.2105E+19	± 1.38%	6.7955E-01
125.00	1.6386E+19	± 3.28%	3.9188E+19	± 2.17%	1.9314E+19	± 3.25%	1.3379E+19	± 3.57%	8.8267E+19	± 1.47%	8.1652E-01
95.00	1.5427E+19	± 4.60%	3.7209E+19	± 2.92%	2.0516E+19	± 3.97%	1.4980E+19	± 4.23%	8.8132E+19	± 1.91%	9.7103E-01
75.00	1.5811E+19	± 4.62%	3.8874E+19	± 2.91%	2.0590E+19	± 4.05%	1.6728E+19	± 4.26%	9.2002E+19	± 1.91%	1.0580E+00
55.00	1.5158E+19	± 4.47%	3.6682E+19	± 2.97%	2.0783E+19	± 3.88%	1.6810E+19	± 4.36%	8.9433E+19	± 1.91%	1.1090E+00
35.00	1.4601E+19	± 4.68%	3.9629E+19	± 2.87%	2.0644E+19	± 3.86%	1.6538E+19	± 4.24%	9.1412E+19	± 1.89%	1.1326E+00

Table D-32. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Transplutonium Production Rod 1 Actinide Oxide/Aluminum Target. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-67.50	1.5037E+19	± 4.66%	3.4921E+19	± 3.24%	1.7467E+19	± 4.39%	3.0712E+19	± 3.31%	9.8138E+19	± 1.90%	2.0424E+00
-95.00	1.7191E+19	± 5.59%	3.6209E+19	± 3.89%	1.6711E+19	± 5.29%	3.1088E+19	± 3.88%	1.0120E+20	± 2.27%	1.8084E+00
-125.00	1.8534E+19	± 3.89%	3.6049E+19	± 2.87%	1.6157E+19	± 4.31%	3.2406E+19	± 2.92%	1.0315E+20	± 1.70%	1.7485E+00
-170.00	1.9459E+19	± 3.54%	3.9525E+19	± 2.50%	1.7442E+19	± 3.55%	3.2664E+19	± 2.65%	1.0909E+20	± 1.50%	1.6787E+00
-220.00	2.2233E+19	± 3.32%	3.9258E+19	± 2.52%	1.8039E+19	± 3.65%	3.3867E+19	± 2.67%	1.1340E+20	± 1.49%	1.5233E+00
-270.00	2.1835E+19	± 3.42%	4.0060E+19	± 2.54%	1.6312E+19	± 3.78%	3.3093E+19	± 2.64%	1.1130E+20	± 1.51%	1.5156E+00
-320.00	2.0854E+19	± 3.30%	3.8179E+19	± 2.63%	1.5768E+19	± 3.88%	2.9817E+19	± 2.90%	1.0462E+20	± 1.57%	1.4298E+00
-370.00	2.0228E+19	± 3.40%	3.8045E+19	± 2.60%	1.5998E+19	± 3.87%	2.8843E+19	± 2.81%	1.0311E+20	± 1.56%	1.4259E+00
-420.00	2.0523E+19	± 3.46%	3.5785E+19	± 2.77%	1.2877E+19	± 4.19%	2.6200E+19	± 2.91%	9.5386E+19	± 1.65%	1.2766E+00
-470.00	1.6601E+19	± 3.64%	2.9044E+19	± 2.98%	1.1557E+19	± 4.57%	2.6540E+19	± 2.94%	8.3743E+19	± 1.72%	1.5987E+00
-520.00	1.2319E+19	± 4.44%	2.1668E+19	± 3.48%	9.3374E+18	± 5.13%	2.6409E+19	± 2.91%	6.9734E+19	± 1.89%	2.1437E+00
-570.00	5.8512E+18	± 6.83%	1.3214E+19	± 4.20%	8.9609E+18	± 5.68%	3.2486E+19	± 2.64%	6.0512E+19	± 2.02%	5.5521E+00
-620.00	2.1733E+18	± 11.05%	8.4149E+18	± 5.93%	6.2754E+18	± 6.16%	3.3960E+19	± 2.53%	5.0824E+19	± 2.17%	1.5626E+01
-670.00	7.2779E+17	± 17.81%	4.0708E+18	± 7.73%	3.6678E+18	± 7.49%	3.3073E+19	± 2.51%	4.1539E+19	± 2.28%	4.5443E+01
-720.00	3.5275E+17	± 19.36%	2.2155E+18	± 9.81%	2.4052E+18	± 9.88%	3.1926E+19	± 2.58%	3.6900E+19	± 2.41%	9.0508E+01
-770.00	1.9684E+17	± 26.30%	1.1566E+18	± 15.31%	1.8035E+18	± 11.46%	2.6814E+19	± 2.71%	2.9971E+19	± 2.60%	1.3622E+02
-820.00	8.8721E+16	± 27.39%	5.1644E+17	± 17.75%	8.6373E+17	± 15.67%	2.3779E+19	± 2.84%	2.5248E+19	± 2.77%	2.6802E+02
-892.00	7.1049E+16	± 16.27%	1.9742E+17	± 23.75%	3.5508E+17	± 19.67%	1.8131E+19	± 2.53%	1.8755E+19	± 2.50%	2.5519E+02

Table D-33. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Transplutonium Production Rod 1 Al-1100 Clad. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
-73.61	1.5729E+19	± 6.90%	3.2999E+19	± 5.05%	1.7847E+19	± 6.53%	2.8864E+19	± 4.70%	9.5439E+19	± 2.82%	1.8351E+00
-95.00	1.8624E+19	± 6.81%	3.6083E+19	± 4.79%	1.7848E+19	± 6.54%	3.2288E+19	± 5.05%	1.0484E+20	± 2.82%	1.7337E+00
-125.00	1.8609E+19	± 4.78%	3.5088E+19	± 3.59%	1.6891E+19	± 5.07%	3.2121E+19	± 3.62%	1.0271E+20	± 2.08%	1.7261E+00
-170.00	2.0506E+19	± 4.25%	3.8850E+19	± 3.07%	1.8044E+19	± 4.28%	3.1764E+19	± 3.26%	1.0916E+20	± 1.83%	1.5490E+00
-220.00	2.3004E+19	± 3.92%	3.9709E+19	± 3.04%	1.7528E+19	± 4.48%	3.3377E+19	± 3.20%	1.1362E+20	± 1.79%	1.4509E+00
-270.00	2.2686E+19	± 4.68%	4.1489E+19	± 3.29%	1.6356E+19	± 4.74%	3.3141E+19	± 3.32%	1.1367E+20	± 1.95%	1.4608E+00
-320.00	2.0964E+19	± 4.21%	3.8325E+19	± 3.44%	1.5206E+19	± 4.78%	2.8154E+19	± 3.58%	1.0265E+20	± 1.99%	1.3430E+00
-370.00	2.1069E+19	± 4.14%	3.8744E+19	± 3.78%	1.5219E+19	± 4.86%	2.8995E+19	± 3.39%	1.0403E+20	± 2.05%	1.3762E+00
-420.00	2.0229E+19	± 4.22%	3.5535E+19	± 3.61%	1.3413E+19	± 5.10%	2.6166E+19	± 3.51%	9.5343E+19	± 2.04%	1.2935E+00
-470.00	1.6919E+19	± 4.59%	2.9723E+19	± 3.74%	1.2393E+19	± 5.50%	2.6360E+19	± 3.55%	8.5395E+19	± 2.11%	1.5580E+00
-532.61	1.0286E+19	± 4.71%	1.9382E+19	± 3.74%	9.2217E+18	± 5.58%	2.7043E+19	± 2.81%	6.5933E+19	± 1.95%	2.6291E+00

Table D-34. Four-group Neutron Spectrum (m^2s^{-1}) in the Transplutonium Production Rod 1 Al-6061 Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
-73.61	1.5573E+19 ±	7.93%	3.2250E+19 ±	5.62%	1.8583E+19 ±	7.09%	2.7581E+19 ±	5.28%	9.3988E+19 ±	3.13%	1.7711E+00
-95.00	1.9273E+19 ±	7.39%	3.6116E+19 ±	5.44%	1.7434E+19 ±	7.59%	3.1258E+19 ±	5.36%	1.0408E+20 ±	3.14%	1.6219E+00
-125.00	2.0155E+19 ±	5.71%	3.5459E+19 ±	3.96%	1.6251E+19 ±	5.86%	3.0048E+19 ±	3.85%	1.0191E+20 ±	2.33%	1.4908E+00
-170.00	2.1336E+19 ±	4.72%	3.8110E+19 ±	3.63%	1.7956E+19 ±	4.83%	3.0635E+19 ±	3.56%	1.0804E+20 ±	2.06%	1.4358E+00
-220.00	2.4823E+19 ±	4.46%	3.9323E+19 ±	3.46%	1.7286E+19 ±	5.01%	3.1744E+19 ±	3.44%	1.1318E+20 ±	1.99%	1.2788E+00
-270.00	2.1576E+19 ±	4.68%	3.9625E+19 ±	3.45%	1.5714E+19 ±	5.51%	3.2175E+19 ±	3.62%	1.0909E+20 ±	2.08%	1.4913E+00
-320.00	2.1225E+19 ±	4.68%	3.7680E+19 ±	3.51%	1.4266E+19 ±	5.30%	2.7204E+19 ±	4.07%	1.0038E+20 ±	2.13%	1.2817E+00
-370.00	2.1332E+19 ±	4.73%	4.0113E+19 ±	3.41%	1.4241E+19 ±	5.27%	2.8485E+19 ±	3.67%	1.0417E+20 ±	2.07%	1.3353E+00
-420.00	2.0781E+19 ±	4.73%	3.4436E+19 ±	3.88%	1.3184E+19 ±	5.85%	2.5472E+19 ±	3.90%	9.3874E+19 ±	2.24%	1.2257E+00
-470.00	1.7426E+19 ±	5.04%	2.9150E+19 ±	3.90%	1.1781E+19 ±	6.24%	2.5370E+19 ±	3.82%	8.3728E+19 ±	2.27%	1.4559E+00
-532.61	1.0216E+19 ±	5.32%	1.9451E+19 ±	4.11%	8.2063E+18 ±	5.71%	2.6454E+19 ±	3.08%	6.4327E+19 ±	2.12%	2.5895E+00

Table D-35. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	2.7810E+16 ± 16.50%	1.1356E+17 ± 8.86%	8.4897E+16 ± 9.44%	1.1346E+18 ± 1.62%	1.3609E+18 ± 1.73%	4.0799E+01
950.00	5.8998E+15 ± 26.79%	2.8558E+16 ± 12.54%	2.0630E+16 ± 16.66%	4.2107E+17 ± 2.60%	4.7615E+17 ± 2.57%	7.1369E+01
1075.00	b	6.7202E+15 ± 11.79%	5.7272E+15 ± 19.44%	2.1520E+17 ± 2.94%	2.2912E+17 ± 2.86%	
1250.00	9.0208E+14 ± 24.08%	3.9834E+15 ± 11.50%	1.8936E+15 ± 16.83%	9.8080E+16 ± 3.45%	1.0486E+17 ± 3.29%	1.0873E+02
1450.00	3.2865E+14 ± 26.85%	2.2116E+15 ± 14.35%	8.7495E+14 ± 16.87%	5.9890E+16 ± 4.27%	6.3305E+16 ± 4.09%	1.8223E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-36. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	9.6728E+16 ± 13.64%	3.7487E+17 ± 6.71%	5.1097E+17 ± 5.75%	1.1222E+19 ± 1.48%	1.2205E+19 ± 1.41%	1.1602E+02
850.00	2.7195E+16 ± 17.94%	1.2704E+17 ± 11.11%	1.1168E+17 ± 10.40%	1.3218E+18 ± 2.69%	1.5877E+18 ± 2.56%	4.8604E+01
950.00	6.4144E+15 ± 28.32%	2.8385E+16 ± 14.20%	1.9436E+16 ± 17.69%	2.8959E+17 ± 5.81%	3.4382E+17 ± 5.20%	4.5146E+01
1075.00	b	6.6015E+15 ± 12.72%	6.1904E+15 ± 22.13%	1.3867E+17 ± 5.96%	1.5285E+17 ± 5.55%	
1250.00	9.2459E+14 ± 25.74%	4.2833E+15 ± 12.75%	1.4096E+15 ± 17.62%	6.2319E+16 ± 7.61%	6.8937E+16 ± 6.96%	6.7402E+01
1450.00	3.5542E+14 ± 25.87%	2.2382E+15 ± 14.51%	9.8477E+14 ± 19.31%	4.6242E+16 ± 7.63%	4.9820E+16 ± 7.13%	1.3011E+02
1650.00	6.0108E+14 ± 24.31%	2.3244E+15 ± 16.58%	2.2603E+15 ± 15.64%	4.1266E+17 ± 4.60%	4.1784E+17 ± 4.54%	6.8652E+02
1850.00	5.1549E+14 ± 26.41%	1.8823E+15 ± 14.97%	2.0785E+15 ± 13.79%	3.6670E+17 ± 4.68%	3.7117E+17 ± 4.63%	7.1136E+02
2115.95	5.0215E+14 ± 23.21%	1.9003E+15 ± 12.95%	1.8416E+15 ± 13.11%	1.6806E+17 ± 5.44%	1.7230E+17 ± 5.31%	3.3467E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-37. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	8.3872E+16 ± 12.34%	3.5641E+17 ± 6.08%	5.3957E+17 ± 5.23%	1.1313E+19 ± 1.37%	1.2293E+19 ± 1.31%	1.3488E+02
850.00	3.6460E+16 ± 16.47%	1.2348E+17 ± 7.52%	1.7009E+17 ± 7.50%	3.8206E+18 ± 1.55%	4.1507E+18 ± 1.50%	1.0479E+02
950.00	8.7553E+15 ± 29.64%	3.2562E+16 ± 11.35%	4.3721E+16 ± 12.87%	1.6951E+18 ± 2.20%	1.7801E+18 ± 2.14%	1.9360E+02
1075.00	b	6.9144E+15 ± 10.27%	1.0591E+16 ± 15.14%	8.7943E+17 ± 2.50%	8.9819E+17 ± 2.46%	
1250.00	6.5185E+14 ± 20.96%	4.0575E+15 ± 9.64%	3.5132E+15 ± 12.87%	4.0365E+17 ± 3.15%	4.1188E+17 ± 3.09%	6.1925E+02
1450.00	4.9851E+14 ± 19.70%	2.3410E+15 ± 11.96%	1.8064E+15 ± 12.74%	2.4788E+17 ± 4.01%	2.5252E+17 ± 3.94%	4.9723E+02
1650.00	5.6938E+14 ± 21.10%	2.2364E+15 ± 14.10%	2.0268E+15 ± 12.51%	4.3009E+17 ± 4.22%	4.3493E+17 ± 4.17%	7.5538E+02
1850.00	6.3807E+14 ± 20.29%	2.1219E+15 ± 14.42%	2.1663E+15 ± 12.34%	3.7553E+17 ± 4.39%	3.8046E+17 ± 4.34%	5.8855E+02
2115.95	4.6329E+14 ± 19.01%	1.9393E+15 ± 11.44%	1.7564E+15 ± 11.45%	1.7507E+17 ± 5.15%	1.7923E+17 ± 5.04%	3.7788E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-38. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	$2.4725\text{E}+16 \pm 21.0\%$	$1.1431\text{E}+17 \pm 8.4\%$	$7.8660\text{E}+16 \pm 8.81\%$	$1.1586\text{E}+18 \pm 1.60\%$	$1.3763\text{E}+18 \pm 1.69\%$	$4.6862\text{E}+01$
950.00	b	$3.2154\text{E}+16 \pm 12.15\%$	$3.0256\text{E}+16 \pm 18.94\%$	$4.4864\text{E}+17 \pm 2.51\%$	$5.1675\text{E}+17 \pm 2.71\%$	
1075.00	$1.3990\text{E}+15 \pm 26.45\%$	$1.1158\text{E}+16 \pm 19.77\%$	$6.4113\text{E}+15 \pm 18.12\%$	$2.1635\text{E}+17 \pm 2.90\%$	$2.3532\text{E}+17 \pm 2.98\%$	$1.5465\text{E}+02$
1250.00	$6.2961\text{E}+14 \pm 22.58\%$	$4.6381\text{E}+15 \pm 16.66\%$	$2.5815\text{E}+15 \pm 21.58\%$	$9.9277\text{E}+16 \pm 3.49\%$	$1.0713\text{E}+17 \pm 3.44\%$	$1.5768\text{E}+02$
1450.00	b	$1.9474\text{E}+15 \pm 15.03\%$	$9.0116\text{E}+14 \pm 15.08\%$	$6.4560\text{E}+16 \pm 4.28\%$	$6.7956\text{E}+16 \pm 4.11\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-39. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	$8.7577\text{E}+16 \pm 12.65\%$	$3.0687\text{E}+17 \pm 7.26\%$	$5.2693\text{E}+17 \pm 5.75\%$	$1.1529\text{E}+19 \pm 1.43\%$	$1.2450\text{E}+19 \pm 1.38\%$	$1.3164\text{E}+02$
850.00	$2.4057\text{E}+16 \pm 20.64\%$	$1.3402\text{E}+17 \pm 11.07\%$	$1.0384\text{E}+17 \pm 10.40\%$	$1.3484\text{E}+18 \pm 2.67\%$	$1.6103\text{E}+18 \pm 2.56\%$	$5.6049\text{E}+01$
950.00	$4.1805\text{E}+15 \pm 29.31\%$	$3.3483\text{E}+16 \pm 13.09\%$	$2.7404\text{E}+16 \pm 18.03\%$	$3.0700\text{E}+17 \pm 5.38\%$	$3.7207\text{E}+17 \pm 4.96\%$	$7.3437\text{E}+01$
1075.00	$1.4934\text{E}+15 \pm 26.66\%$	$1.1194\text{E}+16 \pm 21.11\%$	$5.1695\text{E}+15 \pm 18.53\%$	$1.3294\text{E}+17 \pm 6.13\%$	$1.5080\text{E}+17 \pm 5.85\%$	$8.9020\text{E}+01$
1250.00	$5.5927\text{E}+14 \pm 23.08\%$	$4.7470\text{E}+15 \pm 18.14\%$	$2.6222\text{E}+15 \pm 15.27\%$	$6.6208\text{E}+16 \pm 7.84\%$	$7.4137\text{E}+16 \pm 7.17\%$	$1.1838\text{E}+02$
1450.00	b	$1.7459\text{E}+15 \pm 17.01\%$	$1.0052\text{E}+15 \pm 17.65\%$	$5.2825\text{E}+16 \pm 7.62\%$	$5.6093\text{E}+16 \pm 7.21\%$	
1650.00	$4.4589\text{E}+14 \pm 26.08\%$	$1.9965\text{E}+15 \pm 14.02\%$	$1.9035\text{E}+15 \pm 14.59\%$	$3.9366\text{E}+17 \pm 4.50\%$	$3.9801\text{E}+17 \pm 4.45\%$	$8.8286\text{E}+02$
1850.00	$3.6772\text{E}+14 \pm 27.71\%$	$2.4153\text{E}+15 \pm 16.47\%$	$1.5559\text{E}+15 \pm 16.66\%$	$3.4001\text{E}+17 \pm 4.63\%$	$3.4435\text{E}+17 \pm 4.58\%$	$9.2464\text{E}+02$
2115.95	$4.5626\text{E}+14 \pm 21.96\%$	$2.0381\text{E}+15 \pm 12.52\%$	$1.4906\text{E}+15 \pm 13.12\%$	$1.5342\text{E}+17 \pm 5.37\%$	$1.5741\text{E}+17 \pm 5.24\%$	$3.3626\text{E}+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-40. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Al-6061 Sheath. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	7.1354E+16 ± 12.12%	3.1497E+17 ± 6.06%	5.2047E+17 ± 5.20%	1.1859E+19 ± 1.32%	1.2766E+19 ± 1.27%	1.6620E+02
850.00	2.4302E+16 ± 13.12%	1.3601E+17 ± 7.92%	1.5692E+17 ± 6.75%	4.0146E+18 ± 1.52%	4.3318E+18 ± 1.47%	1.6519E+02
950.00	3.9481E+15 ± 21.80%	3.0906E+16 ± 11.27%	4.1518E+16 ± 11.01%	1.7999E+18 ± 2.15%	1.8763E+18 ± 2.09%	4.5591E+02
1075.00	1.4216E+15 ± 21.73%	1.1533E+16 ± 17.16%	1.4258E+16 ± 16.42%	8.6039E+17 ± 2.50%	8.8760E+17 ± 2.46%	6.0521E+02
1250.00	9.2044E+14 ± 18.19%	5.6502E+15 ± 22.01%	4.5438E+15 ± 19.80%	3.8916E+17 ± 3.13%	4.0027E+17 ± 3.09%	4.2279E+02
1450.00	4.4045E+14 ± 24.10%	2.1013E+15 ± 13.62%	1.7405E+15 ± 13.15%	2.4163E+17 ± 3.73%	2.4591E+17 ± 3.67%	5.4859E+02
1650.00	5.1479E+14 ± 21.46%	2.3813E+15 ± 12.41%	1.9454E+15 ± 14.71%	4.0630E+17 ± 4.21%	4.1114E+17 ± 4.16%	7.8926E+02
1850.00	5.6673E+14 ± 24.94%	1.8086E+15 ± 14.00%	1.7967E+15 ± 14.71%	3.3803E+17 ± 4.32%	3.4220E+17 ± 4.27%	5.9646E+02
2115.95	5.2696E+14 ± 18.83%	2.0057E+15 ± 11.32%	1.5491E+15 ± 11.39%	1.5004E+17 ± 4.93%	1.5412E+17 ± 4.81%	2.8472E+02

Table D-41. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 3 Hafnium Absorber. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	3.1134E+16 ± 19.76%	1.3822E+17 ± 8.59%	8.4474E+16 ± 8.38%	1.1578E+18 ± 1.61%	1.4116E+18 ± 1.73%	3.7188E+01
950.00	b	2.9828E+16 ± 15.20%	2.2759E+16 ± 14.67%	4.2658E+17 ± 2.51%	4.8511E+17 ± 2.66%	
1075.00	b	8.4250E+15 ± 15.31%	5.2704E+15 ± 19.67%	2.0933E+17 ± 2.96%	2.2491E+17 ± 2.92%	
1250.00	9.7594E+14 ± 19.63%	3.8630E+15 ± 13.70%	1.9133E+15 ± 10.45%	9.6805E+16 ± 3.43%	1.0356E+17 ± 3.27%	9.9191E+01
1450.00	5.5992E+14 ± 23.21%	2.3655E+15 ± 13.37%	9.4155E+14 ± 17.10%	6.4035E+16 ± 4.08%	6.7882E+16 ± 3.90%	1.1860E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-42. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Safety Shutdown Rod 3 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	7.2566E+16 $\pm$ 13.35%	3.6443E+17 $\pm$ 6.45%	5.9793E+17 $\pm$ 5.66%	1.1100E+19 $\pm$ 1.46%	1.2135E+19 $\pm$ 1.40%	1.5297E+02
850.00	2.6900E+16 $\pm$ 16.46%	1.4083E+17 $\pm$ 9.43%	1.3266E+17 $\pm$ 13.28%	1.3684E+18 $\pm$ 2.70%	1.6688E+18 $\pm$ 2.62%	5.0869E+01
950.00	b	3.0939E+16 $\pm$ 16.70%	2.6634E+16 $\pm$ 19.60%	2.9207E+17 $\pm$ 5.26%	3.5493E+17 $\pm$ 4.95%	
1075.00	b	1.2188E+16 $\pm$ 22.70%	b	1.3120E+17 $\pm$ 5.98%	1.5254E+17 $\pm$ 5.82%	
1250.00	9.5503E+14 $\pm$ 19.17%	3.7005E+15 $\pm$ 15.95%	2.0828E+15 $\pm$ 13.29%	6.6117E+16 $\pm$ 7.57%	7.2855E+16 $\pm$ 6.94%	6.9231E+01
1450.00	6.8552E+14 $\pm$ 27.27%	2.6386E+15 $\pm$ 15.80%	8.8945E+14 $\pm$ 20.18%	4.7950E+16 $\pm$ 8.16%	5.2163E+16 $\pm$ 7.57%	6.9947E+01
1650.00	b	2.4033E+15 $\pm$ 14.06%	1.8025E+15 $\pm$ 14.15%	4.1017E+17 $\pm$ 4.15%	4.1469E+17 $\pm$ 4.11%	
1850.00	7.2877E+14 $\pm$ 25.36%	2.0417E+15 $\pm$ 16.55%	1.7850E+15 $\pm$ 14.66%	3.5440E+17 $\pm$ 4.80%	3.5895E+17 $\pm$ 4.74%	4.8629E+02
2115.95	4.5475E+14 $\pm$ 23.74%	1.9023E+15 $\pm$ 12.75%	1.6041E+15 $\pm$ 13.41%	1.6144E+17 $\pm$ 5.11%	1.6540E+17 $\pm$ 4.99%	3.5501E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-43. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Safety Shutdown Rod 3 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	6.8770E+16 $\pm$ 10.92%	3.9744E+17 $\pm$ 5.83%	5.7563E+17 $\pm$ 4.97%	1.1658E+19 $\pm$ 1.35%	1.2700E+19 $\pm$ 1.29%	1.6952E+02
850.00	2.9014E+16 $\pm$ 14.48%	1.2388E+17 $\pm$ 7.85%	1.8087E+17 $\pm$ 6.85%	3.8699E+18 $\pm$ 1.55%	4.2037E+18 $\pm$ 1.49%	1.3338E+02
950.00	b	3.4449E+16 $\pm$ 13.93%	4.2892E+16 $\pm$ 13.14%	1.7374E+18 $\pm$ 2.21%	1.8191E+18 $\pm$ 2.16%	
1075.00	b	8.7952E+15 $\pm$ 11.83%	9.7840E+15 $\pm$ 16.32%	8.3567E+17 $\pm$ 2.52%	8.5570E+17 $\pm$ 2.47%	
1250.00	9.0473E+14 $\pm$ 18.30%	4.6826E+15 $\pm$ 10.99%	4.7719E+15 $\pm$ 10.83%	3.9265E+17 $\pm$ 3.17%	4.0301E+17 $\pm$ 3.10%	4.3400E+02
1450.00	6.5672E+14 $\pm$ 22.07%	2.2609E+15 $\pm$ 12.28%	1.8097E+15 $\pm$ 13.81%	2.4997E+17 $\pm$ 3.96%	2.5469E+17 $\pm$ 3.89%	3.8063E+02
1650.00	4.7810E+14 $\pm$ 24.23%	2.0642E+15 $\pm$ 13.36%	1.9938E+15 $\pm$ 12.32%	4.3731E+17 $\pm$ 4.02%	4.4184E+17 $\pm$ 3.98%	9.1468E+02
1850.00	6.5277E+14 $\pm$ 20.09%	1.9774E+15 $\pm$ 14.32%	1.8665E+15 $\pm$ 15.25%	3.5642E+17 $\pm$ 4.66%	3.6092E+17 $\pm$ 4.60%	5.4602E+02
2115.95	6.4120E+14 $\pm$ 18.40%	1.7910E+15 $\pm$ 11.72%	1.6284E+15 $\pm$ 11.31%	1.6577E+17 $\pm$ 4.69%	1.6983E+17 $\pm$ 4.58%	2.5852E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-44. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	2.0395E+16 ± 17.08%	9.7958E+16 ± 9.06%	8.2307E+16 ± 9.24%	1.1102E+18 ± 1.62%	1.3109E+18 ± 1.69%	5.4436E+01
950.00	8.2507E+15 ± 23.85%	2.9966E+16 ± 13.10%	2.0955E+16 ± 15.00%	4.3444E+17 ± 2.55%	4.9360E+17 ± 2.54%	5.2655E+01
1075.00	2.2085E+15 ± 27.59%	8.9956E+15 ± 14.83%	5.2387E+15 ± 16.11%	2.1326E+17 ± 2.93%	2.2970E+17 ± 2.83%	9.6560E+01
1250.00	1.2006E+15 ± 22.69%	5.8872E+15 ± 20.28%	2.1351E+15 ± 18.37%	9.4420E+16 ± 3.49%	1.0364E+17 ± 3.56%	7.8647E+01
1450.00	7.4629E+14 ± 23.97%	2.8556E+15 ± 11.96%	1.2153E+15 ± 13.65%	6.1870E+16 ± 4.13%	6.6688E+16 ± 3.90%	8.2904E+01

Table D-45. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	7.5893E+16 ± 15.15%	3.0049E+17 ± 6.94%	4.9474E+17 ± 5.92%	1.1302E+19 ± 1.48%	1.2173E+19 ± 1.42%	1.4892E+02
850.00	2.2715E+16 ± 21.50%	1.0874E+17 ± 9.65%	1.3027E+17 ± 12.15%	1.2767E+18 ± 2.78%	1.5385E+18 ± 2.66%	5.6207E+01
950.00	b	3.4461E+16 ± 16.24%	1.8805E+16 ± 18.32%	2.8217E+17 ± 4.99%	3.4740E+17 ± 4.71%	
1075.00	b	9.1798E+15 ± 15.37%	7.0917E+15 ± 20.20%	1.3809E+17 ± 6.36%	1.5678E+17 ± 5.84%	
1250.00	9.7532E+14 ± 23.93%	5.5907E+15 ± 22.39%	b	5.8790E+16 ± 6.97%	6.8351E+16 ± 6.61%	6.0277E+01
1450.00	5.8683E+14 ± 23.65%	3.0752E+15 ± 13.55%	1.4780E+15 ± 16.51%	4.7881E+16 ± 8.20%	5.3021E+16 ± 7.48%	8.1592E+01
1650.00	7.2497E+14 ± 23.23%	2.6403E+15 ± 12.61%	2.1028E+15 ± 13.58%	3.7551E+17 ± 4.29%	3.8098E+17 ± 4.24%	5.1797E+02
1850.00	b	1.8119E+15 ± 15.76%	2.2654E+15 ± 14.99%	3.4500E+17 ± 4.64%	3.4947E+17 ± 4.58%	
2115.95	5.3712E+14 ± 21.07%	2.1421E+15 ± 12.13%	1.5965E+15 ± 14.18%	1.7187E+17 ± 4.75%	1.7615E+17 ± 4.65%	3.1999E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-46. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	6.2459E+16 ± 12.82%	3.2652E+17 ± 6.04%	4.9304E+17 ± 5.36%	1.1675E+19 ± 1.35%	1.2557E+19 ± 1.30%	1.8692E+02
850.00	2.1714E+16 ± 14.60%	1.0973E+17 ± 7.92%	1.3952E+17 ± 7.62%	3.8127E+18 ± 1.55%	4.0836E+18 ± 1.50%	1.7559E+02
950.00	7.8016E+15 ± 24.98%	3.3605E+16 ± 11.87%	4.2678E+16 ± 10.39%	1.6559E+18 ± 2.16%	1.7400E+18 ± 2.10%	2.1225E+02
1075.00	1.3504E+15 ± 22.18%	1.1250E+16 ± 17.05%	1.2319E+16 ± 13.89%	8.7729E+17 ± 2.59%	9.0221E+17 ± 2.54%	6.4967E+02
1250.00	1.1926E+15 ± 16.97%	5.5458E+15 ± 19.35%	3.2087E+15 ± 11.85%	3.8928E+17 ± 3.06%	3.9922E+17 ± 3.01%	3.2640E+02
1450.00	7.5091E+14 ± 19.36%	2.9544E+15 ± 10.28%	2.3333E+15 ± 11.22%	2.3378E+17 ± 3.81%	2.3982E+17 ± 3.72%	3.1133E+02
1650.00	6.7757E+14 ± 20.61%	2.4547E+15 ± 11.78%	2.3710E+15 ± 12.51%	4.0283E+17 ± 3.94%	4.0833E+17 ± 3.89%	5.9452E+02
1850.00	4.7506E+14 ± 26.15%	2.2685E+15 ± 15.12%	1.9811E+15 ± 13.32%	3.4887E+17 ± 4.31%	3.5359E+17 ± 4.26%	7.3436E+02
2115.95	6.0742E+14 ± 17.13%	2.1404E+15 ± 11.27%	1.6959E+15 ± 11.49%	1.7081E+17 ± 4.59%	1.7525E+17 ± 4.48%	2.8120E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-47. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	2.2699E+16 ± 16.89%	1.2814E+17 ± 8.68%	7.5137E+16 ± 8.10%	1.1478E+18 ± 1.61%	1.3738E+18 ± 1.69%	5.0567E+01
950.00	b	3.1842E+16 ± 14.17%	1.9667E+16 ± 15.25%	3.9920E+17 ± 2.60%	4.6210E+17 ± 2.80%	
1075.00	8.6368E+14 ± 22.04%	9.0488E+15 ± 20.68%	6.1884E+15 ± 20.81%	2.0669E+17 ± 2.94%	2.2279E+17 ± 2.96%	2.3932E+02
1250.00	7.3447E+14 ± 24.43%	3.7629E+15 ± 11.38%	1.6664E+15 ± 11.40%	9.4487E+16 ± 3.58%	1.0065E+17 ± 3.40%	1.2865E+02
1450.00	7.3019E+14 ± 28.81%	2.0049E+15 ± 14.02%	1.3414E+15 ± 15.16%	6.2702E+16 ± 4.16%	6.6778E+16 ± 3.97%	8.5870E+01

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-48. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	6.1653E+16 $\pm$ 15.42%	3.3159E+17 $\pm$ 6.75%	5.1876E+17 $\pm$ 5.83%	1.1117E+19 $\pm$ 1.46%	1.2029E+19 $\pm$ 1.41%	1.8032E+02
850.00	2.6593E+16 $\pm$ 19.38%	1.3055E+17 $\pm$ 9.21%	1.0623E+17 $\pm$ 10.54%	1.3034E+18 $\pm$ 2.71%	1.5667E+18 $\pm$ 2.53%	4.9010E+01
950.00	b	2.7893E+16 $\pm$ 14.31%	2.8662E+16 $\pm$ 21.02%	2.8081E+17 $\pm$ 5.41%	3.4884E+17 $\pm$ 5.13%	
1075.00	7.8552E+14 $\pm$ 24.49%	6.8577E+15 $\pm$ 12.59%	5.2889E+15 $\pm$ 20.01%	1.2859E+17 $\pm$ 6.29%	1.4152E+17 $\pm$ 5.81%	1.6370E+02
1250.00	5.3042E+14 $\pm$ 22.61%	3.6596E+15 $\pm$ 11.47%	1.8276E+15 $\pm$ 13.17%	5.7237E+16 $\pm$ 7.93%	6.3254E+16 $\pm$ 7.22%	1.0791E+02
1450.00	b	1.8825E+15 $\pm$ 15.79%	1.4420E+15 $\pm$ 16.86%	4.5275E+16 $\pm$ 7.95%	4.9098E+16 $\pm$ 7.40%	
1650.00	4.5757E+14 $\pm$ 27.77%	2.3211E+15 $\pm$ 14.49%	2.3996E+15 $\pm$ 14.34%	4.0358E+17 $\pm$ 4.38%	4.0876E+17 $\pm$ 4.33%	8.8202E+02
1850.00	4.6958E+14 $\pm$ 28.14%	1.7629E+15 $\pm$ 16.19%	1.5905E+15 $\pm$ 14.72%	3.4397E+17 $\pm$ 4.56%	3.4780E+17 $\pm$ 4.52%	7.3251E+02
2115.95	5.6540E+14 $\pm$ 20.92%	1.8079E+15 $\pm$ 13.67%	1.2272E+15 $\pm$ 14.74%	1.5516E+17 $\pm$ 5.47%	1.5876E+17 $\pm$ 5.36%	2.7443E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-49. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	5.4099E+16 $\pm$ 12.39%	3.1868E+17 $\pm$ 6.39%	4.8383E+17 $\pm$ 5.19%	1.1481E+19 $\pm$ 1.36%	1.2338E+19 $\pm$ 1.31%	2.1223E+02
850.00	2.2600E+16 $\pm$ 14.66%	1.2939E+17 $\pm$ 8.12%	1.4544E+17 $\pm$ 7.15%	3.8632E+18 $\pm$ 1.56%	4.1607E+18 $\pm$ 1.51%	1.7094E+02
950.00	9.6135E+15 $\pm$ 28.32%	3.3629E+16 $\pm$ 13.54%	3.7107E+16 $\pm$ 12.62%	1.6478E+18 $\pm$ 2.27%	1.7282E+18 $\pm$ 2.21%	1.7141E+02
1075.00	1.0122E+15 $\pm$ 18.93%	1.1295E+16 $\pm$ 27.71%	8.6676E+15 $\pm$ 13.42%	8.7916E+17 $\pm$ 2.60%	9.0013E+17 $\pm$ 2.58%	8.6859E+02
1250.00	8.6595E+14 $\pm$ 18.84%	3.8207E+15 $\pm$ 9.26%	3.5529E+15 $\pm$ 9.84%	3.8145E+17 $\pm$ 3.23%	3.8969E+17 $\pm$ 3.17%	4.4050E+02
1450.00	7.2235E+14 $\pm$ 22.74%	2.5166E+15 $\pm$ 12.11%	2.4770E+15 $\pm$ 11.21%	2.2209E+17 $\pm$ 3.74%	2.2781E+17 $\pm$ 3.66%	3.0746E+02
1650.00	3.6702E+14 $\pm$ 22.72%	2.0556E+15 $\pm$ 12.09%	2.4103E+15 $\pm$ 12.62%	4.0007E+17 $\pm$ 4.09%	4.0490E+17 $\pm$ 4.05%	1.0900E+03
1850.00	5.2527E+14 $\pm$ 26.35%	1.8033E+15 $\pm$ 13.33%	1.5025E+15 $\pm$ 14.32%	3.5510E+17 $\pm$ 4.33%	3.5893E+17 $\pm$ 4.28%	6.7603E+02
2115.95	7.0104E+14 $\pm$ 17.88%	1.6719E+15 $\pm$ 11.92%	1.4188E+15 $\pm$ 12.54%	1.5677E+17 $\pm$ 4.89%	1.6056E+17 $\pm$ 4.78%	2.2363E+02

Table D-50. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Safety Shutdown Rod 6 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	2.7162E+16 $\pm$ 14.64%	1.1595E+17 $\pm$ 9.18%	8.7474E+16 $\pm$ 8.57%	1.1113E+18 $\pm$ 1.63%	1.3419E+18 $\pm$ 1.77%	4.0913E+01
950.00	5.2676E+15 $\pm$ 23.44%	3.3301E+16 $\pm$ 14.51%	2.4611E+16 $\pm$ 15.96%	4.2219E+17 $\pm$ 2.51%	4.8537E+17 $\pm$ 2.62%	8.0148E+01
1075.00	b	9.3281E+15 $\pm$ 22.17%	6.0874E+15 $\pm$ 22.72%	2.0803E+17 $\pm$ 2.87%	2.2589E+17 $\pm$ 2.91%	
1250.00	1.0352E+15 $\pm$ 27.10%	6.3154E+15 $\pm$ 29.04%	1.5197E+15 $\pm$ 12.04%	9.1722E+16 $\pm$ 3.55%	1.0059E+17 $\pm$ 3.74%	8.8604E+01
1450.00	7.1939E+14 $\pm$ 20.99%	2.7059E+15 $\pm$ 13.55%	7.3800E+14 $\pm$ 17.93%	6.0315E+16 $\pm$ 4.29%	6.4479E+16 $\pm$ 4.08%	8.3843E+01

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-51. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Safety Shutdown Rod 6 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	5.8223E+16 $\pm$ 15.41%	3.5073E+17 $\pm$ 7.16%	5.4432E+17 $\pm$ 5.69%	1.0572E+19 $\pm$ 1.49%	1.1525E+19 $\pm$ 1.43%	1.8157E+02
850.00	2.6679E+16 $\pm$ 17.31%	1.1848E+17 $\pm$ 9.47%	1.1160E+17 $\pm$ 11.28%	1.3096E+18 $\pm$ 2.79%	1.5664E+18 $\pm$ 2.63%	4.9089E+01
950.00	6.5151E+15 $\pm$ 28.57%	3.9999E+16 $\pm$ 17.35%	2.8287E+16 $\pm$ 20.29%	2.7867E+17 $\pm$ 5.32%	3.5347E+17 $\pm$ 5.04%	4.2772E+01
1075.00	b	8.6132E+15 $\pm$ 20.19%	5.9802E+15 $\pm$ 26.13%	1.3898E+17 $\pm$ 6.42%	1.5755E+17 $\pm$ 5.99%	
1250.00	9.3010E+14 $\pm$ 25.91%	5.9570E+15 $\pm$ 25.76%	1.4633E+15 $\pm$ 14.34%	5.9118E+16 $\pm$ 7.02%	6.7468E+16 $\pm$ 6.59%	6.3561E+01
1450.00	8.3827E+14 $\pm$ 27.20%	2.6899E+15 $\pm$ 15.52%	8.7855E+14 $\pm$ 23.58%	5.0651E+16 $\pm$ 8.12%	5.5058E+16 $\pm$ 7.54%	6.0424E+01
1650.00	6.4000E+14 $\pm$ 25.83%	2.1531E+15 $\pm$ 15.33%	2.0235E+15 $\pm$ 15.64%	3.7228E+17 $\pm$ 4.48%	3.7710E+17 $\pm$ 4.42%	5.8170E+02
1850.00	6.8208E+14 $\pm$ 25.09%	2.3366E+15 $\pm$ 13.98%	1.8834E+15 $\pm$ 15.40%	3.0645E+17 $\pm$ 4.66%	3.1136E+17 $\pm$ 4.59%	4.4929E+02
2115.95	3.3850E+14 $\pm$ 23.18%	1.3706E+15 $\pm$ 14.75%	1.5402E+15 $\pm$ 13.74%	1.4120E+17 $\pm$ 5.31%	1.4445E+17 $\pm$ 5.20%	4.1715E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-52. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 6 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	5.6290E+16 $\pm$ 12.90%	3.1756E+17 $\pm$ 5.96%	5.8149E+17 $\pm$ 5.03%	1.0892E+19 $\pm$ 1.39%	1.1847E+19 $\pm$ 1.33%	1.9349E+02
850.00	2.4496E+16 $\pm$ 14.11%	1.1277E+17 $\pm$ 7.14%	1.5357E+17 $\pm$ 6.64%	3.6267E+18 $\pm$ 1.57%	3.9175E+18 $\pm$ 1.50%	1.4805E+02
950.00	5.8003E+15 $\pm$ 21.89%	3.3661E+16 $\pm$ 11.54%	4.7420E+16 $\pm$ 13.10%	1.6650E+18 $\pm$ 2.21%	1.7518E+18 $\pm$ 2.16%	2.8705E+02
1075.00	b	1.1714E+16 $\pm$ 23.92%	1.0206E+16 $\pm$ 19.41%	8.2693E+17 $\pm$ 2.57%	8.5084E+17 $\pm$ 2.53%	
1250.00	1.1551E+15 $\pm$ 22.62%	6.0730E+15 $\pm$ 23.29%	3.1889E+15 $\pm$ 9.33%	3.7834E+17 $\pm$ 3.27%	3.8876E+17 $\pm$ 3.21%	3.2754E+02
1450.00	7.7143E+14 $\pm$ 20.38%	3.2320E+15 $\pm$ 11.81%	1.7815E+15 $\pm$ 13.32%	2.1117E+17 $\pm$ 3.99%	2.1695E+17 $\pm$ 3.90%	2.7374E+02
1650.00	6.0634E+14 $\pm$ 20.92%	2.0742E+15 $\pm$ 13.34%	1.7755E+15 $\pm$ 14.66%	3.8722E+17 $\pm$ 4.26%	3.9167E+17 $\pm$ 4.21%	6.3861E+02
1850.00	5.9585E+14 $\pm$ 21.12%	2.0716E+15 $\pm$ 13.09%	1.8745E+15 $\pm$ 13.91%	3.2611E+17 $\pm$ 4.52%	3.3065E+17 $\pm$ 4.46%	5.4730E+02
2115.95	3.5362E+14 $\pm$ 19.96%	1.4769E+15 $\pm$ 12.53%	1.3434E+15 $\pm$ 13.56%	1.4337E+17 $\pm$ 4.89%	1.4655E+17 $\pm$ 4.80%	4.0543E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-53. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	2.5710E+16 $\pm$ 13.99%	1.3131E+17 $\pm$ 8.82%	8.7552E+16 $\pm$ 8.64%	1.0369E+18 $\pm$ 1.67%	1.2814E+18 $\pm$ 1.78%	4.0329E+01
950.00	b	4.1350E+16 $\pm$ 13.15%	2.7071E+16 $\pm$ 17.10%	4.1601E+17 $\pm$ 2.56%	4.9159E+17 $\pm$ 2.71%	
1075.00	8.9159E+14 $\pm$ 18.68%	9.7130E+15 $\pm$ 20.04%	5.0264E+15 $\pm$ 16.58%	2.0611E+17 $\pm$ 2.95%	2.2174E+17 $\pm$ 2.92%	2.3117E+02
1250.00	6.7743E+14 $\pm$ 20.66%	b	1.6103E+15 $\pm$ 12.17%	9.2208E+16 $\pm$ 3.55%	1.0096E+17 $\pm$ 4.23%	1.3612E+02
1450.00	5.4212E+14 $\pm$ 23.94%	2.2354E+15 $\pm$ 14.02%	1.1171E+15 $\pm$ 16.75%	5.6148E+16 $\pm$ 4.23%	6.0043E+16 $\pm$ 4.02%	1.0357E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-54. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	$6.7963E+16 \pm 14.83\%$	$3.5239E+17 \pm 6.71\%$	$5.0968E+17 \pm 5.68\%$	$9.9537E+18 \pm 1.51\%$	$1.0884E+19 \pm 1.45\%$	$1.4646E+02$
850.00	$2.3955E+16 \pm 16.17\%$	$1.3657E+17 \pm 9.81\%$	$1.1249E+17 \pm 11.75\%$	$1.1456E+18 \pm 2.76\%$	$1.4186E+18 \pm 2.64\%$	$4.7823E+01$
950.00	b	$4.0581E+16 \pm 19.57\%$	$2.3939E+16 \pm 20.97\%$	$2.7552E+17 \pm 5.16\%$	$3.4951E+17 \pm 4.98\%$	
1075.00	$1.0562E+15 \pm 22.22\%$	$6.8732E+15 \pm 10.67\%$	$5.1316E+15 \pm 21.10\%$	$1.4358E+17 \pm 5.95\%$	$1.5664E+17 \pm 5.53\%$	$1.3594E+02$
1250.00	$6.9808E+14 \pm 24.58\%$	$4.1622E+15 \pm 17.80\%$	$1.5890E+15 \pm 16.46\%$	$5.3313E+16 \pm 7.54\%$	$5.9762E+16 \pm 6.87\%$	$7.6371E+01$
1450.00	$6.2345E+14 \pm 25.76\%$	$2.0401E+15 \pm 14.38\%$	$1.1890E+15 \pm 18.57\%$	$4.1114E+16 \pm 8.34\%$	$4.4967E+16 \pm 7.68\%$	$6.5947E+01$
1650.00	$5.1160E+14 \pm 24.85\%$	$2.1447E+15 \pm 16.16\%$	$1.5077E+15 \pm 17.28\%$	$3.4525E+17 \pm 4.61\%$	$3.4941E+17 \pm 4.56\%$	$6.7484E+02$
1850.00	$4.9792E+14 \pm 25.92\%$	$1.6486E+15 \pm 16.70\%$	$1.6247E+15 \pm 17.01\%$	$3.1189E+17 \pm 4.95\%$	$3.1566E+17 \pm 4.90\%$	$6.2638E+02$
2115.95	$5.7011E+14 \pm 20.03\%$	$1.4472E+15 \pm 14.31\%$	$1.3861E+15 \pm 13.99\%$	$1.4222E+17 \pm 5.26\%$	$1.4562E+17 \pm 5.15\%$	$2.4946E+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-55. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	$7.2745E+16 \pm 13.28\%$	$3.4319E+17 \pm 5.89\%$	$5.2260E+17 \pm 4.99\%$	$1.0416E+19 \pm 1.41\%$	$1.1354E+19 \pm 1.34\%$	$1.4318E+02$
850.00	$3.0723E+16 \pm 12.58\%$	$1.3025E+17 \pm 6.84\%$	$1.7374E+17 \pm 7.18\%$	$3.5415E+18 \pm 1.60\%$	$3.8762E+18 \pm 1.54\%$	$1.1527E+02$
950.00	$6.6538E+15 \pm 21.93\%$	$5.0090E+16 \pm 12.14\%$	$6.3857E+16 \pm 11.82\%$	$1.6669E+18 \pm 2.24\%$	$1.7875E+18 \pm 2.18\%$	$2.5051E+02$
1075.00	$1.2202E+15 \pm 17.85\%$	$9.6726E+15 \pm 17.62\%$	$1.3049E+16 \pm 15.08\%$	$8.1696E+17 \pm 2.53\%$	$8.4090E+17 \pm 2.48\%$	$6.6953E+02$
1250.00	$7.3495E+14 \pm 18.66\%$	$4.7591E+15 \pm 11.59\%$	$4.0358E+15 \pm 14.27\%$	$3.6462E+17 \pm 3.24\%$	$3.7415E+17 \pm 3.17\%$	$4.9612E+02$
1450.00	$6.3788E+14 \pm 19.52\%$	$2.3362E+15 \pm 11.97\%$	$1.9605E+15 \pm 14.25\%$	$2.1103E+17 \pm 4.01\%$	$2.1596E+17 \pm 3.93\%$	$3.3082E+02$
1650.00	$6.2422E+14 \pm 21.57\%$	$2.0734E+15 \pm 14.21\%$	$1.7415E+15 \pm 14.96\%$	$3.6419E+17 \pm 4.34\%$	$3.6863E+17 \pm 4.29\%$	$5.8343E+02$
1850.00	$4.2960E+14 \pm 21.92\%$	$1.7289E+15 \pm 19.46\%$	$1.9891E+15 \pm 14.78\%$	$3.0981E+17 \pm 4.51\%$	$3.1396E+17 \pm 4.45\%$	$7.2116E+02$
2115.95	$5.5772E+14 \pm 17.59\%$	$1.9498E+15 \pm 11.60\%$	$1.4667E+15 \pm 12.42\%$	$1.4878E+17 \pm 5.04\%$	$1.5275E+17 \pm 4.92\%$	$2.6676E+02$

Table D-56. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 8 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
850.00	$2.9669\text{E}+16 \pm 16.80\%$	$1.2174\text{E}+17 \pm 8.76\%$	$7.9389\text{E}+16 \pm 9.51\%$	$1.0718\text{E}+18 \pm 1.64\%$	$1.3026\text{E}+18 \pm 1.80\%$	$3.6126\text{E}+01$
950.00	$6.1824\text{E}+15 \pm 26.17\%$	$3.9532\text{E}+16 \pm 15.39\%$	$1.9846\text{E}+16 \pm 16.82\%$	$4.0507\text{E}+17 \pm 2.64\%$	$4.7063\text{E}+17 \pm 2.78\%$	$6.5519\text{E}+01$
1075.00	b	$7.5067\text{E}+15 \pm 11.82\%$	$5.1424\text{E}+15 \pm 20.71\%$	$2.0673\text{E}+17 \pm 2.99\%$	$2.2172\text{E}+17 \pm 3.00\%$	
1250.00	$6.4770\text{E}+14 \pm 28.72\%$	$5.2495\text{E}+15 \pm 23.97\%$	$1.6244\text{E}+15 \pm 12.04\%$	$9.2999\text{E}+16 \pm 3.60\%$	$1.0052\text{E}+17 \pm 3.58\%$	$1.4358\text{E}+02$
1450.00	$3.8126\text{E}+14 \pm 26.54\%$	$2.5004\text{E}+15 \pm 14.55\%$	$8.5567\text{E}+14 \pm 15.37\%$	$5.6351\text{E}+16 \pm 4.38\%$	$6.0088\text{E}+16 \pm 4.17\%$	$1.4780\text{E}+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-57. Four-group Neutron Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 8 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	$8.2061\text{E}+16 \pm 13.72\%$	$3.0322\text{E}+17 \pm 7.22\%$	$5.1917\text{E}+17 \pm 5.75\%$	$1.0463\text{E}+19 \pm 1.49\%$	$1.1367\text{E}+19 \pm 1.43\%$	$1.2750\text{E}+02$
850.00	$3.3299\text{E}+16 \pm 21.39\%$	$1.1669\text{E}+17 \pm 9.33\%$	$1.0289\text{E}+17 \pm 11.38\%$	$1.2475\text{E}+18 \pm 2.70\%$	$1.5004\text{E}+18 \pm 2.56\%$	$3.7465\text{E}+01$
950.00	b	$4.0593\text{E}+16 \pm 15.58\%$	$1.9394\text{E}+16 \pm 16.82\%$	$2.5237\text{E}+17 \pm 5.52\%$	$3.2376\text{E}+17 \pm 5.40\%$	
1075.00	b	$9.2300\text{E}+15 \pm 23.14\%$	$7.2614\text{E}+15 \pm 22.47\%$	$1.2336\text{E}+17 \pm 6.30\%$	$1.4127\text{E}+17 \pm 5.92\%$	
1250.00	b	$3.9312\text{E}+15 \pm 12.87\%$	$1.5573\text{E}+15 \pm 14.18\%$	$6.2121\text{E}+16 \pm 7.74\%$	$6.8249\text{E}+16 \pm 7.11\%$	
1450.00	$3.0711\text{E}+14 \pm 29.66\%$	$2.0959\text{E}+15 \pm 14.44\%$	$1.0026\text{E}+15 \pm 20.26\%$	$4.2361\text{E}+16 \pm 8.20\%$	$4.5767\text{E}+16 \pm 7.64\%$	$1.3793\text{E}+02$
1650.00	$7.7715\text{E}+14 \pm 21.69\%$	$2.0441\text{E}+15 \pm 13.33\%$	$1.6531\text{E}+15 \pm 15.07\%$	$3.8883\text{E}+17 \pm 4.58\%$	$3.9331\text{E}+17 \pm 4.53\%$	$5.0033\text{E}+02$
1850.00	$6.9506\text{E}+14 \pm 23.48\%$	$2.4112\text{E}+15 \pm 14.94\%$	$1.6841\text{E}+15 \pm 15.42\%$	$3.2763\text{E}+17 \pm 4.83\%$	$3.3242\text{E}+17 \pm 4.77\%$	$4.7137\text{E}+02$
2115.95	$5.4656\text{E}+14 \pm 19.79\%$	$1.6092\text{E}+15 \pm 12.90\%$	$1.6001\text{E}+15 \pm 14.60\%$	$1.5808\text{E}+17 \pm 5.42\%$	$1.6184\text{E}+17 \pm 5.30\%$	$2.8924\text{E}+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-58. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Safety Shutdown Rod 8 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
767.62	7.1017E+16 $\pm$ 12.54%	3.2555E+17 $\pm$ 6.24%	4.9470E+17 $\pm$ 5.01%	1.1097E+19 $\pm$ 1.37%	1.1988E+19 $\pm$ 1.32%	1.5626E+02
850.00	2.6672E+16 $\pm$ 15.27%	1.3977E+17 $\pm$ 8.10%	1.4847E+17 $\pm$ 7.30%	3.6396E+18 $\pm$ 1.56%	3.9545E+18 $\pm$ 1.51%	1.3645E+02
950.00	9.2124E+15 $\pm$ 28.15%	3.9249E+16 $\pm$ 12.01%	4.1169E+16 $\pm$ 11.87%	1.5965E+18 $\pm$ 2.18%	1.6861E+18 $\pm$ 2.13%	1.7330E+02
1075.00	b	7.8295E+15 $\pm$ 9.73%	1.1403E+16 $\pm$ 19.92%	8.6067E+17 $\pm$ 2.56%	8.8196E+17 $\pm$ 2.53%	
1250.00	4.9843E+14 $\pm$ 20.75%	5.1238E+15 $\pm$ 12.80%	2.8993E+15 $\pm$ 8.88%	3.7408E+17 $\pm$ 3.36%	3.8260E+17 $\pm$ 3.30%	7.5051E+02
1450.00	6.3993E+14 $\pm$ 19.34%	2.5908E+15 $\pm$ 11.13%	1.6367E+15 $\pm$ 11.81%	2.1453E+17 $\pm$ 3.90%	2.1940E+17 $\pm$ 3.82%	3.3524E+02
1650.00	8.6228E+14 $\pm$ 20.31%	2.1158E+15 $\pm$ 12.99%	1.6802E+15 $\pm$ 13.83%	3.8638E+17 $\pm$ 4.15%	3.9104E+17 $\pm$ 4.10%	4.4809E+02
1850.00	8.0093E+14 $\pm$ 20.02%	2.1777E+15 $\pm$ 13.79%	1.8035E+15 $\pm$ 13.38%	3.4032E+17 $\pm$ 4.51%	3.4511E+17 $\pm$ 4.45%	4.2491E+02
2115.95	6.4329E+14 $\pm$ 17.14%	1.9738E+15 $\pm$ 10.76%	1.8000E+15 $\pm$ 12.02%	1.6026E+17 $\pm$ 4.99%	1.6468E+17 $\pm$ 4.87%	2.4912E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-59. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-1 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
26.85	3.5297E+17 $\pm$ 5.52%	1.7730E+18 $\pm$ 2.80%	2.3854E+18 $\pm$ 2.45%	3.4742E+19 $\pm$ 0.66%	3.9254E+19 $\pm$ 0.63%	9.8430E+01
78.70	2.6277E+17 $\pm$ 5.28%	1.3324E+18 $\pm$ 2.57%	1.8941E+18 $\pm$ 2.13%	3.3116E+19 $\pm$ 0.57%	3.6605E+19 $\pm$ 0.55%	1.2603E+02
153.70	1.5097E+17 $\pm$ 5.49%	7.6159E+17 $\pm$ 2.67%	1.1885E+18 $\pm$ 2.15%	2.8853E+19 $\pm$ 0.51%	3.0954E+19 $\pm$ 0.50%	1.9112E+02
253.70	7.5493E+16 $\pm$ 7.26%	3.4433E+17 $\pm$ 3.82%	6.1308E+17 $\pm$ 2.97%	2.3091E+19 $\pm$ 0.55%	2.4124E+19 $\pm$ 0.54%	3.0587E+02
353.70	4.3839E+16 $\pm$ 8.99%	1.9612E+17 $\pm$ 5.05%	3.0896E+17 $\pm$ 4.21%	1.7901E+19 $\pm$ 0.61%	1.8450E+19 $\pm$ 0.60%	4.0834E+02
453.70	2.3542E+16 $\pm$ 10.40%	1.1161E+17 $\pm$ 6.11%	1.6451E+17 $\pm$ 5.47%	1.3762E+19 $\pm$ 0.66%	1.4061E+19 $\pm$ 0.66%	5.8455E+02
553.70	1.9476E+16 $\pm$ 14.85%	7.1665E+16 $\pm$ 7.73%	1.0766E+17 $\pm$ 7.27%	1.0650E+19 $\pm$ 0.75%	1.0849E+19 $\pm$ 0.73%	5.4684E+02
653.70	8.5453E+15 $\pm$ 20.77%	3.6628E+16 $\pm$ 10.24%	6.6497E+16 $\pm$ 8.69%	8.3718E+18 $\pm$ 0.83%	8.4835E+18 $\pm$ 0.82%	9.7970E+02
753.70	5.0290E+15 $\pm$ 23.67%	2.8551E+16 $\pm$ 15.00%	4.5515E+16 $\pm$ 10.97%	6.7143E+18 $\pm$ 0.92%	6.7934E+18 $\pm$ 0.92%	1.3351E+03
872.70	3.9444E+15 $\pm$ 17.09%	1.8700E+16 $\pm$ 14.98%	2.3322E+16 $\pm$ 12.76%	5.1543E+18 $\pm$ 0.98%	5.2003E+18 $\pm$ 0.98%	1.3067E+03
1010.70	3.4525E+15 $\pm$ 16.68%	1.3437E+16 $\pm$ 13.81%	1.5250E+16 $\pm$ 15.14%	3.5971E+18 $\pm$ 1.14%	3.6292E+18 $\pm$ 1.12%	1.0419E+03
1148.70	2.7750E+15 $\pm$ 9.58%	1.0624E+16 $\pm$ 13.98%	1.2940E+16 $\pm$ 18.18%	2.4882E+18 $\pm$ 1.34%	2.5145E+18 $\pm$ 1.33%	8.9663E+02
1286.70	3.3342E+15 $\pm$ 17.30%	7.1857E+15 $\pm$ 8.46%	6.5342E+15 $\pm$ 21.19%	1.5649E+18 $\pm$ 1.62%	1.5819E+18 $\pm$ 1.60%	4.6935E+02
1426.85	8.8874E+14 $\pm$ 11.38%	3.4386E+15 $\pm$ 21.24%	3.5630E+15 $\pm$ 23.75%	5.6027E+17 $\pm$ 1.97%	5.6816E+17 $\pm$ 1.96%	6.3040E+02

Table D-60. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-1 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
18.70	4.1892E+17 ±	4.56%	1.9230E+18 ±	2.14%	2.6460E+18 ±	1.86%	3.7104E+19 ±	0.59%	4.2092E+19 ±	0.55%	8.8571E+01
78.70	2.3848E+17 ±	6.39%	1.2481E+18 ±	3.01%	1.8608E+18 ±	2.48%	3.3976E+19 ±	0.63%	3.7323E+19 ±	0.61%	1.4247E+02
153.70	1.3670E+17 ±	6.17%	7.2791E+17 ±	3.04%	1.1655E+18 ±	2.42%	2.9724E+19 ±	0.56%	3.1754E+19 ±	0.53%	2.1743E+02
253.70	6.4673E+16 ±	8.45%	2.9957E+17 ±	4.33%	5.8219E+17 ±	3.52%	2.3295E+19 ±	0.60%	2.4242E+19 ±	0.59%	3.6020E+02
353.70	4.0470E+16 ±	8.83%	1.6547E+17 ±	5.60%	2.7962E+17 ±	4.48%	1.8004E+19 ±	0.67%	1.8490E+19 ±	0.66%	4.4488E+02
453.70	2.1457E+16 ±	9.85%	1.0180E+17 ±	6.85%	1.4084E+17 ±	7.14%	1.3871E+19 ±	0.74%	1.4135E+19 ±	0.73%	6.4645E+02
553.70	1.5351E+16 ±	12.03%	5.7403E+16 ±	8.82%	8.4000E+16 ±	7.93%	1.0584E+19 ±	0.82%	1.0741E+19 ±	0.82%	6.8948E+02
653.70	8.1716E+15 ±	24.57%	3.1010E+16 ±	10.74%	4.6686E+16 ±	9.40%	8.3402E+18 ±	0.91%	8.4261E+18 ±	0.90%	1.0206E+03
753.70	3.9084E+15 ±	19.92%	2.1102E+16 ±	13.21%	3.1465E+16 ±	12.53%	6.7107E+18 ±	1.02%	6.7671E+18 ±	1.02%	1.7170E+03
872.70	3.7362E+15 ±	13.47%	1.2852E+16 ±	10.80%	1.5729E+16 ±	11.88%	5.1275E+18 ±	1.05%	5.1598E+18 ±	1.05%	1.3724E+03
1010.70	2.9482E+15 ±	12.28%	1.3910E+16 ±	22.66%	1.0309E+16 ±	14.32%	3.5551E+18 ±	1.23%	3.5822E+18 ±	1.23%	1.2059E+03
1148.70	2.6577E+15 ±	8.97%	9.0353E+15 ±	11.48%	9.1127E+15 ±	14.80%	2.4387E+18 ±	1.47%	2.4595E+18 ±	1.46%	9.1760E+02
1286.70	3.5705E+15 ±	14.91%	7.0257E+15 ±	8.04%	4.5077E+15 ±	10.91%	1.5415E+18 ±	1.78%	1.5567E+18 ±	1.76%	4.3175E+02
1426.85	9.8988E+14 ±	12.58%	2.2413E+15 ±	10.04%	2.2434E+15 ±	19.28%	5.2282E+17 ±	2.14%	5.2830E+17 ±	2.12%	5.2817E+02

Table D-61. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-2 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
26.85	3.6612E+17 ±	5.74%	1.7621E+18 ±	2.71%	2.3216E+18 ±	2.46%	3.4452E+19 ±	0.66%	3.8902E+19 ±	0.62%	9.4100E+01
78.70	2.5493E+17 ±	5.08%	1.2992E+18 ±	2.49%	1.8482E+18 ±	2.10%	3.2940E+19 ±	0.56%	3.6342E+19 ±	0.54%	1.2921E+02
153.70	1.6810E+17 ±	5.31%	8.0548E+17 ±	2.59%	1.2389E+18 ±	2.11%	2.8838E+19 ±	0.50%	3.1050E+19 ±	0.49%	1.7155E+02
253.70	8.4255E+16 ±	6.79%	4.0356E+17 ±	3.56%	6.6778E+17 ±	2.79%	2.3897E+19 ±	0.53%	2.5053E+19 ±	0.52%	2.8363E+02
353.70	5.0851E+16 ±	9.03%	2.2044E+17 ±	4.61%	3.6036E+17 ±	3.83%	1.9448E+19 ±	0.58%	2.0079E+19 ±	0.57%	3.8244E+02
453.70	3.1470E+16 ±	8.90%	1.2446E+17 ±	5.63%	2.0555E+17 ±	5.27%	1.5633E+19 ±	0.64%	1.5994E+19 ±	0.63%	4.9676E+02
553.70	2.0440E+16 ±	9.63%	7.7507E+16 ±	6.92%	1.1670E+17 ±	6.82%	1.2470E+19 ±	0.71%	1.2684E+19 ±	0.70%	6.1005E+02
653.70	9.9141E+15 ±	13.84%	5.5672E+16 ±	8.85%	6.7509E+16 ±	8.57%	9.9733E+18 ±	0.77%	1.0106E+19 ±	0.77%	1.0060E+03
753.70	7.3273E+15 ±	24.54%	3.0168E+16 ±	11.21%	3.7821E+16 ±	10.00%	7.8223E+18 ±	0.86%	7.8976E+18 ±	0.85%	1.0676E+03
872.70	4.6577E+15 ±	17.09%	2.0253E+16 ±	12.07%	2.8771E+16 ±	11.98%	5.8426E+18 ±	0.91%	5.8963E+18 ±	0.90%	1.2544E+03
1010.70	5.1103E+15 ±	21.99%	1.4437E+16 ±	13.63%	1.7030E+16 ±	15.53%	4.1572E+18 ±	1.06%	4.1938E+18 ±	1.05%	8.1350E+02
1148.70	2.7224E+15 ±	9.39%	1.0629E+16 ±	16.15%	1.0769E+16 ±	17.93%	2.8629E+18 ±	1.24%	2.8870E+18 ±	1.23%	1.0516E+03
1286.70	3.5412E+15 ±	17.76%	6.8882E+15 ±	8.27%	7.4948E+15 ±	22.10%	1.8109E+18 ±	1.50%	1.8288E+18 ±	1.49%	5.1137E+02
1426.85	1.3788E+15 ±	23.20%	2.9089E+15 ±	20.63%	3.3241E+15 ±	27.71%	6.2670E+17 ±	1.89%	6.3431E+17 ±	1.89%	4.5452E+02

Table D-62. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Beam Tube HB-2 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
18.70	3.9927E+17 ±	4.33%	2.0231E+18 ±	2.18%	2.5941E+18 ±	1.88%	3.6839E+19 ±	0.58%	4.1855E+19 ±	0.55%	9.2265E+01
78.70	2.5758E+17 ±	6.33%	1.2875E+18 ±	2.94%	1.8257E+18 ±	2.44%	3.3358E+19 ±	0.62%	3.6729E+19 ±	0.60%	1.2951E+02
153.70	1.3573E+17 ±	5.57%	7.3523E+17 ±	2.96%	1.2042E+18 ±	2.41%	2.9248E+19 ±	0.54%	3.1323E+19 ±	0.52%	2.1549E+02
253.70	7.2370E+16 ±	7.25%	3.8415E+17 ±	4.17%	6.4193E+17 ±	3.22%	2.4175E+19 ±	0.58%	2.5273E+19 ±	0.57%	3.3404E+02
353.70	4.0717E+16 ±	8.73%	1.9615E+17 ±	5.38%	3.0726E+17 ±	4.45%	1.9657E+19 ±	0.64%	2.0201E+19 ±	0.63%	4.8277E+02
453.70	2.6198E+16 ±	7.09%	1.1854E+17 ±	6.35%	1.7335E+17 ±	6.07%	1.5769E+19 ±	0.70%	1.6087E+19 ±	0.70%	6.0193E+02
553.70	2.0265E+16 ±	9.44%	6.8495E+16 ±	7.10%	9.6148E+16 ±	7.92%	1.2607E+19 ±	0.78%	1.2792E+19 ±	0.78%	6.2212E+02
653.70	1.0271E+16 ±	14.94%	4.1187E+16 ±	8.74%	6.5393E+16 ±	9.80%	1.0019E+19 ±	0.85%	1.0136E+19 ±	0.85%	9.7540E+02
753.70	4.5746E+15 ±	23.88%	2.6298E+16 ±	13.25%	3.1927E+16 ±	10.30%	7.8318E+18 ±	0.95%	7.8946E+18 ±	0.95%	1.7120E+03
872.70	4.3807E+15 ±	21.48%	1.7778E+16 ±	14.11%	1.9345E+16 ±	11.15%	5.8135E+18 ±	0.99%	5.8549E+18 ±	0.99%	1.3270E+03
1010.70	b		1.2689E+16 ±	15.96%	1.3120E+16 ±	15.02%	4.1271E+18 ±	1.15%	4.1584E+18 ±	1.14%	
1148.70	2.5511E+15 ±	9.85%	1.0054E+16 ±	21.15%	9.5808E+15 ±	16.59%	2.8470E+18 ±	1.34%	2.8692E+18 ±	1.34%	1.1160E+03
1286.70	3.2979E+15 ±	11.93%	6.8617E+15 ±	12.22%	4.4556E+15 ±	8.96%	1.8003E+18 ±	1.63%	1.8150E+18 ±	1.62%	5.4591E+02
1426.85	1.1064E+15 ±	12.59%	2.2991E+15 ±	20.42%	2.1628E+15 ±	20.05%	5.7864E+17 ±	2.00%	5.8421E+17 ±	1.99%	5.2299E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-63. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-3 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
26.85	3.6963E+17	± 5.59%	1.7712E+18	± 2.77%	2.3975E+18	± 2.36%	3.5467E+19	± 0.66%	4.0006E+19	± 0.63%	9.5952E+01
78.70	2.7698E+17	± 5.46%	1.3053E+18	± 2.53%	1.8792E+18	± 2.12%	3.3580E+19	± 0.56%	3.7042E+19	± 0.54%	1.2124E+02
153.70	1.7203E+17	± 5.45%	7.9195E+17	± 2.60%	1.2328E+18	± 2.08%	2.9465E+19	± 0.50%	3.1662E+19	± 0.49%	1.7127E+02
253.70	8.5330E+16	± 6.95%	4.5737E+17	± 3.39%	7.0092E+17	± 2.73%	2.4364E+19	± 0.53%	2.5607E+19	± 0.52%	2.8552E+02
353.70	4.9388E+16	± 7.87%	2.2457E+17	± 4.45%	3.8424E+17	± 3.64%	1.9610E+19	± 0.58%	2.0269E+19	± 0.57%	3.9707E+02
453.70	3.2363E+16	± 10.10%	1.2961E+17	± 5.99%	2.0205E+17	± 5.17%	1.5662E+19	± 0.63%	1.6026E+19	± 0.63%	4.8396E+02
553.70	2.2360E+16	± 10.40%	8.6064E+16	± 7.30%	1.1231E+17	± 6.73%	1.2478E+19	± 0.70%	1.2699E+19	± 0.69%	5.5807E+02
653.70	1.0451E+16	± 14.88%	5.3649E+16	± 9.07%	7.6999E+16	± 8.92%	9.8293E+18	± 0.78%	9.9703E+18	± 0.77%	9.4051E+02
753.70	4.9276E+15	± 16.80%	2.8072E+16	± 10.78%	5.1721E+16	± 10.44%	7.7995E+18	± 0.86%	7.8842E+18	± 0.85%	1.5828E+03
872.70	5.7743E+15	± 19.62%	1.8940E+16	± 13.01%	2.4725E+16	± 12.93%	5.9598E+18	± 0.91%	6.0092E+18	± 0.90%	1.0321E+03
1010.70	3.3283E+15	± 13.42%	1.7052E+16	± 15.57%	1.4049E+16	± 14.23%	4.2773E+18	± 1.05%	4.3117E+18	± 1.05%	1.2851E+03
1148.70	3.1810E+15	± 25.23%	1.1057E+16	± 15.73%	1.1609E+16	± 17.84%	2.9430E+18	± 1.22%	2.9688E+18	± 1.22%	9.2516E+02
1286.70	2.7860E+15	± 10.16%	8.0455E+15	± 16.76%	8.5642E+15	± 19.19%	1.8599E+18	± 1.47%	1.8793E+18	± 1.46%	6.6759E+02
1426.85	9.3740E+14	± 11.35%	3.6585E+15	± 22.14%	b		6.6583E+17	± 1.84%	6.7367E+17	± 1.83%	7.1030E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-64. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-3 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
18.70	4.0259E+17	± 4.33%	1.9867E+18	± 2.14%	2.6674E+18	± 1.86%	3.7974E+19	± 0.58%	4.3031E+19	± 0.55%	9.4324E+01
78.70	2.7725E+17	± 6.45%	1.3150E+18	± 2.98%	1.8018E+18	± 2.47%	3.4526E+19	± 0.63%	3.7920E+19	± 0.60%	1.2453E+02
153.70	1.6365E+17	± 6.40%	7.4463E+17	± 2.92%	1.1924E+18	± 2.33%	2.9893E+19	± 0.54%	3.1994E+19	± 0.52%	1.8267E+02
253.70	7.7666E+16	± 8.51%	4.1894E+17	± 3.96%	6.6320E+17	± 3.02%	2.4682E+19	± 0.58%	2.5842E+19	± 0.57%	3.1780E+02
353.70	4.5732E+16	± 8.59%	2.2262E+17	± 5.11%	3.5247E+17	± 4.34%	1.9895E+19	± 0.64%	2.0515E+19	± 0.63%	4.3503E+02
453.70	2.9007E+16	± 9.72%	1.1716E+17	± 6.62%	1.7382E+17	± 5.58%	1.5827E+19	± 0.70%	1.6147E+19	± 0.70%	5.4564E+02
553.70	1.9843E+16	± 8.87%	7.5078E+16	± 7.98%	9.4854E+16	± 8.16%	1.2451E+19	± 0.77%	1.2641E+19	± 0.77%	6.2747E+02
653.70	1.0949E+16	± 15.53%	4.3074E+16	± 9.97%	5.3083E+16	± 8.84%	9.8910E+18	± 0.86%	9.9981E+18	± 0.86%	9.0340E+02
753.70	3.5810E+15	± 14.29%	2.5114E+16	± 11.51%	4.1802E+16	± 10.81%	7.8391E+18	± 0.93%	7.9096E+18	± 0.93%	2.1891E+03
872.70	4.9213E+15	± 18.66%	1.3947E+16	± 11.16%	2.0237E+16	± 13.36%	5.9743E+18	± 0.98%	6.0134E+18	± 0.98%	1.2140E+03
1010.70	3.1166E+15	± 10.58%	1.3637E+16	± 20.91%	1.4469E+16	± 22.21%	4.2613E+18	± 1.11%	4.2925E+18	± 1.12%	1.3673E+03
1148.70	2.9145E+15	± 12.31%	9.7413E+15	± 15.85%	6.0796E+15	± 12.04%	2.9469E+18	± 1.33%	2.9656E+18	± 1.33%	1.0111E+03
1286.70	2.7998E+15	± 9.55%	6.6537E+15	± 11.68%	6.5698E+15	± 18.70%	1.8406E+18	± 1.63%	1.8566E+18	± 1.62%	6.5742E+02
1426.85	8.7080E+14	± 10.93%	2.4406E+15	± 13.47%	1.8175E+15	± 26.08%	6.2815E+17	± 1.99%	6.3328E+17	± 1.98%	7.2134E+02

Table D-65. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-6 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
26.85	3.1756E+17 ±	5.85%	1.7315E+18 ±	2.74%	2.4392E+18 ±	2.37%	3.5958E+19 ±	0.66%	4.0447E+19 ±	0.62%	1.1323E+02
78.70	2.6006E+17 ±	5.46%	1.3593E+18 ±	2.52%	1.9560E+18 ±	2.11%	3.4067E+19 ±	0.56%	3.7642E+19 ±	0.54%	1.3100E+02
153.70	1.6579E+17 ±	5.21%	8.3947E+17 ±	2.62%	1.2940E+18 ±	2.09%	2.9771E+19 ±	0.50%	3.2070E+19 ±	0.48%	1.7957E+02
253.70	9.0746E+16 ±	7.10%	4.0877E+17 ±	3.45%	7.2131E+17 ±	2.74%	2.4314E+19 ±	0.53%	2.5535E+19 ±	0.52%	2.6793E+02
353.70	5.7397E+16 ±	8.27%	2.2899E+17 ±	4.61%	4.1028E+17 ±	3.72%	1.9443E+19 ±	0.58%	2.0140E+19 ±	0.57%	3.3875E+02
453.70	3.9319E+16 ±	9.08%	1.3180E+17 ±	5.68%	2.0983E+17 ±	5.04%	1.5455E+19 ±	0.63%	1.5836E+19 ±	0.63%	3.9306E+02
553.70	2.4667E+16 ±	9.86%	8.7816E+16 ±	6.64%	1.1945E+17 ±	6.54%	1.2212E+19 ±	0.70%	1.2444E+19 ±	0.69%	4.9506E+02
653.70	9.6479E+15 ±	16.17%	5.0794E+16 ±	8.68%	6.5435E+16 ±	8.36%	9.5507E+18 ±	0.78%	9.6766E+18 ±	0.77%	9.8992E+02
753.70	6.0822E+15 ±	20.91%	2.6743E+16 ±	11.59%	3.4515E+16 ±	10.74%	7.5078E+18 ±	0.86%	7.5752E+18 ±	0.85%	1.2344E+03
872.70	4.1495E+15 ±	16.10%	1.6868E+16 ±	12.53%	2.1109E+16 ±	11.13%	5.6016E+18 ±	0.91%	5.6437E+18 ±	0.90%	1.3500E+03
1010.70	5.2810E+15 ±	16.05%	1.4150E+16 ±	15.26%	1.5251E+16 ±	13.16%	3.9404E+18 ±	1.06%	3.9751E+18 ±	1.06%	7.4614E+02
1148.70	4.5788E+15 ±	21.66%	1.0864E+16 ±	10.85%	1.1273E+16 ±	16.32%	2.6816E+18 ±	1.25%	2.7083E+18 ±	1.25%	5.8565E+02
1286.70	3.0167E+15 ±	9.48%	8.5969E+15 ±	15.30%	7.2897E+15 ±	17.26%	1.7058E+18 ±	1.53%	1.7247E+18 ±	1.52%	5.6546E+02
1426.85	1.2838E+15 ±	21.72%	2.9951E+15 ±	22.12%	2.6751E+15 ±	20.23%	6.0459E+17 ±	1.90%	6.1154E+17 ±	1.89%	4.7095E+02

Table D-66. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-6 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
18.70	4.0275E+17 ±	4.30%	2.0200E+18 ±	2.17%	2.6173E+18 ±	1.82%	3.8289E+19 ±	0.58%	4.3329E+19 ±	0.55%	9.5070E+01
78.70	2.4197E+17 ±	6.63%	1.3545E+18 ±	3.04%	1.9860E+18 ±	2.50%	3.4693E+19 ±	0.62%	3.8276E+19 ±	0.60%	1.4338E+02
153.70	1.4532E+17 ±	5.95%	7.5827E+17 ±	2.88%	1.2497E+18 ±	2.29%	3.0252E+19 ±	0.54%	3.2406E+19 ±	0.52%	2.0818E+02
253.70	8.0014E+16 ±	7.57%	3.9707E+17 ±	4.12%	6.9870E+17 ±	3.15%	2.4710E+19 ±	0.58%	2.5886E+19 ±	0.57%	3.0882E+02
353.70	5.3513E+16 ±	8.77%	2.0844E+17 ±	5.31%	3.7741E+17 ±	4.01%	1.9722E+19 ±	0.64%	2.0361E+19 ±	0.62%	3.6854E+02
453.70	3.2703E+16 ±	11.28%	1.1126E+17 ±	6.25%	1.8792E+17 ±	5.47%	1.5727E+19 ±	0.70%	1.6059E+19 ±	0.70%	4.8090E+02
553.70	2.2941E+16 ±	8.79%	7.3314E+16 ±	6.68%	1.0994E+17 ±	7.17%	1.2326E+19 ±	0.77%	1.2532E+19 ±	0.77%	5.3730E+02
653.70	7.6924E+15 ±	11.76%	4.8342E+16 ±	11.94%	5.1172E+16 ±	8.18%	9.5567E+18 ±	0.86%	9.6639E+18 ±	0.86%	1.2424E+03
753.70	3.7799E+15 ±	11.41%	2.4361E+16 ±	16.44%	2.6433E+16 ±	11.25%	7.3869E+18 ±	0.95%	7.4415E+18 ±	0.95%	1.9542E+03
872.70	3.5971E+15 ±	18.05%	1.3002E+16 ±	14.86%	1.8675E+16 ±	13.06%	5.5878E+18 ±	0.99%	5.6231E+18 ±	0.98%	1.5534E+03
1010.70	4.1670E+15 ±	10.23%	1.0632E+16 ±	10.74%	1.2946E+16 ±	15.21%	3.9715E+18 ±	1.16%	3.9993E+18 ±	1.15%	9.5308E+02
1148.70	3.8261E+15 ±	14.28%	1.0044E+16 ±	10.33%	8.4238E+15 ±	18.21%	2.6336E+18 ±	1.37%	2.6559E+18 ±	1.36%	6.8833E+02
1286.70	3.1812E+15 ±	9.64%	7.6850E+15 ±	8.82%	6.2816E+15 ±	15.00%	1.6618E+18 ±	1.63%	1.6790E+18 ±	1.62%	5.2239E+02
1426.85	9.1775E+14 ±	11.64%	2.3489E+15 ±	16.08%	1.7215E+15 ±	10.65%	5.6667E+17 ±	1.99%	5.7166E+17 ±	1.98%	6.1745E+02

Table D-67. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-7 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
26.85	3.5303E+17 ±	5.58%	1.7563E+18 ±	2.77%	2.4179E+18 ±	2.38%	3.5189E+19 ±	0.65%	3.9716E+19 ±	0.62%	9.9675E+01
78.70	2.6395E+17 ±	5.42%	1.2959E+18 ±	2.56%	1.8419E+18 ±	2.12%	3.3200E+19 ±	0.56%	3.6601E+19 ±	0.54%	1.2578E+02
153.70	1.7153E+17 ±	5.46%	7.9999E+17 ±	2.59%	1.2020E+18 ±	2.13%	2.9142E+19 ±	0.50%	3.1316E+19 ±	0.49%	1.6989E+02
253.70	9.6920E+16 ±	7.09%	4.0420E+17 ±	3.60%	6.4971E+17 ±	2.86%	2.3876E+19 ±	0.53%	2.5027E+19 ±	0.52%	2.4635E+02
353.70	5.2709E+16 ±	8.42%	2.0577E+17 ±	4.63%	3.5453E+17 ±	3.97%	1.9185E+19 ±	0.58%	1.9798E+19 ±	0.58%	3.6398E+02
453.70	2.9398E+16 ±	8.05%	1.2145E+17 ±	5.44%	1.8811E+17 ±	5.04%	1.5115E+19 ±	0.63%	1.5454E+19 ±	0.63%	5.1414E+02
553.70	1.9098E+16 ±	9.47%	8.0928E+16 ±	6.75%	1.2730E+17 ±	6.49%	1.2088E+19 ±	0.70%	1.2315E+19 ±	0.69%	6.3293E+02
653.70	8.4970E+15 ±	12.92%	4.9214E+16 ±	8.77%	7.1847E+16 ±	8.31%	9.6751E+18 ±	0.77%	9.8046E+18 ±	0.76%	1.1387E+03
753.70	5.4624E+15 ±	24.66%	3.0231E+16 ±	12.13%	3.5763E+16 ±	9.71%	7.6937E+18 ±	0.86%	7.7652E+18 ±	0.85%	1.4085E+03
872.70	4.2810E+15 ±	11.87%	1.9776E+16 ±	14.55%	2.6786E+16 ±	12.82%	5.7302E+18 ±	0.91%	5.7810E+18 ±	0.90%	1.3385E+03
1010.70	3.7923E+15 ±	8.59%	1.6151E+16 ±	12.30%	1.1466E+16 ±	13.21%	3.9936E+18 ±	1.08%	4.0250E+18 ±	1.06%	1.0531E+03
1148.70	3.4041E+15 ±	9.27%	1.0612E+16 ±	10.46%	9.3103E+15 ±	13.00%	2.6834E+18 ±	1.26%	2.7068E+18 ±	1.25%	7.8831E+02
1286.70	2.6316E+15 ±	9.25%	6.9616E+15 ±	8.05%	8.0763E+15 ±	20.68%	1.7058E+18 ±	1.53%	1.7235E+18 ±	1.52%	6.4820E+02
1426.85	1.0098E+15 ±	11.93%	2.7611E+15 ±	18.31%	4.5850E+15 ±	29.38%	6.1153E+17 ±	1.93%	6.1988E+17 ±	1.92%	6.0561E+02

Table D-68. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-7 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
18.70	4.1501E+17 ±	4.24%	2.0001E+18 ±	2.17%	2.6831E+18 ±	1.87%	3.7263E+19 ±	0.58%	4.2361E+19 ±	0.55%	8.9787E+01
78.70	2.3555E+17 ±	5.95%	1.2535E+18 ±	2.90%	1.8037E+18 ±	2.43%	3.3946E+19 ±	0.62%	3.7239E+19 ±	0.60%	1.4412E+02
153.70	1.5615E+17 ±	6.11%	7.4313E+17 ±	2.97%	1.1195E+18 ±	2.38%	2.9591E+19 ±	0.54%	3.1610E+19 ±	0.52%	1.8951E+02
253.70	8.8690E+16 ±	7.96%	3.5879E+17 ±	4.14%	6.1262E+17 ±	3.32%	2.3961E+19 ±	0.58%	2.5021E+19 ±	0.57%	2.7017E+02
353.70	5.5933E+16 ±	10.66%	1.8030E+17 ±	5.13%	3.2452E+17 ±	4.60%	1.9326E+19 ±	0.64%	1.9886E+19 ±	0.63%	3.4552E+02
453.70	2.8333E+16 ±	11.09%	1.0517E+17 ±	7.00%	1.6362E+17 ±	5.94%	1.5263E+19 ±	0.70%	1.5560E+19 ±	0.69%	5.3868E+02
553.70	1.8661E+16 ±	9.05%	7.0007E+16 ±	6.41%	9.9439E+16 ±	7.80%	1.2208E+19 ±	0.77%	1.2396E+19 ±	0.76%	6.5418E+02
653.70	7.6918E+15 ±	10.54%	3.8205E+16 ±	9.72%	6.1560E+16 ±	8.26%	9.6629E+18 ±	0.85%	9.7704E+18 ±	0.85%	1.2563E+03
753.70	5.2823E+15 ±	21.38%	2.1800E+16 ±	10.80%	2.9650E+16 ±	10.07%	7.6174E+18 ±	0.94%	7.6742E+18 ±	0.94%	1.4421E+03
872.70	3.9212E+15 ±	9.51%	1.3983E+16 ±	9.03%	1.6759E+16 ±	12.77%	5.7320E+18 ±	0.99%	5.7666E+18 ±	0.98%	1.4618E+03
1010.70	3.7563E+15 ±	9.10%	1.3004E+16 ±	9.62%	8.8165E+15 ±	11.16%	3.9994E+18 ±	1.17%	4.0250E+18 ±	1.16%	1.0647E+03
1148.70	3.6331E+15 ±	8.49%	9.4804E+15 ±	7.68%	1.0373E+16 ±	20.00%	2.6027E+18 ±	1.36%	2.6262E+18 ±	1.36%	7.1639E+02
1286.70	2.8997E+15 ±	11.43%	6.4853E+15 ±	7.03%	5.5510E+15 ±	18.87%	1.6438E+18 ±	1.67%	1.6588E+18 ±	1.66%	5.6691E+02
1426.85	8.9332E+14 ±	12.47%	2.3541E+15 ±	14.65%	1.7363E+15 ±	14.99%	5.6239E+17 ±	2.02%	5.6737E+17 ±	2.02%	6.2955E+02

Table D-69. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-8 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
26.85	3.3978E+17	± 5.68%	1.7651E+18	± 2.72%	2.4187E+18	± 2.40%	3.5472E+19	± 0.65%	3.9995E+19	± 0.62%	1.0440E+02
78.70	2.5695E+17	± 5.12%	1.3521E+18	± 2.45%	1.9465E+18	± 2.11%	3.3621E+19	± 0.56%	3.7177E+19	± 0.54%	1.3085E+02
153.70	1.7498E+17	± 5.41%	7.9960E+17	± 2.57%	1.2747E+18	± 2.08%	2.9620E+19	± 0.49%	3.1869E+19	± 0.48%	1.6927E+02
253.70	9.1001E+16	± 6.94%	4.2979E+17	± 3.30%	7.5717E+17	± 2.68%	2.4224E+19	± 0.52%	2.5502E+19	± 0.51%	2.6620E+02
353.70	4.7330E+16	± 9.19%	2.6187E+17	± 4.53%	3.9876E+17	± 3.79%	1.9437E+19	± 0.57%	2.0145E+19	± 0.57%	4.1067E+02
453.70	3.2499E+16	± 11.38%	1.4590E+17	± 6.01%	1.9918E+17	± 5.11%	1.5528E+19	± 0.63%	1.5905E+19	± 0.63%	4.7779E+02
553.70	2.2761E+16	± 10.36%	7.7828E+16	± 6.50%	1.1119E+17	± 6.49%	1.2379E+19	± 0.70%	1.2591E+19	± 0.68%	5.4387E+02
653.70	1.0232E+16	± 11.51%	4.6372E+16	± 8.73%	6.6942E+16	± 8.36%	9.8705E+18	± 0.77%	9.9940E+18	± 0.76%	9.6464E+02
753.70	5.3394E+15	± 19.09%	2.7625E+16	± 11.24%	3.8006E+16	± 10.95%	7.8278E+18	± 0.84%	7.8988E+18	± 0.84%	1.4660E+03
872.70	4.9831E+15	± 18.87%	1.7227E+16	± 10.72%	2.6635E+16	± 12.46%	6.0376E+18	± 0.90%	6.0864E+18	± 0.90%	1.2116E+03
1010.70	4.7111E+15	± 24.76%	1.2328E+16	± 13.73%	1.3619E+16	± 12.68%	4.2381E+18	± 1.04%	4.2687E+18	± 1.04%	8.9959E+02
1148.70	3.2445E+15	± 11.62%	1.0416E+16	± 13.17%	1.3318E+16	± 17.13%	2.9457E+18	± 1.21%	2.9726E+18	± 1.21%	9.0790E+02
1286.70	3.5024E+15	± 14.46%	9.8428E+15	± 17.09%	1.0135E+16	± 23.46%	1.8683E+18	± 1.47%	1.8918E+18	± 1.46%	5.3345E+02
1426.85	1.0732E+15	± 13.37%	4.4422E+15	± 24.18%	4.4110E+15	± 24.33%	6.7109E+17	± 1.88%	6.8101E+17	± 1.87%	6.2531E+02

Table D-70. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-8 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
18.70	4.0262E+17 ±	4.57%	1.9814E+18 ±	2.11%	2.7393E+18 ±	1.86%	3.7979E+19 ±	0.58%	4.3103E+19 ±	0.55%	9.4331E+01
78.70	2.5317E+17 ±	5.99%	1.3150E+18 ±	2.97%	1.8953E+18 ±	2.40%	3.4698E+19 ±	0.62%	3.8162E+19 ±	0.60%	1.3706E+02
153.70	1.5424E+17 ±	5.69%	7.5127E+17 ±	2.89%	1.2279E+18 ±	2.39%	2.9997E+19 ±	0.53%	3.2131E+19 ±	0.52%	1.9449E+02
253.70	7.8763E+16 ±	7.48%	3.9310E+17 ±	3.90%	7.1593E+17 ±	3.15%	2.4578E+19 ±	0.57%	2.5766E+19 ±	0.57%	3.1205E+02
353.70	4.1395E+16 ±	8.07%	2.1754E+17 ±	4.73%	3.6331E+17 ±	4.23%	1.9553E+19 ±	0.64%	2.0175E+19 ±	0.62%	4.7234E+02
453.70	2.9379E+16 ±	8.57%	1.3672E+17 ±	6.45%	1.6594E+17 ±	6.30%	1.5685E+19 ±	0.70%	1.6017E+19 ±	0.69%	5.3389E+02
553.70	2.0214E+16 ±	10.22%	6.9620E+16 ±	8.30%	1.0594E+17 ±	7.40%	1.2451E+19 ±	0.76%	1.2646E+19 ±	0.76%	6.1594E+02
653.70	8.3208E+15 ±	10.51%	3.7627E+16 ±	8.34%	6.0690E+16 ±	9.52%	9.9266E+18 ±	0.84%	1.0033E+19 ±	0.84%	1.1930E+03
753.70	4.3491E+15 ±	19.09%	1.9307E+16 ±	10.63%	2.9271E+16 ±	11.85%	7.8491E+18 ±	0.93%	7.9020E+18 ±	0.93%	1.8048E+03
872.70	3.2600E+15 ±	9.70%	1.3620E+16 ±	9.95%	1.7441E+16 ±	12.45%	5.9576E+18 ±	0.96%	5.9919E+18 ±	0.96%	1.8275E+03
1010.70	3.4678E+15 ±	10.18%	1.1258E+16 ±	8.51%	1.2192E+16 ±	24.76%	4.2243E+18 ±	1.13%	4.2512E+18 ±	1.13%	1.2181E+03
1148.70	2.8321E+15 ±	10.89%	1.1327E+16 ±	15.85%	8.4887E+15 ±	15.82%	2.9290E+18 ±	1.31%	2.9516E+18 ±	1.31%	1.0342E+03
1286.70	3.4306E+15 ±	13.05%	7.6811E+15 ±	8.92%	7.3818E+15 ±	25.50%	1.8163E+18 ±	1.59%	1.8348E+18 ±	1.58%	5.2945E+02
1426.85	9.4036E+14 ±	11.74%	2.6852E+15 ±	13.82%	3.1945E+15 ±	23.45%	6.3751E+17 ±	2.00%	6.4433E+17 ±	1.99%	6.7795E+02

Table D-71. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-9 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)		Group 2 (100.0 - $\text{E}+05$ eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio
26.85	3.6978E+17 $\pm$ 5.64%		1.7913E+18 $\pm$ 2.79%		2.3532E+18 $\pm$ 2.41%		3.6733E+19 $\pm$ 0.65%		4.1247E+19 $\pm$ 0.62%	9.9337E+01
78.70	2.6545E+17 $\pm$ 5.16%		1.3298E+18 $\pm$ 2.50%		1.8774E+18 $\pm$ 2.11%		3.4758E+19 $\pm$ 0.55%		3.8231E+19 $\pm$ 0.53%	1.3094E+02
153.70	1.5924E+17 $\pm$ 5.40%		8.0452E+17 $\pm$ 2.65%		1.2088E+18 $\pm$ 2.15%		3.0726E+19 $\pm$ 0.50%		3.2898E+19 $\pm$ 0.48%	1.9295E+02
253.70	8.6386E+16 $\pm$ 6.90%		3.4160E+17 $\pm$ 3.88%		6.0194E+17 $\pm$ 3.00%		2.5157E+19 $\pm$ 0.53%		2.6187E+19 $\pm$ 0.52%	2.9122E+02
353.70	4.4936E+16 $\pm$ 9.00%		1.7895E+17 $\pm$ 5.03%		3.1514E+17 $\pm$ 4.08%		2.0155E+19 $\pm$ 0.58%		2.0694E+19 $\pm$ 0.57%	4.4854E+02
453.70	3.1098E+16 $\pm$ 10.44%		1.0900E+17 $\pm$ 5.81%		1.6942E+17 $\pm$ 5.41%		1.5814E+19 $\pm$ 0.63%		1.6124E+19 $\pm$ 0.63%	5.0854E+02
553.70	2.1245E+16 $\pm$ 12.21%		6.4859E+16 $\pm$ 6.90%		9.8616E+16 $\pm$ 7.19%		1.2514E+19 $\pm$ 0.70%		1.2699E+19 $\pm$ 0.69%	5.8902E+02
653.70	9.8738E+15 $\pm$ 17.06%		4.6735E+16 $\pm$ 10.17%		5.1140E+16 $\pm$ 9.32%		9.7981E+18 $\pm$ 0.78%		9.9058E+18 $\pm$ 0.76%	9.9233E+02
753.70	5.8027E+15 $\pm$ 23.40%		3.0911E+16 $\pm$ 12.58%		3.1580E+16 $\pm$ 12.13%		7.7924E+18 $\pm$ 0.86%		7.8607E+18 $\pm$ 0.85%	1.3429E+03
872.70	4.0228E+15 $\pm$ 27.62%		2.0020E+16 $\pm$ 12.21%		1.9537E+16 $\pm$ 12.27%		5.8800E+18 $\pm$ 0.90%		5.9235E+18 $\pm$ 0.89%	1.4617E+03
1010.70	3.4026E+15 $\pm$ 13.48%		1.3227E+16 $\pm$ 15.36%		1.5880E+16 $\pm$ 15.82%		4.1917E+18 $\pm$ 1.05%		4.2242E+18 $\pm$ 1.04%	1.2319E+03
1148.70	4.4726E+15 $\pm$ 28.19%		9.2379E+15 $\pm$ 10.19%		1.0463E+16 $\pm$ 18.41%		2.8510E+18 $\pm$ 1.23%		2.8752E+18 $\pm$ 1.23%	6.3745E+02
1286.70	2.8332E+15 $\pm$ 11.37%		7.8103E+15 $\pm$ 11.24%		6.7426E+15 $\pm$ 16.69%		1.8363E+18 $\pm$ 1.48%		1.8537E+18 $\pm$ 1.47%	6.4814E+02
1426.85	9.2533E+14 $\pm$ 10.78%		2.7313E+15 $\pm$ 12.92%		b		6.6511E+17 $\pm$ 1.82%		6.7168E+17 $\pm$ 1.81%	7.1878E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-72. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tube HB-9 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)		Group 2 (100.0 - $\text{E}+05$ eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio
18.70	4.1698E+17 $\pm$ 4.20%		2.0224E+18 $\pm$ 2.16%		2.7490E+18 $\pm$ 1.86%		3.8423E+19 $\pm$ 0.58%		4.3611E+19 $\pm$ 0.55%	9.2144E+01
78.70	2.5110E+17 $\pm$ 5.87%		1.3519E+18 $\pm$ 2.96%		1.9059E+18 $\pm$ 2.48%		3.5348E+19 $\pm$ 0.61%		3.8857E+19 $\pm$ 0.59%	1.4078E+02
153.70	1.3137E+17 $\pm$ 5.51%		7.4077E+17 $\pm$ 3.00%		1.1620E+18 $\pm$ 2.42%		3.1422E+19 $\pm$ 0.54%		3.3456E+19 $\pm$ 0.52%	2.3918E+02
253.70	7.1300E+16 $\pm$ 7.05%		3.1025E+17 $\pm$ 4.61%		5.7169E+17 $\pm$ 3.40%		2.5497E+19 $\pm$ 0.58%		2.6451E+19 $\pm$ 0.57%	3.5761E+02
353.70	4.2277E+16 $\pm$ 10.00%		1.6642E+17 $\pm$ 5.79%		2.7356E+17 $\pm$ 4.80%		2.0356E+19 $\pm$ 0.64%		2.0838E+19 $\pm$ 0.62%	4.8149E+02
453.70	2.4726E+16 $\pm$ 9.34%		1.0131E+17 $\pm$ 7.28%		1.4578E+17 $\pm$ 6.53%		1.5962E+19 $\pm$ 0.70%		1.6234E+19 $\pm$ 0.70%	6.4554E+02
553.70	1.6827E+16 $\pm$ 8.85%		5.9839E+16 $\pm$ 8.85%		8.2195E+16 $\pm$ 8.55%		1.2566E+19 $\pm$ 0.77%		1.2725E+19 $\pm$ 0.77%	7.4677E+02
653.70	8.2776E+15 $\pm$ 14.85%		3.2856E+16 $\pm$ 8.88%		4.5195E+16 $\pm$ 10.97%		9.7929E+18 $\pm$ 0.86%		9.8793E+18 $\pm$ 0.86%	1.1831E+03
753.70	4.7488E+15 $\pm$ 28.64%		2.2463E+16 $\pm$ 10.36%		2.2245E+16 $\pm$ 13.11%		7.8007E+18 $\pm$ 0.94%		7.8502E+18 $\pm$ 0.94%	1.6427E+03
872.70	3.5293E+15 $\pm$ 23.85%		1.5145E+16 $\pm$ 12.00%		1.3464E+16 $\pm$ 11.65%		5.8918E+18 $\pm$ 0.98%		5.9239E+18 $\pm$ 0.98%	1.6694E+03
1010.70	2.6230E+15 $\pm$ 10.44%		9.6221E+15 $\pm$ 13.24%		1.1866E+16 $\pm$ 16.00%		4.1792E+18 $\pm$ 1.15%		4.2034E+18 $\pm$ 1.14%	1.5933E+03
1148.70	3.4569E+15 $\pm$ 11.24%		8.8932E+15 $\pm$ 8.41%		6.3497E+15 $\pm$ 11.85%		2.8597E+18 $\pm$ 1.35%		2.8784E+18 $\pm$ 1.34%	8.2724E+02
1286.70	2.7203E+15 $\pm$ 11.56%		8.2321E+15 $\pm$ 17.51%		6.9328E+15 $\pm$ 23.16%		1.8169E+18 $\pm$ 1.64%		1.8348E+18 $\pm$ 1.63%	6.6791E+02
1426.85	8.6633E+14 $\pm$ 10.48%		2.7466E+15 $\pm$ 19.24%		1.9132E+15 $\pm$ 19.14%		6.2358E+17 $\pm$ 1.99%		6.2911E+17 $\pm$ 1.97%	7.1979E+02

Table D-73. Four-group Neutron Spectrum (m^2s^{-1}) in the Through Tube HB-5/HB-10 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1721.75	2.8347E+14 ± 21.10%	6.8619E+14 ± 17.04%	6.0674E+14 ± 16.03%	4.8622E+17 ± 2.25%	4.8779E+17 ± 2.24%	1.7152E+03
1475.00	1.3583E+15 ± 10.16%	2.7795E+15 ± 8.08%	2.5605E+15 ± 8.52%	1.3599E+18 ± 1.36%	1.3666E+18 ± 1.35%	1.0011E+03
1225.00	1.7515E+15 ± 8.77%	4.4018E+15 ± 6.31%	3.4851E+15 ± 6.55%	2.8531E+18 ± 1.04%	2.8627E+18 ± 1.03%	1.6289E+03
1000.00	1.8692E+15 ± 10.24%	5.1449E+15 ± 6.99%	4.5869E+15 ± 8.18%	4.5126E+18 ± 0.89%	4.5242E+18 ± 0.89%	2.4141E+03
825.00	1.4284E+15 ± 11.84%	4.9156E+15 ± 6.88%	6.3074E+15 ± 10.20%	6.2043E+18 ± 0.83%	6.2170E+18 ± 0.82%	4.3436E+03
675.00	1.8257E+15 ± 10.20%	9.1879E+15 ± 11.27%	1.0384E+16 ± 11.39%	7.9335E+18 ± 0.75%	7.9549E+18 ± 0.74%	4.3455E+03
525.00	5.0609E+15 ± 12.61%	1.4126E+16 ± 8.58%	1.4567E+16 ± 8.58%	9.7142E+18 ± 0.68%	9.7479E+18 ± 0.68%	1.9194E+03
375.00	7.4089E+15 ± 8.42%	2.1795E+16 ± 7.75%	2.5558E+16 ± 9.81%	1.1389E+19 ± 0.63%	1.1444E+19 ± 0.63%	1.5373E+03
250.00	1.0979E+16 ± 14.17%	2.5864E+16 ± 7.74%	3.1610E+16 ± 8.98%	1.2716E+19 ± 0.66%	1.2785E+19 ± 0.66%	1.1582E+03
150.00	1.1557E+16 ± 10.28%	3.5176E+16 ± 7.95%	3.7904E+16 ± 8.92%	1.3411E+19 ± 0.64%	1.3495E+19 ± 0.64%	1.1604E+03
50.00	9.9321E+15 ± 8.89%	3.5477E+16 ± 7.04%	4.7376E+16 ± 9.29%	1.3789E+19 ± 0.64%	1.3882E+19 ± 0.64%	1.3883E+03
-50.00	9.0585E+15 ± 7.04%	3.7836E+16 ± 7.70%	4.9889E+16 ± 8.77%	1.3705E+19 ± 0.63%	1.3802E+19 ± 0.63%	1.5130E+03
-150.00	1.0288E+16 ± 8.42%	2.9726E+16 ± 8.00%	3.6668E+16 ± 7.75%	1.3307E+19 ± 0.64%	1.3384E+19 ± 0.64%	1.2934E+03
-250.00	1.0151E+16 ± 13.34%	2.7104E+16 ± 8.30%	3.4411E+16 ± 8.37%	1.2608E+19 ± 0.66%	1.2680E+19 ± 0.66%	1.2420E+03
-375.00	6.8793E+15 ± 6.59%	2.1663E+16 ± 5.98%	2.9123E+16 ± 8.85%	1.1256E+19 ± 0.63%	1.1314E+19 ± 0.62%	1.6362E+03
-525.00	5.0328E+15 ± 7.92%	1.5457E+16 ± 7.62%	1.8472E+16 ± 11.14%	9.5109E+18 ± 0.67%	9.5499E+18 ± 0.67%	1.8898E+03
-675.00	2.7679E+15 ± 9.22%	1.1025E+16 ± 10.27%	1.1975E+16 ± 10.27%	7.7528E+18 ± 0.73%	7.7786E+18 ± 0.73%	2.8010E+03
-825.00	1.7890E+15 ± 10.77%	7.8853E+15 ± 13.38%	7.8352E+15 ± 9.97%	6.0725E+18 ± 0.81%	6.0900E+18 ± 0.80%	3.3943E+03
-1000.00	1.9069E+15 ± 8.88%	5.3885E+15 ± 8.16%	5.0751E+15 ± 7.90%	4.5338E+18 ± 0.87%	4.5461E+18 ± 0.87%	2.3775E+03
-1200.00	1.8894E+15 ± 9.00%	5.5251E+15 ± 8.04%	4.4453E+15 ± 6.87%	2.8132E+18 ± 1.01%	2.8250E+18 ± 1.01%	1.4889E+03
-1475.00	1.3984E+15 ± 10.19%	3.1175E+15 ± 7.05%	2.9310E+15 ± 14.41%	1.4038E+18 ± 1.34%	1.4113E+18 ± 1.34%	1.0039E+03
-1721.75	3.5852E+14 ± 21.10%	8.2539E+14 ± 15.69%	7.0128E+14 ± 17.21%	4.8839E+17 ± 2.23%	4.9028E+17 ± 2.22%	1.3622E+03

Table D-74. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Through Tube HB-5/HB-10 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1721.75	1.6542E+14 ± 19.67%	5.2095E+14 ± 18.57%	4.3915E+14 ± 16.23%	4.4746E+17 ± 2.43%	4.4859E+17 ± 2.42%	2.7050E+03
1475.00	1.4593E+15 ± 9.18%	2.9130E+15 ± 6.74%	2.1850E+15 ± 8.23%	1.3921E+18 ± 1.44%	1.3986E+18 ± 1.43%	9.5397E+02
1225.00	1.7822E+15 ± 8.90%	4.7161E+15 ± 6.51%	3.6098E+15 ± 7.06%	2.9151E+18 ± 1.09%	2.9252E+18 ± 1.09%	1.6357E+03
1000.00	1.5775E+15 ± 9.37%	5.1333E+15 ± 7.48%	4.3346E+15 ± 7.75%	4.5142E+18 ± 0.94%	4.5252E+18 ± 0.94%	2.8615E+03
825.00	1.3361E+15 ± 11.51%	5.1422E+15 ± 7.44%	5.8638E+15 ± 9.74%	6.3080E+18 ± 0.88%	6.3203E+18 ± 0.88%	4.7212E+03
675.00	1.8665E+15 ± 11.01%	8.4042E+15 ± 8.81%	9.2375E+15 ± 9.40%	8.0120E+18 ± 0.78%	8.0315E+18 ± 0.78%	4.2925E+03
525.00	7.5478E+15 ± 23.78%	1.3720E+16 ± 12.19%	1.4023E+16 ± 10.02%	9.8382E+18 ± 0.72%	9.8735E+18 ± 0.72%	1.3034E+03
375.00	7.0024E+15 ± 8.51%	2.3932E+16 ± 8.34%	2.7258E+16 ± 9.25%	1.1604E+19 ± 0.67%	1.1662E+19 ± 0.66%	1.6572E+03
250.00	1.1568E+16 ± 16.73%	2.8806E+16 ± 9.74%	3.3379E+16 ± 9.86%	1.2988E+19 ± 0.70%	1.3061E+19 ± 0.69%	1.1227E+03
150.00	1.0153E+16 ± 9.59%	3.4733E+16 ± 7.22%	3.4403E+16 ± 7.62%	1.3813E+19 ± 0.69%	1.3893E+19 ± 0.69%	1.3605E+03
50.00	1.0733E+16 ± 9.07%	3.4202E+16 ± 6.00%	4.9593E+16 ± 10.19%	1.4053E+19 ± 0.68%	1.4148E+19 ± 0.68%	1.3094E+03
-50.00	9.7542E+15 ± 9.38%	3.5830E+16 ± 6.47%	5.0647E+16 ± 9.24%	1.4096E+19 ± 0.68%	1.4192E+19 ± 0.67%	1.4451E+03
-150.00	1.1493E+16 ± 13.56%	3.0448E+16 ± 6.94%	3.3261E+16 ± 8.32%	1.3636E+19 ± 0.69%	1.3711E+19 ± 0.68%	1.1865E+03
-250.00	1.0028E+16 ± 10.00%	2.8857E+16 ± 7.63%	3.1653E+16 ± 8.62%	1.2928E+19 ± 0.71%	1.2999E+19 ± 0.70%	1.2892E+03
-375.00	7.6119E+15 ± 7.11%	2.2005E+16 ± 7.58%	2.5879E+16 ± 7.50%	1.1532E+19 ± 0.67%	1.1587E+19 ± 0.66%	1.5150E+03
-525.00	5.1872E+15 ± 8.81%	1.6425E+16 ± 8.94%	1.9173E+16 ± 9.00%	9.7542E+18 ± 0.72%	9.7950E+18 ± 0.72%	1.8805E+03
-675.00	2.7644E+15 ± 10.98%	1.0759E+16 ± 8.91%	1.1311E+16 ± 12.22%	7.8604E+18 ± 0.77%	7.8853E+18 ± 0.77%	2.8435E+03
-825.00	1.6377E+15 ± 10.89%	7.1556E+15 ± 15.82%	7.9278E+15 ± 12.33%	6.1093E+18 ± 0.85%	6.1260E+18 ± 0.85%	3.7304E+03
-1000.00	1.7975E+15 ± 9.67%	5.0047E+15 ± 6.79%	5.1669E+15 ± 12.84%	4.5422E+18 ± 0.92%	4.5542E+18 ± 0.92%	2.5270E+03
-1200.00	2.0232E+15 ± 9.64%	5.2667E+15 ± 6.21%	4.2741E+15 ± 6.44%	2.9375E+18 ± 1.07%	2.9491E+18 ± 1.06%	1.4519E+03
-1475.00	1.5059E+15 ± 10.06%	3.1394E+15 ± 6.99%	2.3875E+15 ± 7.74%	1.4212E+18 ± 1.41%	1.4282E+18 ± 1.41%	9.4375E+02
-1721.75	2.0691E+14 ± 24.32%	7.1867E+14 ± 16.66%	7.1044E+14 ± 17.93%	4.4403E+17 ± 2.42%	4.4567E+17 ± 2.42%	2.1460E+03

Table D-75. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Large Slant Beam Tube Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-57.50	6.9396E+15 ± 12.51%	2.8377E+16 ± 10.57%	3.9418E+16 ± 9.12%	1.2842E+19 ± 0.78%	1.2916E+19 ± 0.78%	1.8505E+03
50.00	7.9777E+15 ± 11.50%	2.4976E+16 ± 7.01%	4.1151E+16 ± 10.62%	1.2381E+19 ± 0.74%	1.2455E+19 ± 0.74%	1.5520E+03
175.00	7.9367E+15 ± 9.61%	2.5932E+16 ± 9.48%	3.3047E+16 ± 9.54%	1.1094E+19 ± 0.70%	1.1161E+19 ± 0.70%	1.3978E+03
325.00	8.1487E+15 ± 13.81%	1.9327E+16 ± 5.10%	2.2003E+16 ± 7.85%	9.3290E+18 ± 0.74%	9.3785E+18 ± 0.74%	1.1448E+03
500.00	5.5302E+15 ± 10.23%	1.3664E+16 ± 4.96%	1.4196E+16 ± 10.31%	7.2048E+18 ± 0.79%	7.2382E+18 ± 0.78%	1.3028E+03
700.00	2.3727E+15 ± 9.58%	8.4116E+15 ± 8.51%	8.0553E+15 ± 8.77%	4.9981E+18 ± 0.92%	5.0170E+18 ± 0.91%	2.1065E+03
900.00	1.2782E+15 ± 12.48%	4.4191E+15 ± 7.90%	3.9113E+15 ± 7.54%	3.3723E+18 ± 1.09%	3.3819E+18 ± 1.09%	2.6383E+03
1125.00	1.0769E+15 ± 12.82%	3.4501E+15 ± 7.58%	2.9476E+15 ± 11.16%	2.2154E+18 ± 1.26%	2.2229E+18 ± 1.25%	2.0572E+03
1375.00	7.9640E+14 ± 13.60%	2.2570E+15 ± 9.05%	1.8868E+15 ± 8.75%	1.2888E+18 ± 1.57%	1.2938E+18 ± 1.56%	1.6183E+03
1675.00	4.9425E+14 ± 16.60%	1.3712E+15 ± 9.77%	1.0302E+15 ± 10.64%	6.1060E+17 ± 1.93%	6.1350E+17 ± 1.92%	1.2354E+03

Table D-76. Four-group Neutron Spectrum (m^2s^{-1}) in the Large Slant Beam Tube Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-52.50	7.8493E+15 ± 11.86%	3.0925E+16 ± 8.68%	4.5125E+16 ± 8.68%	1.3074E+19 ± 0.74%	1.3158E+19 ± 0.74%	1.6656E+03
50.00	1.0867E+16 ± 19.27%	2.4242E+16 ± 5.81%	3.7898E+16 ± 8.86%	1.2591E+19 ± 0.75%	1.2664E+19 ± 0.75%	1.1586E+03
175.00	8.6283E+15 ± 10.27%	2.8474E+16 ± 8.63%	3.0618E+16 ± 8.39%	1.1349E+19 ± 0.70%	1.1417E+19 ± 0.70%	1.3153E+03
325.00	6.9687E+15 ± 9.16%	2.0363E+16 ± 4.73%	2.1769E+16 ± 7.29%	9.5142E+18 ± 0.75%	9.5633E+18 ± 0.75%	1.3653E+03
500.00	4.7310E+15 ± 5.92%	1.4487E+16 ± 4.70%	1.2972E+16 ± 6.26%	7.2548E+18 ± 0.80%	7.2869E+18 ± 0.79%	1.5334E+03
700.00	1.9741E+15 ± 8.09%	7.2804E+15 ± 5.56%	7.5784E+15 ± 7.04%	4.9223E+18 ± 0.92%	4.9392E+18 ± 0.92%	2.4935E+03
900.00	1.2597E+15 ± 11.13%	4.0442E+15 ± 7.25%	3.6600E+15 ± 6.96%	3.3397E+18 ± 1.10%	3.3487E+18 ± 1.09%	2.6512E+03
1125.00	9.5930E+14 ± 11.85%	3.0055E+15 ± 7.31%	2.4802E+15 ± 12.14%	2.1553E+18 ± 1.25%	2.1617E+18 ± 1.25%	2.2467E+03
1375.00	7.9535E+14 ± 14.13%	2.1692E+15 ± 7.99%	1.9064E+15 ± 8.96%	1.2544E+18 ± 1.59%	1.2593E+18 ± 1.58%	1.5772E+03
1675.00	4.7434E+14 ± 14.43%	1.3701E+15 ± 9.04%	9.6409E+14 ± 9.66%	5.7399E+17 ± 1.92%	5.7680E+17 ± 1.91%	1.2101E+03

Table D-77. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-1 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
126.20	a	3.7029E+15 ± 29.07%	b	7.3657E+18 ± 2.84%	7.3776E+18 ± 2.83%	
251.20	b	6.0026E+15 ± 20.11%	5.1745E+15 ± 21.28%	6.8521E+18 ± 2.46%	6.8644E+18 ± 2.45%	
401.20	b	6.3392E+15 ± 20.12%	8.4590E+15 ± 17.17%	6.3205E+18 ± 2.53%	6.3372E+18 ± 2.53%	
569.10	5.1438E+15 ± 20.53%	1.2669E+16 ± 13.10%	8.7127E+15 ± 15.42%	6.2583E+18 ± 2.31%	6.2848E+18 ± 2.30%	1.2167E+03
769.10	4.5662E+15 ± 21.73%	1.4688E+16 ± 12.10%	1.0297E+16 ± 13.58%	6.1720E+18 ± 2.31%	6.2015E+18 ± 2.30%	1.3517E+03
1026.20	4.0923E+15 ± 17.85%	1.4622E+16 ± 10.25%	1.0621E+16 ± 11.31%	5.0736E+18 ± 2.24%	5.1029E+18 ± 2.23%	1.2398E+03
1326.20	2.3818E+15 ± 20.00%	5.9253E+15 ± 15.96%	3.7494E+15 ± 20.03%	3.1405E+18 ± 2.72%	3.1525E+18 ± 2.71%	1.3185E+03
1626.20	b	b	b	1.7132E+18 ± 3.50%	1.7166E+18 ± 3.49%	
2093.10	5.5671E+14 ± 28.20%	2.4662E+15 ± 18.24%	b	5.6007E+17 ± 3.94%	5.6445E+17 ± 3.91%	1.0060E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-78. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Hydraulic Tube HT-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1.80	a	b	b	7.2851E+18 $\pm$ 4.87%	7.2930E+18 $\pm$ 4.87%	
38.10	b	1.9038E+15 $\pm$ 29.58%	3.7175E+15 $\pm$ 21.85%	7.7643E+18 $\pm$ 2.35%	7.7701E+18 $\pm$ 2.35%	
126.20	b	5.4439E+15 $\pm$ 19.95%	6.0126E+15 $\pm$ 20.58%	7.2635E+18 $\pm$ 2.11%	7.2755E+18 $\pm$ 2.10%	
251.20	b	8.0740E+15 $\pm$ 12.86%	6.9789E+15 $\pm$ 14.77%	7.0213E+18 $\pm$ 1.88%	7.0374E+18 $\pm$ 1.88%	
401.20	b	6.3760E+15 $\pm$ 13.32%	8.3563E+15 $\pm$ 12.98%	6.6124E+18 $\pm$ 1.92%	6.6290E+18 $\pm$ 1.91%	
569.10	5.1175E+15 $\pm$ 13.90%	1.0777E+16 $\pm$ 9.33%	8.3358E+15 $\pm$ 11.06%	6.6292E+18 $\pm$ 1.82%	6.6534E+18 $\pm$ 1.82%	1.2954E+03
769.10	5.5852E+15 $\pm$ 11.43%	1.4311E+16 $\pm$ 7.96%	9.1674E+15 $\pm$ 9.67%	6.3170E+18 $\pm$ 1.78%	6.3461E+18 $\pm$ 1.77%	1.1310E+03
1026.20	5.1181E+15 $\pm$ 12.12%	1.2595E+16 $\pm$ 7.14%	1.0126E+16 $\pm$ 10.05%	5.1830E+18 $\pm$ 1.75%	5.2108E+18 $\pm$ 1.74%	1.0127E+03
1326.20	2.3875E+15 $\pm$ 16.27%	5.9329E+15 $\pm$ 14.21%	4.0989E+15 $\pm$ 12.10%	3.1655E+18 $\pm$ 2.13%	3.1780E+18 $\pm$ 2.13%	1.3259E+03
1626.20	1.0825E+15 $\pm$ 22.83%	2.1089E+15 $\pm$ 16.87%	1.4491E+15 $\pm$ 23.10%	1.7276E+18 $\pm$ 2.76%	1.7322E+18 $\pm$ 2.76%	1.5959E+03
2093.10	6.2910E+14 $\pm$ 18.05%	1.9470E+15 $\pm$ 12.77%	1.5579E+15 $\pm$ 19.38%	5.6904E+17 $\pm$ 3.20%	5.7318E+17 $\pm$ 3.18%	9.0453E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-79. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Hydraulic Tube HT-1 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
126.20	a	b	b	6.7142E+18 $\pm$ 3.64%	6.7291E+18 $\pm$ 3.63%	
251.20	b	6.9959E+15 $\pm$ 26.04%	5.0457E+15 $\pm$ 29.63%	6.4349E+18 $\pm$ 3.14%	6.4485E+18 $\pm$ 3.13%	
401.20	b	4.6025E+15 $\pm$ 29.72%	7.9939E+15 $\pm$ 26.56%	5.9849E+18 $\pm$ 3.12%	5.9990E+18 $\pm$ 3.12%	
569.10	b	1.3337E+16 $\pm$ 21.16%	8.9166E+15 $\pm$ 20.07%	6.0636E+18 $\pm$ 2.86%	6.0874E+18 $\pm$ 2.85%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-80. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Hydraulic Tube HT-2 Lower Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1125.00	b	2.8787E+15 ± 24.78%	2.2125E+15 ± 21.44%	4.2041E+17 ± 5.28%	4.2596E+17 ± 5.21%	
775.00	b	b	3.0515E+15 ± 29.29%	1.1077E+18 ± 4.72%	1.1134E+18 ± 4.70%	
525.00	b	1.5687E+15 ± 27.22%	b	1.5334E+18 ± 3.80%	1.5376E+18 ± 3.79%	
300.00	b	3.7502E+15 ± 22.59%	2.7129E+15 ± 27.51%	2.1242E+18 ± 4.02%	2.1308E+18 ± 4.01%	
100.00	b	b	b	2.9584E+18 ± 3.39%	3.0102E+18 ± 3.35%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-81. Four-group Neutron Spectrum ($m^{-2}s^{-1}$) in the Hydraulic Tube HT-2 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1.80	2.3325E+18 ± 9.63%	9.9215E+18 ± 4.66%	9.3476E+18 ± 4.76%	5.0577E+19 ± 2.04%	7.2178E+19 ± 1.73%	2.1684E+01
36.90	2.7521E+18 ± 3.71%	1.1466E+19 ± 1.89%	9.9604E+18 ± 1.98%	4.9340E+19 ± 0.99%	7.3518E+19 ± 0.83%	1.7928E+01
116.70	4.7832E+18 ± 2.61%	1.4950E+19 ± 1.53%	1.0408E+19 ± 1.79%	4.2376E+19 ± 1.01%	7.2517E+19 ± 0.77%	8.8594E+00
184.60	6.5412E+18 ± 2.75%	1.8280E+19 ± 1.73%	1.1136E+19 ± 2.17%	3.9033E+19 ± 1.25%	7.4990E+19 ± 0.91%	5.9673E+00
234.60	6.8369E+18 ± 2.62%	1.9236E+19 ± 1.66%	1.1551E+19 ± 2.12%	3.8511E+19 ± 1.26%	7.6135E+19 ± 0.90%	5.6328E+00
309.60	6.5233E+18 ± 2.03%	1.9139E+19 ± 1.28%	1.1075E+19 ± 1.61%	3.8270E+19 ± 1.01%	7.5007E+19 ± 0.72%	5.8667E+00
409.60	6.0368E+18 ± 2.20%	1.6860E+19 ± 1.37%	1.0421E+19 ± 1.72%	3.6025E+19 ± 1.05%	6.9343E+19 ± 0.76%	5.9675E+00
509.60	4.8860E+18 ± 2.42%	1.3447E+19 ± 1.53%	7.8024E+18 ± 1.92%	3.0726E+19 ± 1.13%	5.6861E+19 ± 0.83%	6.2885E+00
609.60	2.9348E+18 ± 3.18%	8.2101E+18 ± 1.96%	5.7295E+18 ± 2.32%	2.7246E+19 ± 1.20%	4.4120E+19 ± 0.95%	9.2838E+00
831.90	2.9242E+17 ± 5.65%	1.2375E+18 ± 2.80%	1.2463E+18 ± 2.71%	1.4664E+19 ± 1.03%	1.7440E+19 ± 0.94%	5.0147E+01

Table D-82. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
113.10	4.5508E+18 ± 5.53%	1.4811E+19 ± 3.15%	1.0562E+19 ± 3.67%	3.9971E+19 ± 1.77%	6.9995E+19 ± 1.41%	8.5944E+00
181.00	6.0083E+18 ± 6.04%	1.8389E+19 ± 3.60%	1.0363E+19 ± 4.62%	3.7448E+19 ± 2.33%	7.2208E+19 ± 1.75%	6.2328E+00
231.00	7.6794E+18 ± 5.54%	2.0311E+19 ± 3.54%	1.1168E+19 ± 4.41%	3.5628E+19 ± 2.39%	7.4785E+19 ± 1.75%	4.6394E+00
306.00	6.6598E+18 ± 4.31%	1.9240E+19 ± 2.62%	1.1290E+19 ± 3.27%	3.4691E+19 ± 1.82%	7.1882E+19 ± 1.32%	5.2090E+00
406.00	6.3568E+18 ± 4.46%	1.7266E+19 ± 2.78%	1.0392E+19 ± 3.44%	3.4230E+19 ± 1.84%	6.8245E+19 ± 1.37%	5.3848E+00
506.00	4.3778E+18 ± 5.47%	1.3692E+19 ± 3.05%	8.2710E+18 ± 3.85%	2.8424E+19 ± 1.97%	5.4765E+19 ± 1.51%	6.4928E+00
606.00	3.0122E+18 ± 6.38%	8.3571E+18 ± 3.85%	5.8818E+18 ± 4.42%	2.5608E+19 ± 2.10%	4.2859E+19 ± 1.69%	8.5014E+00

Table D-83. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Upper Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
42.90	4.5630E+18 ± 4.04%	1.4931E+19 ± 2.29%	1.0682E+19 ± 2.66%	4.1252E+19 ± 1.40%	7.1428E+19 ± 1.08%	9.0406E+00
110.80	6.2029E+18 ± 4.35%	1.7858E+19 ± 2.53%	1.0699E+19 ± 3.26%	3.6897E+19 ± 1.81%	7.1656E+19 ± 1.31%	5.9483E+00
160.80	7.3522E+18 ± 4.11%	1.9711E+19 ± 2.47%	1.1466E+19 ± 3.24%	3.7506E+19 ± 1.81%	7.6036E+19 ± 1.29%	5.1013E+00
235.80	6.6971E+18 ± 3.13%	1.9488E+19 ± 1.92%	1.1370E+19 ± 2.43%	3.7260E+19 ± 1.40%	7.4816E+19 ± 1.01%	5.5637E+00
335.80	5.9918E+18 ± 3.29%	1.7254E+19 ± 2.01%	1.0031E+19 ± 2.63%	3.5681E+19 ± 1.45%	6.8957E+19 ± 1.06%	5.9550E+00
435.80	4.8057E+18 ± 3.68%	1.3750E+19 ± 2.26%	8.3414E+18 ± 2.80%	3.0456E+19 ± 1.56%	5.7353E+19 ± 1.15%	6.3374E+00
535.80	2.6003E+18 ± 4.87%	8.2013E+18 ± 2.88%	5.6371E+18 ± 3.37%	2.6917E+19 ± 1.67%	4.3356E+19 ± 1.33%	1.0351E+01
795.00	2.8426E+17 ± 8.99%	1.2044E+18 ± 4.22%	1.2816E+18 ± 3.92%	1.4699E+19 ± 1.32%	1.7470E+19 ± 1.21%	5.1710E+01

Table D-84. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Upper Outer Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Thermal/Fast Ratio	
	Total		Total		Total		Total		Total	
1125.00	6.311E+14	± 24.07%	2.228E+15	± 13.78%	2.0410E+15	± 15.52%	4.2694E+17	± 4.44%	4.3184E+17	± 4.39%
775.00	7.3718E+14	± 29.56%	2.2738E+15	± 21.08%	1.7992E+15	± 20.86%	1.1196E+18	± 3.73%	1.1244E+18	± 3.71%
525.00	6.6080E+14	± 25.22%	1.8749E+15	± 18.97%	1.1668E+15	± 20.86%	1.4939E+18	± 3.19%	1.4976E+18	± 3.18%
300.00	b		3.5515E+15	± 17.97%	2.2954E+15	± 17.17%	2.1165E+18	± 3.08%	2.1230E+18	± 3.07%
100.00	b		1.7982E+16	± 20.83%	2.5835E+16	± 17.33%	2.9301E+18	± 2.58%	2.9768E+18	± 2.55%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-85. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 Flight Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Thermal/Fast Ratio	
	Total		Total		Total		Total		Total	
126.20	b		5.5343E+15	± 27.36%	b		7.8008E+18	± 2.79%	7.8092E+18	± 2.79%
251.20	b		6.2748E+15	± 19.01%	6.5109E+15	± 17.10%	6.9514E+18	± 2.35%	6.9655E+18	± 2.35%
401.20	b		7.9212E+15	± 18.83%	6.5691E+15	± 22.90%	7.1473E+18	± 2.34%	7.1621E+18	± 2.34%
569.10	5.1229E+15	± 21.38%	1.5061E+16	± 17.75%	8.7715E+15	± 16.31%	7.2652E+18	± 2.19%	7.2942E+18	± 2.19%
769.10	5.7903E+15	± 18.52%	1.1820E+16	± 11.72%	1.0022E+16	± 13.93%	7.0341E+18	± 2.14%	7.0618E+18	± 2.13%
1026.20	4.2593E+15	± 20.54%	1.4703E+16	± 10.50%	9.9916E+15	± 12.02%	5.9913E+18	± 2.07%	6.0202E+18	± 2.06%
1326.20	1.9060E+15	± 26.61%	4.5600E+15	± 18.14%	3.9779E+15	± 18.24%	3.8978E+18	± 2.50%	3.9083E+18	± 2.50%
1626.20	b		1.5077E+15	± 27.37%	1.5131E+15	± 27.54%	2.0056E+18	± 3.34%	2.0096E+18	± 3.34%
2093.10	b		1.2926E+15	± 26.34%	1.1668E+15	± 21.94%	6.2161E+17	± 3.76%	6.2460E+17	± 3.74%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-86. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1.80	a	b	b	7.2626E+18 $\pm$ 4.49%	7.2688E+18 $\pm$ 4.49%	
38.10	b	b	3.6241E+15 $\pm$ 29.87%	7.7333E+18 $\pm$ 2.28%	7.7392E+18 $\pm$ 2.28%	
126.20	b	b	5.2293E+15 $\pm$ 23.90%	7.6662E+18 $\pm$ 2.03%	7.6820E+18 $\pm$ 2.03%	
251.20	b	9.3903E+15 $\pm$ 26.41%	7.0052E+15 $\pm$ 13.67%	7.3658E+18 $\pm$ 1.78%	7.3830E+18 $\pm$ 1.78%	
401.20	b	7.7047E+15 $\pm$ 12.77%	7.1700E+15 $\pm$ 12.35%	7.5685E+18 $\pm$ 1.79%	7.5846E+18 $\pm$ 1.79%	
569.10	4.9189E+15 $\pm$ 13.51%	1.2431E+16 $\pm$ 11.69%	9.2486E+15 $\pm$ 21.66%	7.2279E+18 $\pm$ 1.68%	7.2545E+18 $\pm$ 1.68%	1.4694E+03
769.10	4.7144E+15 $\pm$ 12.47%	1.3521E+16 $\pm$ 8.16%	1.1653E+16 $\pm$ 17.12%	7.1353E+18 $\pm$ 1.66%	7.1652E+18 $\pm$ 1.66%	1.5135E+03
1026.20	4.5393E+15 $\pm$ 10.10%	1.3110E+16 $\pm$ 7.84%	9.2233E+15 $\pm$ 8.93%	5.9683E+18 $\pm$ 1.66%	5.9952E+18 $\pm$ 1.65%	1.3148E+03
1326.20	2.0242E+15 $\pm$ 17.66%	5.2091E+15 $\pm$ 12.67%	4.1542E+15 $\pm$ 13.02%	3.8011E+18 $\pm$ 2.03%	3.8125E+18 $\pm$ 2.03%	1.8778E+03
1626.20	7.2673E+14 $\pm$ 25.27%	1.8678E+15 $\pm$ 18.10%	1.8369E+15 $\pm$ 20.23%	2.0113E+18 $\pm$ 2.66%	2.0157E+18 $\pm$ 2.65%	2.7676E+03
2093.10	5.5424E+14 $\pm$ 20.95%	1.5725E+15 $\pm$ 15.69%	1.4622E+15 $\pm$ 16.97%	6.1075E+17 $\pm$ 3.12%	6.1434E+17 $\pm$ 3.10%	1.1020E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-87. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
126.20	a	b	b	6.8220E+18 $\pm$ 3.43%	6.8309E+18 $\pm$ 3.43%	
251.20	b	6.2802E+15 $\pm$ 29.63%	6.4811E+15 $\pm$ 27.31%	7.0174E+18 $\pm$ 2.90%	7.0321E+18 $\pm$ 2.90%	
401.20	a	6.0929E+15 $\pm$ 24.77%	7.7261E+15 $\pm$ 24.83%	7.0136E+18 $\pm$ 2.95%	7.0278E+18 $\pm$ 2.94%	
569.10	3.4966E+15 $\pm$ 29.27%	b	8.6693E+15 $\pm$ 20.55%	6.6090E+18 $\pm$ 2.77%	6.6393E+18 $\pm$ 2.76%	1.8901E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-88. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Lower Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
126.20	6.5352E+17 ±	9.52%	3.1640E+18 ±	4.68%	4.4115E+18 ±	3.83%	5.4661E+19 ±	1.17%	6.2890E+19 ±	1.10%	8.3641E+01
251.20	6.5643E+17 ±	7.68%	3.6502E+18 ±	3.61%	4.7187E+18 ±	3.03%	5.2888E+19 ±	1.01%	6.1913E+19 ±	0.93%	8.0569E+01
401.20	1.2464E+18 ±	5.64%	5.5188E+18 ±	2.90%	5.8514E+18 ±	2.87%	4.7783E+19 ±	1.06%	6.0400E+19 ±	0.95%	3.8337E+01
526.20	1.5749E+18 ±	5.99%	6.9972E+18 ±	3.02%	6.1863E+18 ±	3.09%	4.5197E+19 ±	1.29%	5.9955E+19 ±	1.11%	2.8698E+01
619.10	1.4611E+18 ±	7.10%	6.8327E+18 ±	3.35%	6.1298E+18 ±	3.41%	4.2842E+19 ±	1.40%	5.7266E+19 ±	1.22%	2.9321E+01
712.00	1.3584E+18 ±	7.10%	6.1735E+18 ±	3.37%	5.9458E+18 ±	3.42%	4.1841E+19 ±	1.37%	5.5318E+19 ±	1.21%	3.0801E+01
812.00	8.4083E+17 ±	7.75%	3.9153E+18 ±	3.96%	4.5377E+18 ±	3.90%	3.5608E+19 ±	1.48%	4.4902E+19 ±	1.31%	4.2348E+01
912.00	6.5314E+17 ±	9.91%	2.4531E+18 ±	5.14%	2.9348E+18 ±	4.79%	2.9803E+19 ±	1.60%	3.5844E+19 ±	1.46%	4.5631E+01
1188.55	4.6582E+16 ±	16.58%	2.7174E+17 ±	7.21%	3.1814E+17 ±	6.16%	9.6925E+18 ±	1.38%	1.0329E+19 ±	1.34%	2.0807E+02

Table D-89. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
1.80	7.0904E+17 ±	19.68%	2.8143E+18 ±	9.24%	3.4396E+18 ±	7.26%	5.3737E+19 ±	2.04%	6.0700E+19 ±	1.92%	7.5789E+01
38.10	5.3978E+17 ±	7.56%	2.9150E+18 ±	3.61%	4.1060E+18 ±	3.04%	5.5330E+19 ±	0.96%	6.2891E+19 ±	0.90%	1.0250E+02
126.20	6.4494E+17 ±	6.54%	3.3081E+18 ±	3.10%	4.4624E+18 ±	2.58%	5.5755E+19 ±	0.87%	6.4171E+19 ±	0.81%	8.6450E+01
251.20	6.8443E+17 ±	5.16%	3.6220E+18 ±	2.44%	4.7650E+18 ±	2.13%	5.4251E+19 ±	0.77%	6.3323E+19 ±	0.71%	7.9265E+01
401.20	1.1912E+18 ±	3.83%	5.4813E+18 ±	1.99%	5.7738E+18 ±	1.92%	4.9029E+19 ±	0.80%	6.1475E+19 ±	0.72%	4.1161E+01
526.20	1.6440E+18 ±	4.07%	6.9915E+18 ±	2.10%	6.5777E+18 ±	2.16%	4.5566E+19 ±	0.95%	6.0779E+19 ±	0.83%	2.7716E+01
619.10	1.4974E+18 ±	4.56%	6.6480E+18 ±	2.26%	6.4162E+18 ±	2.28%	4.4447E+19 ±	1.03%	5.9009E+19 ±	0.88%	2.9682E+01
712.00	1.3197E+18 ±	4.82%	5.9189E+18 ±	2.28%	5.7413E+18 ±	2.30%	4.1631E+19 ±	1.02%	5.4610E+19 ±	0.88%	3.1544E+01
812.00	9.9579E+17 ±	5.13%	4.2940E+18 ±	2.68%	4.3562E+18 ±	2.62%	3.5378E+19 ±	1.10%	4.5024E+19 ±	0.97%	3.5528E+01
912.00	6.1799E+17 ±	6.82%	2.5146E+18 ±	3.47%	2.8655E+18 ±	3.33%	2.9384E+19 ±	1.21%	3.5382E+19 ±	1.10%	4.7549E+01
1188.55	5.8897E+16 ±	9.47%	3.0238E+17 ±	4.72%	4.0091E+17 ±	4.17%	1.0183E+19 ±	1.05%	1.0945E+19 ±	1.02%	1.7289E+02

Table D-90. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
569.10	1.4252E+18 $\pm$ 6.66%	6.9880E+18 $\pm$ 3.15%	6.6030E+18 $\pm$ 3.28%	4.1919E+19 $\pm$ 1.26%	5.6935E+19 $\pm$ 1.10%	2.9413E+01
401.20	1.2557E+18 $\pm$ 7.37%	5.4037E+18 $\pm$ 3.95%	5.8076E+18 $\pm$ 3.74%	4.5118E+19 $\pm$ 1.32%	5.7585E+19 $\pm$ 1.19%	3.5931E+01
251.20	7.1732E+17 $\pm$ 9.55%	3.8697E+18 $\pm$ 4.78%	4.8241E+18 $\pm$ 4.13%	4.9802E+19 $\pm$ 1.25%	5.9213E+19 $\pm$ 1.17%	6.9428E+01
126.20	7.3214E+17 $\pm$ 12.62%	3.4284E+18 $\pm$ 6.30%	4.1616E+18 $\pm$ 5.41%	5.2411E+19 $\pm$ 1.47%	6.0733E+19 $\pm$ 1.39%	7.1586E+01

Table D-91. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Upper Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	2.1203E+15 $\pm$ 27.61%	3.0663E+15 $\pm$ 21.86%	1.7353E+18 $\pm$ 4.39%	1.7415E+18 $\pm$ 4.37%	
300.00	b	1.4944E+15 $\pm$ 27.36%	b	1.4212E+18 $\pm$ 4.62%	1.4256E+18 $\pm$ 4.61%	
525.00	b	1.8388E+15 $\pm$ 27.14%	b	9.7317E+17 $\pm$ 4.79%	9.7607E+17 $\pm$ 4.78%	
775.00	b	b	1.9345E+15 $\pm$ 29.39%	5.3038E+17 $\pm$ 5.39%	5.3464E+17 $\pm$ 5.35%	
1035.00	b	b	b	2.4506E+17 $\pm$ 8.78%	2.4780E+17 $\pm$ 8.69%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-92. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	3.4683E+15 $\pm$ 17.50%	1.6340E+18 $\pm$ 3.39%	1.6465E+18 $\pm$ 3.39%	
300.00	9.6079E+14 $\pm$ 29.15%	2.1354E+15 $\pm$ 18.67%	1.9229E+15 $\pm$ 21.96%	1.3803E+18 $\pm$ 3.59%	1.3853E+18 $\pm$ 3.57%	1.4366E+03
525.00	b	2.7204E+15 $\pm$ 18.50%	8.5633E+14 $\pm$ 27.25%	1.0030E+18 $\pm$ 3.69%	1.0071E+18 $\pm$ 3.68%	
775.00	b	1.9656E+15 $\pm$ 19.87%	9.8930E+14 $\pm$ 22.11%	5.7908E+17 $\pm$ 4.63%	5.8293E+17 $\pm$ 4.60%	
1035.00	5.0788E+14 $\pm$ 29.70%	1.3816E+15 $\pm$ 22.87%	5.9102E+14 $\pm$ 27.70%	2.5254E+17 $\pm$ 6.96%	2.5502E+17 $\pm$ 6.90%	4.9723E+02

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-93. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Lower Inner Tube. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
7.40	2.4799E+18 $\pm$ 7.49%	9.4580E+18 $\pm$ 3.65%	8.5181E+18 $\pm$ 4.16%	4.0552E+19 $\pm$ 1.81%	6.1008E+19 $\pm$ 1.51%	1.6352E+01
44.70	3.1813E+18 $\pm$ 3.11%	1.1027E+19 $\pm$ 1.82%	8.6633E+18 $\pm$ 2.03%	3.4182E+19 $\pm$ 1.00%	5.7054E+19 $\pm$ 0.81%	1.0745E+01
106.20	4.3563E+18 $\pm$ 3.14%	1.3200E+19 $\pm$ 1.92%	8.7301E+18 $\pm$ 2.22%	2.9085E+19 $\pm$ 1.23%	5.5372E+19 $\pm$ 0.94%	6.6766E+00
181.20	4.7487E+18 $\pm$ 2.23%	1.4378E+19 $\pm$ 1.40%	9.4263E+18 $\pm$ 1.68%	2.6136E+19 $\pm$ 0.99%	5.4689E+19 $\pm$ 0.73%	5.5038E+00
281.20	4.7039E+18 $\pm$ 2.26%	1.4053E+19 $\pm$ 1.44%	8.5939E+18 $\pm$ 1.72%	2.5860E+19 $\pm$ 1.01%	5.3211E+19 $\pm$ 0.75%	5.4976E+00
366.13	4.0834E+18 $\pm$ 2.66%	1.2208E+19 $\pm$ 1.68%	7.6444E+18 $\pm$ 2.05%	2.8893E+19 $\pm$ 1.12%	5.2829E+19 $\pm$ 0.84%	7.0756E+00
441.13	3.5862E+18 $\pm$ 2.58%	1.0272E+19 $\pm$ 1.64%	6.5791E+18 $\pm$ 2.01%	2.7707E+19 $\pm$ 1.06%	4.8145E+19 $\pm$ 0.82%	7.7259E+00
556.20	2.1090E+18 $\pm$ 2.76%	6.3248E+18 $\pm$ 1.62%	4.4372E+18 $\pm$ 1.92%	2.4080E+19 $\pm$ 0.95%	3.6951E+19 $\pm$ 0.77%	1.1418E+01
715.58	5.5898E+17 $\pm$ 6.45%	2.3687E+18 $\pm$ 3.34%	2.1678E+18 $\pm$ 3.36%	1.9030E+19 $\pm$ 1.24%	2.4125E+19 $\pm$ 1.11%	3.4043E+01

Table D-94. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Lower Outer Tube. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1.75	2.0297E+18 $\pm$ 4.54%	9.0722E+18 $\pm$ 2.59%	7.9406E+18 $\pm$ 2.65%	4.2992E+19 $\pm$ 1.22%	6.2034E+19 $\pm$ 1.02%	2.1182E+01
42.35	3.0790E+18 $\pm$ 2.43%	1.0979E+19 $\pm$ 1.38%	8.4766E+18 $\pm$ 1.51%	3.8161E+19 $\pm$ 0.81%	6.0696E+19 $\pm$ 0.65%	1.2394E+01
106.20	4.4420E+18 $\pm$ 2.41%	1.3161E+19 $\pm$ 1.48%	8.9086E+18 $\pm$ 1.74%	3.1636E+19 $\pm$ 0.98%	5.8148E+19 $\pm$ 0.75%	7.1222E+00
181.20	4.9533E+18 $\pm$ 1.75%	1.4355E+19 $\pm$ 1.11%	9.1331E+18 $\pm$ 1.32%	2.8849E+19 $\pm$ 0.83%	5.7270E+19 $\pm$ 0.61%	5.8477E+00
281.20	4.6468E+18 $\pm$ 1.78%	1.3913E+19 $\pm$ 1.10%	8.9554E+18 $\pm$ 1.37%	2.8245E+19 $\pm$ 0.85%	5.5760E+19 $\pm$ 0.62%	6.0783E+00
366.13	4.3215E+18 $\pm$ 2.16%	1.2353E+19 $\pm$ 1.36%	7.8156E+18 $\pm$ 1.64%	2.9383E+19 $\pm$ 0.97%	5.3873E+19 $\pm$ 0.72%	6.7992E+00
441.13	3.5804E+18 $\pm$ 2.20%	1.0354E+19 $\pm$ 1.40%	6.6112E+18 $\pm$ 1.69%	2.8075E+19 $\pm$ 0.95%	4.8621E+19 $\pm$ 0.73%	7.8408E+00
556.20	2.0745E+18 $\pm$ 2.27%	6.2950E+18 $\pm$ 1.40%	4.3746E+18 $\pm$ 1.64%	2.4339E+19 $\pm$ 0.86%	3.7082E+19 $\pm$ 0.70%	1.1732E+01
715.58	5.0373E+17 $\pm$ 5.42%	2.2608E+18 $\pm$ 2.93%	2.1978E+18 $\pm$ 2.90%	1.9635E+19 $\pm$ 1.12%	2.4597E+19 $\pm$ 1.00%	3.8979E+01

Table D-95. Four-group Neutron Spectrum (m^2s^{-1}) in the slant tube SH-1 50% Al/50% SS-316 sample. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (100.0 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
44.70	3.236E+18 ± 3.14%	1.1070E+19 ± 1.87%	8.3199E+18 ± 2.05%	2.8871E+19 ± 0.95%	5.1494E+19 ± 0.80%	8.9314E+00
106.20	4.3725E+18 ± 3.20%	1.3048E+19 ± 1.94%	8.5579E+18 ± 2.29%	2.3670E+19 ± 1.17%	4.9648E+19 ± 0.94%	5.4133E+00
181.20	4.9583E+18 ± 2.24%	1.3686E+19 ± 1.47%	8.9461E+18 ± 1.76%	2.1998E+19 ± 0.95%	4.9588E+19 ± 0.75%	4.4366E+00
281.20	4.8339E+18 ± 2.30%	1.3310E+19 ± 1.48%	8.4435E+18 ± 1.81%	2.1703E+19 ± 0.96%	4.8290E+19 ± 0.75%	4.4897E+00

Table D-96. Four-group Neutron Spectrum (m^2s^{-1}) in the slant tube SH-1 Upper Inner Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (100.0 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1225.00	8.5163E+14 ± 18.61%	3.3261E+15 ± 29.33%	1.5519E+15 ± 11.94%	5.9817E+17 ± 2.99%	6.0390E+17 ± 2.97%	7.0238E+02
775.00	9.4323E+14 ± 26.57%	2.1489E+15 ± 20.57%	2.0924E+15 ± 17.18%	1.5981E+18 ± 2.73%	1.6033E+18 ± 2.72%	1.6943E+03
525.00	1.1190E+15 ± 26.07%	5.1287E+15 ± 26.77%	1.0623E+16 ± 25.73%	2.7872E+18 ± 2.19%	2.8040E+18 ± 2.18%	2.4908E+03
300.00	7.7468E+15 ± 26.02%	6.9744E+16 ± 17.89%	7.7193E+16 ± 14.29%	5.1270E+18 ± 1.75%	5.2817E+18 ± 1.75%	6.6182E+02
100.00	1.0081E+17 ± 9.84%	5.4522E+17 ± 5.06%	6.7093E+17 ± 4.47%	1.1454E+19 ± 1.20%	1.2771E+19 ± 1.15%	1.1362E+02

Table D-97. Four-group Neutron Spectrum (m^2s^{-1}) in the slant tube SH-1 Upper Outer Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (100.0 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1225.00	9.6770E+14 ± 15.86%	2.2262E+15 ± 10.27%	1.7122E+15 ± 10.13%	5.8315E+17 ± 2.73%	5.8806E+17 ± 2.71%	6.0262E+02
775.00	1.1583E+15 ± 22.49%	2.5658E+15 ± 13.30%	1.7158E+15 ± 15.35%	1.5864E+18 ± 2.57%	1.5919E+18 ± 2.57%	1.3697E+03
525.00	1.1346E+15 ± 23.92%	b	b	2.6752E+18 ± 2.03%	2.6937E+18 ± 2.03%	2.3580E+03
300.00	6.6271E+15 ± 23.11%	5.1771E+16 ± 13.20%	6.5416E+16 ± 11.72%	5.0381E+18 ± 1.65%	5.1619E+18 ± 1.62%	7.6023E+02
100.00	1.0384E+17 ± 10.18%	4.8046E+17 ± 4.33%	6.2175E+17 ± 3.82%	1.1376E+19 ± 1.11%	1.2583E+19 ± 1.05%	1.0955E+02

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-98. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 Lower Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
7.40	2.9010E+18 ±	7.18%	9.4689E+18 ±	3.68%	8.3676E+18 ±	3.91%	4.0080E+19 ±	1.77%	6.0817E+19 ±	1.47%	1.3816E+01
44.70	3.3071E+18 ±	3.09%	1.0862E+19 ±	1.85%	8.3558E+18 ±	2.03%	3.4846E+19 ±	1.01%	5.7371E+19 ±	0.82%	1.0537E+01
106.20	4.3135E+18 ±	3.16%	1.2793E+19 ±	1.88%	8.4340E+18 ±	2.27%	2.9257E+19 ±	1.22%	5.4797E+19 ±	0.93%	6.7827E+00
181.20	4.8133E+18 ±	2.25%	1.4214E+19 ±	1.38%	8.8216E+18 ±	1.68%	2.7025E+19 ±	0.99%	5.4874E+19 ±	0.73%	5.6147E+00
281.20	4.7329E+18 ±	2.30%	1.4154E+19 ±	1.41%	8.5507E+18 ±	1.77%	2.6272E+19 ±	1.02%	5.3709E+19 ±	0.75%	5.5510E+00
366.13	4.3031E+18 ±	2.66%	1.2765E+19 ±	1.62%	7.4967E+18 ±	1.98%	2.9103E+19 ±	1.11%	5.3668E+19 ±	0.83%	6.7632E+00
441.13	3.5648E+18 ±	2.67%	1.0511E+19 ±	1.65%	6.6913E+18 ±	1.99%	2.8362E+19 ±	1.05%	4.9129E+19 ±	0.82%	7.9561E+00
556.20	2.0339E+18 ±	2.71%	6.1958E+18 ±	1.64%	4.5598E+18 ±	1.92%	2.4045E+19 ±	0.95%	3.6835E+19 ±	0.78%	1.1822E+01
715.58	6.0690E+17 ±	6.81%	2.3510E+18 ±	3.22%	2.0917E+18 ±	3.28%	1.9452E+19 ±	1.25%	2.4502E+19 ±	1.12%	3.2052E+01

Table D-99. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
1.75	2.3124E+18 ±	4.92%	9.3351E+18 ±	2.58%	8.5221E+18 ±	2.60%	4.3523E+19 ±	1.23%	6.3693E+19 ±	1.02%	1.8822E+01
42.35	3.0159E+18 ±	2.43%	1.0765E+19 ±	1.38%	8.5199E+18 ±	1.53%	3.7977E+19 ±	0.81%	6.0278E+19 ±	0.65%	1.2592E+01
106.20	4.4094E+18 ±	2.45%	1.2974E+19 ±	1.47%	8.6836E+18 ±	1.74%	3.2627E+19 ±	0.97%	5.8694E+19 ±	0.75%	7.3994E+00
181.20	4.8695E+18 ±	1.75%	1.4625E+19 ±	1.10%	9.3201E+18 ±	1.33%	2.9960E+19 ±	0.82%	5.8775E+19 ±	0.60%	6.1527E+00
281.20	4.6592E+18 ±	1.78%	1.3995E+19 ±	1.11%	8.6854E+18 ±	1.35%	2.8285E+19 ±	0.84%	5.5624E+19 ±	0.62%	6.0707E+00
366.13	4.3254E+18 ±	2.15%	1.2783E+19 ±	1.33%	7.8553E+18 ±	1.64%	2.9972E+19 ±	0.96%	5.4936E+19 ±	0.72%	6.9293E+00
441.13	3.5154E+18 ±	2.20%	1.0639E+19 ±	1.39%	6.6195E+18 ±	1.69%	2.8471E+19 ±	0.94%	4.9246E+19 ±	0.72%	8.0991E+00
556.20	2.0493E+18 ±	2.36%	6.1602E+18 ±	1.40%	4.4962E+18 ±	1.63%	2.4030E+19 ±	0.86%	3.6736E+19 ±	0.70%	1.1726E+01
715.58	4.9513E+17 ±	5.48%	2.2447E+18 ±	2.86%	2.2085E+18 ±	2.93%	1.9208E+19 ±	1.13%	2.4156E+19 ±	1.01%	3.8793E+01

Table D-100. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-2 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
44.70	$3.4037\text{E}+18 \pm 3.04\%$	$1.0641\text{E}+19 \pm 1.90\%$	$8.3378\text{E}+18 \pm 2.06\%$	$2.9433\text{E}+19 \pm 0.94\%$	$5.1815\text{E}+19 \pm 0.80\%$	$8.6472\text{E}+00$
106.20	$4.3025\text{E}+18 \pm 3.10\%$	$1.2489\text{E}+19 \pm 1.97\%$	$8.5518\text{E}+18 \pm 2.32\%$	$2.4155\text{E}+19 \pm 1.16\%$	$4.9498\text{E}+19 \pm 0.93\%$	$5.6141\text{E}+00$
181.20	$4.8970\text{E}+18 \pm 2.28\%$	$1.4250\text{E}+19 \pm 1.46\%$	$8.7326\text{E}+18 \pm 1.78\%$	$2.2416\text{E}+19 \pm 0.94\%$	$5.0295\text{E}+19 \pm 0.74\%$	$4.5774\text{E}+00$
281.20	$4.6672\text{E}+18 \pm 2.31\%$	$1.3884\text{E}+19 \pm 1.47\%$	$8.3201\text{E}+18 \pm 1.80\%$	$2.2113\text{E}+19 \pm 0.96\%$	$4.8984\text{E}+19 \pm 0.75\%$	$4.7380\text{E}+00$

Table D-101. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-2 Upper Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1225.00	$9.4595\text{E}+14 \pm 16.30\%$	$2.0387\text{E}+15 \pm 10.77\%$	$1.3193\text{E}+15 \pm 12.81\%$	$5.4926\text{E}+17 \pm 3.04\%$	$5.5356\text{E}+17 \pm 3.02\%$	$5.8064\text{E}+02$
775.00	$8.6160\text{E}+14 \pm 22.87\%$	$3.7193\text{E}+15 \pm 15.71\%$	b	$1.4837\text{E}+18 \pm 2.83\%$	$1.4964\text{E}+18 \pm 2.82\%$	$1.7220\text{E}+03$
525.00	b	$8.9274\text{E}+15 \pm 27.78\%$	b	$2.7899\text{E}+18 \pm 2.16\%$	$2.8134\text{E}+18 \pm 2.16\%$	
300.00	b	$6.6647\text{E}+16 \pm 14.91\%$	$9.1095\text{E}+16 \pm 11.23\%$	$5.2858\text{E}+18 \pm 1.76\%$	$5.4605\text{E}+18 \pm 1.74\%$	
100.00	$1.1123\text{E}+17 \pm 9.41\%$	$5.5988\text{E}+17 \pm 4.93\%$	$6.8944\text{E}+17 \pm 4.49\%$	$1.1617\text{E}+19 \pm 1.21\%$	$1.2978\text{E}+19 \pm 1.14\%$	$1.0445\text{E}+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-102. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-2 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
1225.00	$8.7773\text{E}+14 \pm 13.19\%$	$2.0670\text{E}+15 \pm 10.37\%$	$1.4893\text{E}+15 \pm 11.57\%$	$5.4710\text{E}+17 \pm 2.87\%$	$5.5153\text{E}+17 \pm 2.85\%$	$6.2331\text{E}+02$
775.00	$1.0133\text{E}+15 \pm 21.85\%$	$2.5756\text{E}+15 \pm 13.22\%$	$2.3239\text{E}+15 \pm 16.13\%$	$1.5033\text{E}+18 \pm 2.57\%$	$1.5092\text{E}+18 \pm 2.56\%$	$1.4835\text{E}+03$
525.00	b	$7.6670\text{E}+15 \pm 28.60\%$	$1.1369\text{E}+16 \pm 22.68\%$	$2.7091\text{E}+18 \pm 1.98\%$	$2.7321\text{E}+18 \pm 1.98\%$	
300.00	$1.4522\text{E}+16 \pm 24.29\%$	$5.5396\text{E}+16 \pm 15.79\%$	$8.2514\text{E}+16 \pm 11.78\%$	$5.0466\text{E}+18 \pm 1.61\%$	$5.1990\text{E}+18 \pm 1.60\%$	$3.4751\text{E}+02$
100.00	$8.8116\text{E}+16 \pm 8.41\%$	$4.6929\text{E}+17 \pm 4.21\%$	$6.3329\text{E}+17 \pm 3.80\%$	$1.1140\text{E}+19 \pm 1.10\%$	$1.2330\text{E}+19 \pm 1.05\%$	$1.2642\text{E}+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-103. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	$2.4280E+15 \pm 14.04\%$	$4.7462E+15 \pm 9.93\%$	$3.6729E+15 \pm 11.34\%$	$1.3754E+18 \pm 2.38\%$	$1.3863E+18 \pm 2.36\%$	$5.6647E+02$
304.80	$3.1847E+15 \pm 11.07\%$	$5.9250E+15 \pm 8.72\%$	$4.2849E+15 \pm 14.63\%$	$1.3714E+18 \pm 2.40\%$	$1.3848E+18 \pm 2.38\%$	$4.3062E+02$
504.80	$1.3552E+15 \pm 16.23\%$	$4.1030E+15 \pm 11.87\%$	$2.8437E+15 \pm 12.24\%$	$1.3726E+18 \pm 2.47\%$	$1.3809E+18 \pm 2.46\%$	$1.0128E+03$
754.80	$9.4774E+14 \pm 18.16\%$	$2.0509E+15 \pm 12.22\%$	$1.5857E+15 \pm 15.03\%$	$1.2336E+18 \pm 2.31\%$	$1.2382E+18 \pm 2.30\%$	$1.3016E+03$
1104.80	$7.8591E+14 \pm 24.77\%$	$1.3653E+15 \pm 11.82\%$	$1.4693E+15 \pm 13.62\%$	$9.4908E+17 \pm 2.42\%$	$9.5270E+17 \pm 2.41\%$	$1.2076E+03$
1554.80	$2.4468E+14 \pm 28.13\%$	$5.2683E+14 \pm 18.87\%$	$5.8493E+14 \pm 18.02\%$	$5.4572E+17 \pm 3.02\%$	$5.4708E+17 \pm 3.01\%$	$2.2303E+03$
1902.40	b	$3.7644E+14 \pm 26.77\%$	$2.5233E+14 \pm 29.52\%$	$1.8966E+17 \pm 6.26\%$	$1.9050E+17 \pm 6.24\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-104. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	b	$4.8333E+15 \pm 17.91\%$	$3.1571E+15 \pm 24.23\%$	$1.3814E+18 \pm 4.36\%$	$1.3909E+18 \pm 4.33\%$	
304.80	$2.7989E+15 \pm 25.50\%$	$4.8852E+15 \pm 17.23\%$	$3.2274E+15 \pm 22.33\%$	$1.3477E+18 \pm 3.98\%$	$1.3587E+18 \pm 3.95\%$	$4.8153E+02$
504.80	b	$3.3647E+15 \pm 19.90\%$	b	$1.3399E+18 \pm 4.08\%$	$1.3466E+18 \pm 4.06\%$	
754.80	b	$1.8192E+15 \pm 22.98\%$	$1.6750E+15 \pm 23.77\%$	$1.1535E+18 \pm 3.79\%$	$1.1580E+18 \pm 3.78\%$	
1104.80	b	$1.8957E+15 \pm 28.99\%$	$1.2559E+15 \pm 28.22\%$	$9.7221E+17 \pm 3.70\%$	$9.7553E+17 \pm 3.69\%$	
1554.80	b	b	b	$5.1029E+17 \pm 4.72\%$	$5.1149E+17 \pm 4.71\%$	
1902.40	b	b	b	$2.1257E+17 \pm 9.02\%$	$2.1366E+17 \pm 8.97\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-105. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	$2.5900\text{E}+15 \pm 28.86\%$	b	b	$1.1620\text{E}+18 \pm 5.14\%$	$1.1707\text{E}+18 \pm 5.10\%$	$4.4865\text{E}+02$
304.80	b	b	$3.3220\text{E}+15 \pm 26.63\%$	$1.1974\text{E}+18 \pm 5.00\%$	$1.2071\text{E}+18 \pm 4.97\%$	
504.80	b	b	b	$1.3405\text{E}+18 \pm 5.33\%$	$1.3492\text{E}+18 \pm 5.30\%$	
754.80	b	b	b	$1.0255\text{E}+18 \pm 4.88\%$	$1.0293\text{E}+18 \pm 4.86\%$	
1104.80	a	b	b	$8.4475\text{E}+17 \pm 4.87\%$	$8.4747\text{E}+17 \pm 4.86\%$	
1554.80	a	b	b	$4.6698\text{E}+17 \pm 5.54\%$	$4.6820\text{E}+17 \pm 5.52\%$	
1902.40	a	b	a	$1.7606\text{E}+17 \pm 12.47\%$	$1.7663\text{E}+17 \pm 12.43\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-106. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	b	b	b	$1.1353\text{E}+18 \pm 5.28\%$	$1.1450\text{E}+18 \pm 5.24\%$	$2.1330\text{E}+02$
304.80	$5.5978\text{E}+15 \pm 23.45\%$	$5.9262\text{E}+15 \pm 25.83\%$	b	$1.1940\text{E}+18 \pm 5.59\%$	$1.2092\text{E}+18 \pm 5.52\%$	
504.80	b	b	b	$1.1125\text{E}+18 \pm 5.15\%$	$1.1196\text{E}+18 \pm 5.12\%$	
754.80	b	$2.2217\text{E}+15 \pm 29.12\%$	b	$9.6730\text{E}+17 \pm 5.05\%$	$9.7128\text{E}+17 \pm 5.03\%$	
1104.80	b	b	b	$8.1081\text{E}+17 \pm 4.73\%$	$8.1365\text{E}+17 \pm 4.72\%$	
1554.80	b	b	b	$4.5872\text{E}+17 \pm 5.75\%$	$4.6046\text{E}+17 \pm 5.73\%$	
1902.40	a	a	b	$1.6202\text{E}+17 \pm 13.21\%$	$1.6245\text{E}+17 \pm 13.18\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-107. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	b	3.7817E+15 $\pm$ 25.23%	b	1.5252E+18 $\pm$ 4.67%	1.5332E+18 $\pm$ 4.64%	5.1995E+02
304.80	2.9126E+15 $\pm$ 29.97%	6.3136E+15 $\pm$ 24.00%	4.3719E+15 $\pm$ 29.14%	1.5144E+18 $\pm$ 4.53%	1.5280E+18 $\pm$ 4.49%	
504.80	b	b	3.4195E+15 $\pm$ 27.57%	1.5002E+18 $\pm$ 4.95%	1.5083E+18 $\pm$ 4.93%	
754.80	b	2.7327E+15 $\pm$ 27.34%	b	1.3244E+18 $\pm$ 4.63%	1.3295E+18 $\pm$ 4.61%	
1104.80	b	b	b	1.0307E+18 $\pm$ 4.24%	1.0341E+18 $\pm$ 4.23%	
1554.80	b	b	b	5.4941E+17 $\pm$ 5.00%	5.5060E+17 $\pm$ 4.99%	
1902.40	a	b	a	1.7068E+17 $\pm$ 13.04%	1.7174E+17 $\pm$ 12.96%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-108. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
102.40	b	5.1161E+15 $\pm$ 26.05%	b	1.5933E+18 $\pm$ 4.66%	1.6023E+18 $\pm$ 4.63%	
304.80	b	b	b	1.7454E+18 $\pm$ 4.66%	1.7696E+18 $\pm$ 4.76%	
504.80	b	6.0173E+15 $\pm$ 26.76%	b	1.6648E+18 $\pm$ 4.48%	1.6751E+18 $\pm$ 4.45%	
754.80	b	b	b	1.4538E+18 $\pm$ 4.32%	1.4576E+18 $\pm$ 4.31%	
1104.80	b	b	b	1.1469E+18 $\pm$ 4.31%	1.1504E+18 $\pm$ 4.30%	
1554.80	b	b	b	6.3398E+17 $\pm$ 5.07%	6.3521E+17 $\pm$ 5.06%	
1902.40	a	b	b	2.1322E+17 $\pm$ 10.16%	2.1442E+17 $\pm$ 10.11%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-109. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	1.1917E+15 $\pm$ 16.43%	9.1058E+14 $\pm$ 17.80%	9.9614E+17 $\pm$ 2.86%	9.9849E+17 $\pm$ 2.85%	1.7157E+03
300.00	2.8210E+14 $\pm$ 28.41%	6.2313E+14 $\pm$ 20.78%	4.4932E+14 $\pm$ 20.28%	4.8400E+17 $\pm$ 3.75%	4.8535E+17 $\pm$ 3.74%	
445.00	b	b	b	1.9016E+17 $\pm$ 6.44%	1.9120E+17 $\pm$ 6.41%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-110. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	1.0102E+18 $\pm$ 5.00%	1.0117E+18 $\pm$ 4.99%	
300.00	a	b	b	5.0761E+17 $\pm$ 6.51%	5.0877E+17 $\pm$ 6.49%	
445.00	a	b	a	1.5704E+17 $\pm$ 13.14%	1.5733E+17 $\pm$ 13.11%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-111. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	a	$1.0500\text{E}+18 \pm 6.46\%$	$1.0510\text{E}+18 \pm 6.46\%$	
300.00	a	b	b	$5.1479\text{E}+17 \pm 8.64\%$	$5.1587\text{E}+17 \pm 8.62\%$	
445.00	a	a	b	$1.7150\text{E}+17 \pm 17.13\%$	$1.7230\text{E}+17 \pm 17.05\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-112. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$9.8617\text{E}+17 \pm 5.78\%$	$9.9057\text{E}+17 \pm 5.76\%$	
300.00	a	b	a	$4.8393\text{E}+17 \pm 8.58\%$	$4.8552\text{E}+17 \pm 8.55\%$	
445.00	a	b	b	$2.3843\text{E}+17 \pm 19.05\%$	$2.4038\text{E}+17 \pm 18.90\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-113. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	$9.5400\text{E}+17 \pm 6.32\%$	$9.5726\text{E}+17 \pm 6.30\%$	
300.00	a	b	b	$5.2693\text{E}+17 \pm 8.00\%$	$5.2830\text{E}+17 \pm 7.98\%$	
445.00	a	a	a	$1.6428\text{E}+17 \pm 16.82\%$	$1.6513\text{E}+17 \pm 16.74\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-114. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	$1.0134\text{E}+18 \pm 6.84\%$	$1.0152\text{E}+18 \pm 6.82\%$	
300.00	a	b	b	$4.9307\text{E}+17 \pm 8.50\%$	$4.9511\text{E}+17 \pm 8.46\%$	
445.00	a	b	a	$2.0267\text{E}+17 \pm 17.35\%$	$2.0296\text{E}+17 \pm 17.32\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-115. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	$4.8823\text{E}+14 \pm 26.42\%$	$2.0991\text{E}+15 \pm 14.07\%$	$1.3220\text{E}+15 \pm 14.56\%$	$1.9948\text{E}+18 \pm 2.10\%$	$1.9987\text{E}+18 \pm 2.10\%$	$4.0857\text{E}+03$
300.00	$3.0906\text{E}+14 \pm 28.73\%$	$1.0212\text{E}+15 \pm 15.86\%$	$8.1036\text{E}+14 \pm 18.11\%$	$1.1754\text{E}+18 \pm 2.63\%$	$1.1775\text{E}+18 \pm 2.62\%$	$3.8030\text{E}+03$
500.00	$2.9060\text{E}+14 \pm 27.05\%$	$8.3619\text{E}+14 \pm 23.18\%$	$3.7209\text{E}+14 \pm 28.56\%$	$6.0193\text{E}+17 \pm 3.57\%$	$6.0342\text{E}+17 \pm 3.56\%$	$2.0713\text{E}+03$
680.00	b	$4.4538\text{E}+14 \pm 21.55\%$	b	$2.4007\text{E}+17 \pm 5.25\%$	$2.4116\text{E}+17 \pm 5.22\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-116. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-3 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$2.0416\text{E}+18 \pm 3.73\%$	$2.0441\text{E}+18 \pm 3.72\%$	
300.00	b	b	b	$1.2284\text{E}+18 \pm 4.88\%$	$1.2305\text{E}+18 \pm 4.87\%$	
500.00	b	b	b	$5.4187\text{E}+17 \pm 6.10\%$	$5.4317\text{E}+17 \pm 6.08\%$	
680.00	b	a	a	$2.6588\text{E}+17 \pm 10.08\%$	$2.6644\text{E}+17 \pm 10.06\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-117. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-3 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$2.0451\text{E}+18 \pm 4.65\%$	$2.0478\text{E}+18 \pm 4.65\%$	
300.00	a	b	b	$1.0931\text{E}+18 \pm 5.99\%$	$1.0949\text{E}+18 \pm 5.98\%$	
500.00	a	b	a	$5.7899\text{E}+17 \pm 7.19\%$	$5.7988\text{E}+17 \pm 7.18\%$	
680.00	a	b	b	$2.7425\text{E}+17 \pm 11.57\%$	$2.7540\text{E}+17 \pm 11.53\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-118. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-3 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	2.1489E+18 $\pm$ 4.76%	2.1513E+18 $\pm$ 4.75%	
300.00	a	b	b	1.2243E+18 $\pm$ 5.47%	1.2255E+18 $\pm$ 5.46%	
500.00	a	b	b	5.5468E+17 $\pm$ 7.84%	5.5538E+17 $\pm$ 7.83%	
680.00	a	b	a	2.2736E+17 $\pm$ 11.67%	2.2855E+17 $\pm$ 11.61%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-119. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-3 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	2.0813E+18 $\pm$ 4.98%	2.0830E+18 $\pm$ 4.98%	
300.00	a	b	b	1.1532E+18 $\pm$ 5.99%	1.1572E+18 $\pm$ 5.97%	
500.00	a	b	b	5.6715E+17 $\pm$ 7.49%	5.6860E+17 $\pm$ 7.48%	
680.00	a	a	a	2.5883E+17 $\pm$ 12.16%	2.5936E+17 $\pm$ 12.14%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-120. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$1.9371\text{E}+18 \pm 4.98\%$	$1.9417\text{E}+18 \pm 4.97\%$	
300.00	b	b	b	$1.0537\text{E}+18 \pm 5.71\%$	$1.0557\text{E}+18 \pm 5.70\%$	
500.00	a	b	b	$5.6714\text{E}+17 \pm 7.90\%$	$5.6885\text{E}+17 \pm 7.87\%$	
680.00	a	a	b	$2.5430\text{E}+17 \pm 13.35\%$	$2.5503\text{E}+17 \pm 13.32\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-121. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	$3.9318\text{E}+14 \pm 23.66\%$	$1.7672\text{E}+15 \pm 15.06\%$	$1.4588\text{E}+15 \pm 14.71\%$	$1.7744\text{E}+18 \pm 2.15\%$	$1.7780\text{E}+18 \pm 2.14\%$	$4.5130\text{E}+03$
300.00	$3.6673\text{E}+14 \pm 25.62\%$	$1.2149\text{E}+15 \pm 19.34\%$	$1.0748\text{E}+15 \pm 15.05\%$	$1.0501\text{E}+18 \pm 2.72\%$	$1.0528\text{E}+18 \pm 2.71\%$	$2.8636\text{E}+03$
500.00	$3.1098\text{E}+14 \pm 28.58\%$	$6.2177\text{E}+14 \pm 21.20\%$	$5.5614\text{E}+14 \pm 17.88\%$	$5.4579\text{E}+17 \pm 3.57\%$	$5.4728\text{E}+17 \pm 3.56\%$	$1.7550\text{E}+03$
680.00	b	$7.2542\text{E}+14 \pm 25.76\%$	$3.5327\text{E}+14 \pm 28.02\%$	$2.1159\text{E}+17 \pm 5.30\%$	$2.1288\text{E}+17 \pm 5.27\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-122. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	$1.5150\text{E}+15 \pm 28.69\%$	$1.7876\text{E}+18 \pm 3.92\%$	$1.7905\text{E}+18 \pm 3.91\%$	
300.00	a	b	b	$1.0050\text{E}+18 \pm 4.76\%$	$1.0075\text{E}+18 \pm 4.75\%$	
500.00	a	b	b	$5.4300\text{E}+17 \pm 6.59\%$	$5.4457\text{E}+17 \pm 6.58\%$	
680.00	a	b	b	$2.0677\text{E}+17 \pm 10.05\%$	$2.0755\text{E}+17 \pm 10.01\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-123. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$1.7721\text{E}+18 \pm 4.98\%$	$1.7734\text{E}+18 \pm 4.98\%$	
300.00	b	b	b	$1.0314\text{E}+18 \pm 6.30\%$	$1.0333\text{E}+18 \pm 6.29\%$	
500.00	b	b	b	$5.0589\text{E}+17 \pm 8.08\%$	$5.0879\text{E}+17 \pm 8.04\%$	
680.00	a	b	b	$2.2541\text{E}+17 \pm 14.28\%$	$2.2694\text{E}+17 \pm 14.19\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-124. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-4 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$1.9869\text{E}+18 \pm 4.81\%$	$1.9898\text{E}+18 \pm 4.81\%$	
300.00	a	b	b	$1.0687\text{E}+18 \pm 5.93\%$	$1.0696\text{E}+18 \pm 5.92\%$	
500.00	b	b	b	$5.4600\text{E}+17 \pm 7.64\%$	$5.4734\text{E}+17 \pm 7.63\%$	
680.00	a	a	b	$2.2818\text{E}+17 \pm 11.36\%$	$2.2914\text{E}+17 \pm 11.31\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-125. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Tube PT-4 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$1.9417\text{E}+18 \pm 4.60\%$	$1.9462\text{E}+18 \pm 4.59\%$	
300.00	a	b	b	$9.3523\text{E}+17 \pm 6.30\%$	$9.3756\text{E}+17 \pm 6.29\%$	
500.00	a	b	b	$5.6013\text{E}+17 \pm 7.80\%$	$5.6141\text{E}+17 \pm 7.78\%$	
680.00	a	b	a	$2.3230\text{E}+17 \pm 12.06\%$	$2.3289\text{E}+17 \pm 12.03\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-126. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	1.7362E+18 $\pm$ 4.76%	1.7398E+18 $\pm$ 4.75%	
300.00	a	b	b	1.0765E+18 $\pm$ 5.80%	1.0787E+18 $\pm$ 5.79%	
500.00	a	b	b	6.1623E+17 $\pm$ 7.60%	6.1786E+17 $\pm$ 7.58%	
680.00	a	a	a	1.9348E+17 $\pm$ 13.07%	1.9396E+17 $\pm$ 13.04%	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-127. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	8.9336E+14 $\pm$ 18.49%	7.2631E+14 $\pm$ 19.72%	8.0342E+17 $\pm$ 2.97%	8.0527E+17 $\pm$ 2.96%	
300.00	1.5577E+14 $\pm$ 29.15%	b	5.1479E+14 $\pm$ 27.52%	4.0157E+17 $\pm$ 4.09%	4.0293E+17 $\pm$ 4.08%	2.5780E+03
445.00	b	5.7495E+14 $\pm$ 28.31%	2.8861E+14 $\pm$ 28.24%	1.5482E+17 $\pm$ 6.31%	1.5594E+17 $\pm$ 6.27%	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-128. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	8.3415E+17 $\pm$ 5.34%	8.3561E+17 $\pm$ 5.33%	
300.00	a	b	b	4.0202E+17 $\pm$ 7.04%	4.0298E+17 $\pm$ 7.03%	
445.00	a	b	a	1.7689E+17 $\pm$ 13.97%	1.7794E+17 $\pm$ 13.89%	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-129. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	b	b	b	$7.8853\text{E}+17 \pm 6.25\%$	$7.9270\text{E}+17 \pm 6.22\%$	
300.00	a	b	b	$3.9503\text{E}+17 \pm 8.97\%$	$3.9587\text{E}+17 \pm 8.95\%$	
445.00	a	a	b	$1.2423\text{E}+17 \pm 17.01\%$	$1.2546\text{E}+17 \pm 16.86\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-130. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	a	$7.9354\text{E}+17 \pm 8.07\%$	$7.9397\text{E}+17 \pm 8.07\%$	
300.00	a	b	a	$3.8892\text{E}+17 \pm 8.91\%$	$3.8962\text{E}+17 \pm 8.90\%$	
445.00	a	b	b	$1.1833\text{E}+17 \pm 20.39\%$	$1.2008\text{E}+17 \pm 20.11\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-131. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	$8.4649\text{E}+17 \pm 6.58\%$	$8.4805\text{E}+17 \pm 6.57\%$	
300.00	b	b	a	$4.3140\text{E}+17 \pm 9.19\%$	$4.3236\text{E}+17 \pm 9.17\%$	
445.00	a	a	a	$1.3949\text{E}+17 \pm 16.12\%$	$1.4020\text{E}+17 \pm 16.04\%$	

a No particle interactions recorded.
b Poor statistics; value not reported.

Table D-132. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.00	a	b	b	7.4811E+17 $\pm$ 6.47%	7.4891E+17 $\pm$ 6.46%	
300.00	b	b	b	4.4956E+17 $\pm$ 10.18%	4.5158E+17 $\pm$ 10.14%	
445.00	a	a	a	1.8237E+17 $\pm$ 14.07%	1.8259E+17 $\pm$ 14.06%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-133. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Facility PF-1 Outer Shell. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
149.40	b	b	b	1.2932E+17 $\pm$ 8.73%	1.2972E+17 $\pm$ 8.71%	
448.80	b	b	b	1.2921E+17 $\pm$ 8.22%	1.2955E+17 $\pm$ 8.20%	
798.80	b	b	b	8.7766E+16 $\pm$ 9.65%	8.8324E+16 $\pm$ 9.60%	
1248.80	b	b	b	4.1050E+16 $\pm$ 11.19%	4.1190E+16 $\pm$ 11.16%	
2024.20	a	a	b	3.3803E+15 $\pm$ 26.55%	3.3927E+15 $\pm$ 26.46%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-134. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Facility PF-1 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
149.40	a	a	a	1.1842E+17 $\pm$ 14.86%	1.1855E+17 $\pm$ 14.84%	
448.80	a	a	a	1.2841E+17 $\pm$ 17.10%	1.2854E+17 $\pm$ 17.08%	
798.80	a	a	b	8.5298E+16 $\pm$ 19.07%	8.5507E+16 $\pm$ 19.03%	
1248.80	a	a	a	3.0310E+16 $\pm$ 21.89%	3.0428E+16 $\pm$ 21.81%	
2024.20	a	a	a	b	b	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-135. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Facility PF-2 Outer Shell. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
150.60	b	b	b	$5.6040\text{E}+16 \pm 11.97\%$	$5.6237\text{E}+16 \pm 11.93\%$	
451.20	b	b	a	$5.8839\text{E}+16 \pm 11.54\%$	$5.9036\text{E}+16 \pm 11.51\%$	
801.20	a	b	b	$4.5224\text{E}+16 \pm 14.14\%$	$4.5555\text{E}+16 \pm 14.05\%$	
1251.20	b	a	b	$2.2130\text{E}+16 \pm 18.24\%$	$2.2234\text{E}+16 \pm 18.16\%$	
2046.60	a	a	a	b	b	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-136. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Facility PF-2 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
150.60	a	a	a	$5.6638\text{E}+16 \pm 21.95\%$	$5.6638\text{E}+16 \pm 21.95\%$	
451.20	a	a	a	b	b	
801.20	a	a	a	b	b	
1251.20	a	a	a	$2.9872\text{E}+16 \pm 27.25\%$	$2.9872\text{E}+16 \pm 27.25\%$	
2046.60	a	a	a	b	b	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-137. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	1.0867E+15 ± 23.96%	2.7968E+15 ± 15.23%	3.0698E+15 ± 15.25%	2.8177E+18 ± 2.00%	2.8246E+18 ± 2.00%	2.5929E+03
300.38	2.2995E+15 ± 16.27%	5.7882E+15 ± 11.08%	4.2076E+15 ± 12.69%	2.8734E+18 ± 2.04%	2.8857E+18 ± 2.04%	1.2496E+03
500.38	2.7166E+15 ± 15.98%	6.2239E+15 ± 10.00%	5.5639E+15 ± 13.39%	2.8335E+18 ± 1.97%	2.8480E+18 ± 1.96%	1.0430E+03
700.38	1.3279E+15 ± 19.63%	4.3491E+15 ± 12.44%	3.4215E+15 ± 14.33%	2.7634E+18 ± 2.06%	2.7725E+18 ± 2.06%	2.0811E+03
900.38	8.4334E+14 ± 21.58%	3.7698E+15 ± 15.91%	2.0772E+15 ± 18.41%	2.6954E+18 ± 2.10%	2.7021E+18 ± 2.09%	3.1961E+03
1150.38	1.4988E+15 ± 19.90%	2.7760E+15 ± 12.21%	2.4517E+15 ± 13.30%	2.6571E+18 ± 1.99%	2.6638E+18 ± 1.98%	1.7728E+03
1450.38	2.8026E+14 ± 29.66%	9.8938E+14 ± 21.30%	1.0431E+15 ± 18.84%	1.9841E+18 ± 2.24%	1.9864E+18 ± 2.24%	7.0796E+03
1750.38	b	6.7902E+14 ± 22.43%	4.3051E+14 ± 27.72%	1.1966E+18 ± 2.86%	1.1979E+18 ± 2.85%	
2135.19	b	4.8730E+14 ± 26.58%	5.0931E+14 ± 22.16%	4.6471E+17 ± 3.60%	4.6595E+17 ± 3.59%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-138. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-1 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	2.7081E+15 ± 18.50%	3.0015E+15 ± 17.97%	2.6887E+18 ± 2.18%	2.6956E+18 ± 2.18%	
300.38	2.6642E+15 ± 17.64%	5.6743E+15 ± 12.27%	4.5086E+15 ± 14.05%	2.8115E+18 ± 2.20%	2.8244E+18 ± 2.20%	1.0553E+03
500.38	2.6675E+15 ± 16.42%	6.4868E+15 ± 11.81%	5.6403E+15 ± 18.56%	2.6445E+18 ± 2.15%	2.6593E+18 ± 2.14%	9.9140E+02
700.38	1.6889E+15 ± 21.50%	4.4489E+15 ± 14.28%	3.3769E+15 ± 17.10%	2.6129E+18 ± 2.24%	2.6224E+18 ± 2.24%	1.5471E+03
900.38	1.0809E+15 ± 29.94%	2.9957E+15 ± 17.83%	1.7112E+15 ± 19.56%	2.6418E+18 ± 2.35%	2.6476E+18 ± 2.34%	2.4442E+03
1150.38	1.2675E+15 ± 20.45%	2.8473E+15 ± 14.28%	2.8760E+15 ± 17.73%	2.5508E+18 ± 2.15%	2.5578E+18 ± 2.15%	2.0126E+03
1450.38	b	8.2286E+14 ± 24.23%	1.2385E+15 ± 20.57%	1.9941E+18 ± 2.45%	1.9966E+18 ± 2.45%	
1750.38	b	6.2270E+14 ± 26.38%	b	1.1751E+18 ± 3.08%	1.1769E+18 ± 3.07%	
2135.19	b	4.0438E+14 ± 29.60%	5.3207E+14 ± 23.06%	4.7368E+17 ± 3.91%	4.7475E+17 ± 3.90%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-139. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-1 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	$2.5314\text{E}+15 \pm 21.13\%$	$2.6521\text{E}+15 \pm 20.93\%$	$2.3424\text{E}+18 \pm 2.53\%$	$2.3490\text{E}+18 \pm 2.52\%$	
300.38	$2.5514\text{E}+15 \pm 22.98\%$	$5.8722\text{E}+15 \pm 15.34\%$	$3.5762\text{E}+15 \pm 18.86\%$	$2.4684\text{E}+18 \pm 2.55\%$	$2.4804\text{E}+18 \pm 2.53\%$	$9.6749\text{E}+02$
500.38	$2.8447\text{E}+15 \pm 27.38\%$	$5.8966\text{E}+15 \pm 18.19\%$	b	$2.3401\text{E}+18 \pm 2.62\%$	$2.3567\text{E}+18 \pm 2.61\%$	$8.2261\text{E}+02$
700.38	$1.2498\text{E}+15 \pm 27.60\%$	$3.3094\text{E}+15 \pm 21.08\%$	$3.9840\text{E}+15 \pm 20.17\%$	$2.3230\text{E}+18 \pm 2.68\%$	$2.3316\text{E}+18 \pm 2.67\%$	$1.8587\text{E}+03$
900.38	b	$3.0406\text{E}+15 \pm 20.63\%$	$1.8851\text{E}+15 \pm 24.77\%$	$2.2579\text{E}+18 \pm 2.69\%$	$2.2648\text{E}+18 \pm 2.68\%$	
1150.38	$9.1501\text{E}+14 \pm 29.02\%$	$2.6345\text{E}+15 \pm 19.75\%$	$2.0975\text{E}+15 \pm 20.24\%$	$2.5480\text{E}+18 \pm 2.57\%$	$2.5536\text{E}+18 \pm 2.56\%$	$2.7846\text{E}+03$
1450.38	b	b	$1.6522\text{E}+15 \pm 27.86\%$	$1.9818\text{E}+18 \pm 2.88\%$	$1.9845\text{E}+18 \pm 2.88\%$	
1750.38	b	b	b	$1.2241\text{E}+18 \pm 3.60\%$	$1.2258\text{E}+18 \pm 3.59\%$	
2135.19	b	b	b	$4.5923\text{E}+17 \pm 4.50\%$	$4.6044\text{E}+17 \pm 4.49\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-140. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-1 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	$2.9948\text{E}+15 \pm 26.73\%$	$3.0080\text{E}+15 \pm 25.83\%$	$2.1061\text{E}+18 \pm 2.84\%$	$2.1139\text{E}+18 \pm 2.83\%$	
300.38	$2.9226\text{E}+15 \pm 24.34\%$	$5.2905\text{E}+15 \pm 18.41\%$	$3.8110\text{E}+15 \pm 26.86\%$	$2.0230\text{E}+18 \pm 2.81\%$	$2.0351\text{E}+18 \pm 2.79\%$	$6.9221\text{E}+02$
500.38	b	$5.4385\text{E}+15 \pm 19.55\%$	$4.2347\text{E}+15 \pm 21.58\%$	$2.0032\text{E}+18 \pm 2.86\%$	$2.0161\text{E}+18 \pm 2.85\%$	
700.38	b	$3.5763\text{E}+15 \pm 23.86\%$	$3.6671\text{E}+15 \pm 26.44\%$	$1.9784\text{E}+18 \pm 2.94\%$	$1.9868\text{E}+18 \pm 2.93\%$	
935.19	b	$3.2715\text{E}+15 \pm 21.85\%$	b	$1.9207\text{E}+18 \pm 2.67\%$	$1.9271\text{E}+18 \pm 2.66\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-141. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	$1.0458\text{E}+15 \pm 20.68\%$	$3.3770\text{E}+15 \pm 15.07\%$	$2.7325\text{E}+15 \pm 14.54\%$	$2.8397\text{E}+18 \pm 1.97\%$	$2.8468\text{E}+18 \pm 1.97\%$	$2.7153\text{E}+03$
300.38	$2.3431\text{E}+15 \pm 14.91\%$	$6.8467\text{E}+15 \pm 10.16\%$	$4.8553\text{E}+15 \pm 12.06\%$	$2.7694\text{E}+18 \pm 1.97\%$	$2.7835\text{E}+18 \pm 1.96\%$	$1.1820\text{E}+03$
500.38	$3.6897\text{E}+15 \pm 13.91\%$	$7.2946\text{E}+15 \pm 10.00\%$	$5.8189\text{E}+15 \pm 10.15\%$	$2.6623\text{E}+18 \pm 1.98\%$	$2.6791\text{E}+18 \pm 1.96\%$	$7.2156\text{E}+02$
700.38	$2.1133\text{E}+15 \pm 17.70\%$	$5.5238\text{E}+15 \pm 14.11\%$	$4.2198\text{E}+15 \pm 12.81\%$	$2.6746\text{E}+18 \pm 2.03\%$	$2.6865\text{E}+18 \pm 2.02\%$	$1.2656\text{E}+03$
900.38	$1.0150\text{E}+15 \pm 22.42\%$	$3.1459\text{E}+15 \pm 14.60\%$	$2.7783\text{E}+15 \pm 15.68\%$	$2.6655\text{E}+18 \pm 2.14\%$	$2.6725\text{E}+18 \pm 2.13\%$	$2.6261\text{E}+03$
1150.38	$1.3121\text{E}+15 \pm 18.53\%$	$3.0153\text{E}+15 \pm 13.34\%$	$2.5462\text{E}+15 \pm 13.96\%$	$2.5360\text{E}+18 \pm 1.96\%$	$2.5429\text{E}+18 \pm 1.96\%$	$1.9329\text{E}+03$
1450.38	$5.6808\text{E}+14 \pm 25.99\%$	$1.3593\text{E}+15 \pm 20.04\%$	$1.0780\text{E}+15 \pm 21.83\%$	$2.0462\text{E}+18 \pm 2.30\%$	$2.0492\text{E}+18 \pm 2.29\%$	$3.6019\text{E}+03$
1750.38	b	$1.0730\text{E}+15 \pm 22.88\%$	$5.5087\text{E}+14 \pm 24.25\%$	$1.2307\text{E}+18 \pm 2.86\%$	$1.2326\text{E}+18 \pm 2.86\%$	
2135.19	b	$6.3811\text{E}+14 \pm 19.79\%$	$4.7412\text{E}+14 \pm 26.31\%$	$4.9468\text{E}+17 \pm 3.45\%$	$4.9603\text{E}+17 \pm 3.44\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-142. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	$1.4799\text{E}+15 \pm 25.71\%$	$2.9310\text{E}+15 \pm 18.70\%$	$3.3732\text{E}+15 \pm 17.71\%$	$2.7096\text{E}+18 \pm 2.25\%$	$2.7174\text{E}+18 \pm 2.25\%$	$1.8309\text{E}+03$
300.38	$1.8195\text{E}+15 \pm 19.15\%$	$7.0295\text{E}+15 \pm 11.71\%$	$4.9730\text{E}+15 \pm 13.67\%$	$2.6559\text{E}+18 \pm 2.19\%$	$2.6697\text{E}+18 \pm 2.18\%$	$1.4597\text{E}+03$
500.38	$3.8697\text{E}+15 \pm 16.99\%$	$8.0003\text{E}+15 \pm 11.23\%$	$6.1388\text{E}+15 \pm 13.19\%$	$2.5443\text{E}+18 \pm 2.18\%$	$2.5623\text{E}+18 \pm 2.17\%$	$6.5749\text{E}+02$
700.38	$1.9337\text{E}+15 \pm 20.77\%$	$5.0940\text{E}+15 \pm 14.01\%$	$4.9502\text{E}+15 \pm 15.83\%$	$2.5055\text{E}+18 \pm 2.26\%$	$2.5175\text{E}+18 \pm 2.25\%$	$1.2957\text{E}+03$
900.38	b	$3.1073\text{E}+15 \pm 17.04\%$	$2.4838\text{E}+15 \pm 16.58\%$	$2.5090\text{E}+18 \pm 2.31\%$	$2.5152\text{E}+18 \pm 2.30\%$	
1150.38	$7.4777\text{E}+14 \pm 26.93\%$	$2.5166\text{E}+15 \pm 14.30\%$	$2.5471\text{E}+15 \pm 15.42\%$	$2.4706\text{E}+18 \pm 2.13\%$	$2.4764\text{E}+18 \pm 2.12\%$	$3.3039\text{E}+03$
1450.38	$6.5925\text{E}+14 \pm 29.01\%$	$1.4291\text{E}+15 \pm 21.47\%$	$8.3421\text{E}+14 \pm 23.92\%$	$2.0295\text{E}+18 \pm 2.43\%$	$2.0324\text{E}+18 \pm 2.42\%$	$3.0785\text{E}+03$
1750.38	b	$7.2970\text{E}+14 \pm 28.53\%$	b	$1.2574\text{E}+18 \pm 3.11\%$	$1.2590\text{E}+18 \pm 3.11\%$	
2135.19	b	$6.4770\text{E}+14 \pm 25.25\%$	b	$4.9720\text{E}+17 \pm 3.75\%$	$4.9843\text{E}+17 \pm 3.74\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-143. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	3.0932E+15 $\pm$ 20.46%	3.0115E+15 $\pm$ 27.37%	2.4291E+18 $\pm$ 2.63%	2.4364E+18 $\pm$ 2.63%	
300.38	b	7.0932E+15 $\pm$ 14.34%	5.4470E+15 $\pm$ 20.75%	2.3471E+18 $\pm$ 2.62%	2.3617E+18 $\pm$ 2.60%	
500.38	2.9053E+15 $\pm$ 20.93%	8.7553E+15 $\pm$ 14.55%	4.9158E+15 $\pm$ 15.16%	2.2025E+18 $\pm$ 2.58%	2.2191E+18 $\pm$ 2.56%	7.5809E+02
700.38	1.8995E+15 $\pm$ 25.88%	3.9366E+15 $\pm$ 17.44%	3.7309E+15 $\pm$ 17.69%	2.2836E+18 $\pm$ 2.70%	2.2932E+18 $\pm$ 2.69%	1.2023E+03
900.38	b	2.9840E+15 $\pm$ 24.44%	2.7033E+15 $\pm$ 22.38%	2.1763E+18 $\pm$ 2.76%	2.1828E+18 $\pm$ 2.75%	
1150.38	b	3.5397E+15 $\pm$ 18.35%	2.7982E+15 $\pm$ 17.59%	2.4023E+18 $\pm$ 2.44%	2.4104E+18 $\pm$ 2.44%	
1450.38	b	1.0930E+15 $\pm$ 29.42%	b	2.0393E+18 $\pm$ 2.83%	2.0420E+18 $\pm$ 2.82%	
1750.38	b	b	b	1.2670E+18 $\pm$ 3.60%	1.2688E+18 $\pm$ 3.59%	
2135.19	b	7.5623E+14 $\pm$ 29.16%	b	4.9779E+17 $\pm$ 4.29%	4.9907E+17 $\pm$ 4.28%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-144. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	3.9917E+15 $\pm$ 22.32%	1.9688E+15 $\pm$ 28.49%	2.0623E+18 $\pm$ 2.89%	2.0697E+18 $\pm$ 2.88%	
300.38	b	7.5391E+15 $\pm$ 16.26%	3.8405E+15 $\pm$ 22.54%	1.9235E+18 $\pm$ 2.90%	1.9359E+18 $\pm$ 2.88%	
500.38	2.8509E+15 $\pm$ 25.20%	7.2438E+15 $\pm$ 16.48%	4.1210E+15 $\pm$ 22.57%	1.9510E+18 $\pm$ 2.97%	1.9652E+18 $\pm$ 2.95%	6.8434E+02
700.38	b	3.1285E+15 $\pm$ 20.18%	4.0506E+15 $\pm$ 21.95%	1.9682E+18 $\pm$ 2.96%	1.9778E+18 $\pm$ 2.94%	
935.19	b	2.8659E+15 $\pm$ 27.74%	2.8293E+15 $\pm$ 22.11%	1.8565E+18 $\pm$ 2.63%	1.8637E+18 $\pm$ 2.62%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-145. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	$1.3795\text{E}+15 \pm 23.32\%$	$2.3708\text{E}+15 \pm 15.01\%$	$2.8169\text{E}+15 \pm 24.06\%$	$2.6198\text{E}+18 \pm 2.19\%$	$2.6263\text{E}+18 \pm 2.19\%$	$1.8990\text{E}+03$
300.38	$2.3449\text{E}+15 \pm 14.94\%$	$5.9364\text{E}+15 \pm 10.87\%$	$5.4877\text{E}+15 \pm 29.81\%$	$2.5900\text{E}+18 \pm 2.14\%$	$2.6037\text{E}+18 \pm 2.13\%$	$1.1045\text{E}+03$
500.38	$2.6205\text{E}+15 \pm 13.58\%$	$7.2357\text{E}+15 \pm 11.02\%$	$5.6962\text{E}+15 \pm 14.92\%$	$2.6542\text{E}+18 \pm 2.04\%$	$2.6697\text{E}+18 \pm 2.03\%$	$1.0128\text{E}+03$
700.38	$1.2539\text{E}+15 \pm 21.36\%$	$6.0809\text{E}+15 \pm 22.34\%$	$4.1169\text{E}+15 \pm 21.13\%$	$2.4752\text{E}+18 \pm 2.15\%$	$2.4866\text{E}+18 \pm 2.13\%$	$1.9740\text{E}+03$
900.38	$1.6484\text{E}+15 \pm 20.05\%$	$3.3802\text{E}+15 \pm 13.40\%$	$2.3691\text{E}+15 \pm 16.79\%$	$2.1907\text{E}+18 \pm 2.30\%$	$2.1981\text{E}+18 \pm 2.29\%$	$1.3290\text{E}+03$
1150.38	$1.0284\text{E}+15 \pm 18.70\%$	$3.8806\text{E}+15 \pm 11.72\%$	$2.0562\text{E}+15 \pm 13.18\%$	$2.1122\text{E}+18 \pm 2.17\%$	$2.1192\text{E}+18 \pm 2.16\%$	$2.0538\text{E}+03$
1450.38	$7.2502\text{E}+14 \pm 23.36\%$	$1.7726\text{E}+15 \pm 15.55\%$	$1.6129\text{E}+15 \pm 19.48\%$	$1.5655\text{E}+18 \pm 2.46\%$	$1.5696\text{E}+18 \pm 2.45\%$	$2.1592\text{E}+03$
1750.38	b	$1.0833\text{E}+15 \pm 21.96\%$	$8.1764\text{E}+14 \pm 24.30\%$	$9.2659\text{E}+17 \pm 3.10\%$	$9.2876\text{E}+17 \pm 3.10\%$	
2135.19	b	$6.7839\text{E}+14 \pm 20.52\%$	$5.2815\text{E}+14 \pm 22.82\%$	$4.0160\text{E}+17 \pm 3.75\%$	$4.0312\text{E}+17 \pm 3.74\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-146. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-3 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	$1.2660\text{E}+15 \pm 25.21\%$	$2.4807\text{E}+15 \pm 19.19\%$	$3.3765\text{E}+15 \pm 29.43\%$	$2.5387\text{E}+18 \pm 2.37\%$	$2.5459\text{E}+18 \pm 2.36\%$	$2.0053\text{E}+03$
300.38	$2.5882\text{E}+15 \pm 18.72\%$	$5.8711\text{E}+15 \pm 12.06\%$	$4.8126\text{E}+15 \pm 17.78\%$	$2.5191\text{E}+18 \pm 2.33\%$	$2.5323\text{E}+18 \pm 2.31\%$	$9.7328\text{E}+02$
500.38	$2.8220\text{E}+15 \pm 17.26\%$	$8.0748\text{E}+15 \pm 14.24\%$	$5.1396\text{E}+15 \pm 16.60\%$	$2.5435\text{E}+18 \pm 2.33\%$	$2.5595\text{E}+18 \pm 2.31\%$	$9.0131\text{E}+02$
700.38	$6.8899\text{E}+14 \pm 29.07\%$	$5.3749\text{E}+15 \pm 20.76\%$	$3.6156\text{E}+15 \pm 15.19\%$	$2.4118\text{E}+18 \pm 2.36\%$	$2.4215\text{E}+18 \pm 2.35\%$	$3.5005\text{E}+03$
900.38	$1.2174\text{E}+15 \pm 26.05\%$	$3.8789\text{E}+15 \pm 16.91\%$	$2.6497\text{E}+15 \pm 19.69\%$	$2.0654\text{E}+18 \pm 2.55\%$	$2.0731\text{E}+18 \pm 2.54\%$	$1.6965\text{E}+03$
1150.38	b	$3.1823\text{E}+15 \pm 12.96\%$	$2.3161\text{E}+15 \pm 17.45\%$	$2.0642\text{E}+18 \pm 2.34\%$	$2.0710\text{E}+18 \pm 2.33\%$	
1450.38	$6.1965\text{E}+14 \pm 26.35\%$	$1.9980\text{E}+15 \pm 18.36\%$	$1.0903\text{E}+15 \pm 22.13\%$	$1.5775\text{E}+18 \pm 2.71\%$	$1.5812\text{E}+18 \pm 2.70\%$	$2.5458\text{E}+03$
1750.38	b	$1.1814\text{E}+15 \pm 23.04\%$	$6.6935\text{E}+14 \pm 29.28\%$	$9.6187\text{E}+17 \pm 3.38\%$	$9.6385\text{E}+17 \pm 3.37\%$	
2135.19	b	$1.0747\text{E}+15 \pm 22.52\%$	$7.4276\text{E}+14 \pm 24.22\%$	$3.8854\text{E}+17 \pm 4.02\%$	$3.9064\text{E}+17 \pm 4.00\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-147. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	1.7363E+15 $\pm$ 26.20%	b	2.2649E+18 $\pm$ 2.78%	2.2729E+18 $\pm$ 2.77%	
300.38	2.2240E+15 $\pm$ 25.88%	7.5978E+15 $\pm$ 16.16%	4.5237E+15 $\pm$ 18.90%	2.2259E+18 $\pm$ 2.82%	2.2403E+18 $\pm$ 2.81%	1.0009E+03
500.38	2.4177E+15 $\pm$ 24.18%	9.9728E+15 $\pm$ 29.61%	b	2.2847E+18 $\pm$ 2.74%	2.3028E+18 $\pm$ 2.73%	9.4501E+02
700.38	b	5.7626E+15 $\pm$ 29.27%	3.8789E+15 $\pm$ 19.77%	2.1028E+18 $\pm$ 2.81%	2.1133E+18 $\pm$ 2.80%	
900.38	b	3.3907E+15 $\pm$ 23.12%	2.4113E+15 $\pm$ 24.67%	1.8375E+18 $\pm$ 2.99%	1.8441E+18 $\pm$ 2.98%	
1150.38	b	3.3954E+15 $\pm$ 17.76%	1.8835E+15 $\pm$ 22.93%	2.0044E+18 $\pm$ 2.73%	2.0106E+18 $\pm$ 2.72%	
1450.38	b	1.7762E+15 $\pm$ 24.04%	1.3184E+15 $\pm$ 27.54%	1.5720E+18 $\pm$ 3.11%	1.5758E+18 $\pm$ 3.10%	
1750.38	b	b	b	9.6043E+17 $\pm$ 3.88%	9.6180E+17 $\pm$ 3.88%	
2135.19	b	1.0452E+15 $\pm$ 28.17%	7.9899E+14 $\pm$ 26.26%	3.6952E+17 $\pm$ 4.73%	3.7156E+17 $\pm$ 4.71%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-148. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	b	b	1.9373E+18 $\pm$ 3.05%	1.9452E+18 $\pm$ 3.04%	
300.38	b	7.0119E+15 $\pm$ 19.43%	4.3359E+15 $\pm$ 25.00%	1.8690E+18 $\pm$ 3.02%	1.8826E+18 $\pm$ 3.00%	
500.38	b	4.9112E+15 $\pm$ 21.41%	b	1.9350E+18 $\pm$ 2.98%	1.9494E+18 $\pm$ 2.97%	
700.38	b	5.9848E+15 $\pm$ 22.78%	3.9381E+15 $\pm$ 23.21%	1.7550E+18 $\pm$ 3.13%	1.7655E+18 $\pm$ 3.11%	
935.19	b	2.9109E+15 $\pm$ 23.33%	1.9189E+15 $\pm$ 24.56%	1.4864E+18 $\pm$ 2.95%	1.4920E+18 $\pm$ 2.94%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-149. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-4 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	9.7345E+14 $\pm$ 23.22%	3.5673E+15 $\pm$ 13.55%	2.6710E+15 $\pm$ 16.66%	2.5925E+18 $\pm$ 2.25%	2.5997E+18 $\pm$ 2.24%	2.6633E+03
300.38	3.5156E+15 $\pm$ 14.42%	7.0389E+15 $\pm$ 11.23%	4.8737E+15 $\pm$ 11.91%	2.4583E+18 $\pm$ 2.23%	2.4737E+18 $\pm$ 2.22%	6.9925E+02
500.38	3.4752E+15 $\pm$ 13.92%	6.2471E+15 $\pm$ 9.61%	5.2098E+15 $\pm$ 11.21%	2.3773E+18 $\pm$ 2.27%	2.3922E+18 $\pm$ 2.26%	6.8407E+02
700.38	2.0852E+15 $\pm$ 17.05%	5.8112E+15 $\pm$ 12.54%	3.5004E+15 $\pm$ 13.43%	2.2290E+18 $\pm$ 2.34%	2.2404E+18 $\pm$ 2.33%	1.0690E+03
900.38	1.7688E+15 $\pm$ 20.31%	3.4659E+15 $\pm$ 15.32%	3.7059E+15 $\pm$ 14.08%	2.2177E+18 $\pm$ 2.37%	2.2267E+18 $\pm$ 2.36%	1.2538E+03
1150.38	1.4588E+15 $\pm$ 19.43%	3.5240E+15 $\pm$ 12.30%	2.3808E+15 $\pm$ 13.81%	2.0975E+18 $\pm$ 2.17%	2.1049E+18 $\pm$ 2.17%	1.4378E+03
1450.38	6.2979E+14 $\pm$ 25.56%	1.5058E+15 $\pm$ 18.11%	1.5575E+15 $\pm$ 15.43%	1.5925E+18 $\pm$ 2.50%	1.5962E+18 $\pm$ 2.49%	2.5286E+03
1750.38	b	1.1451E+15 $\pm$ 24.80%	8.7317E+14 $\pm$ 21.67%	9.3462E+17 $\pm$ 3.20%	9.3690E+17 $\pm$ 3.19%	
2135.19	3.1598E+14 $\pm$ 25.14%	7.3794E+14 $\pm$ 23.47%	5.6669E+14 $\pm$ 23.00%	3.7243E+17 $\pm$ 3.88%	3.7405E+17 $\pm$ 3.86%	1.1786E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-150. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-4 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	1.2967E+15 $\pm$ 26.74%	2.8510E+15 $\pm$ 17.24%	2.1993E+15 $\pm$ 18.68%	2.4453E+18 $\pm$ 2.45%	2.4517E+18 $\pm$ 2.44%	1.8859E+03
300.38	3.0612E+15 $\pm$ 16.39%	6.5154E+15 $\pm$ 11.92%	3.1940E+15 $\pm$ 14.95%	2.3332E+18 $\pm$ 2.47%	2.3460E+18 $\pm$ 2.46%	7.6219E+02
500.38	2.7541E+15 $\pm$ 16.78%	7.5774E+15 $\pm$ 10.92%	5.8537E+15 $\pm$ 13.09%	2.2592E+18 $\pm$ 2.46%	2.2754E+18 $\pm$ 2.44%	8.2031E+02
700.38	2.5113E+15 $\pm$ 20.49%	5.6339E+15 $\pm$ 14.29%	3.0218E+15 $\pm$ 17.21%	2.1090E+18 $\pm$ 2.62%	2.1202E+18 $\pm$ 2.61%	8.3982E+02
900.38	1.4197E+15 $\pm$ 23.02%	3.4045E+15 $\pm$ 16.41%	3.5819E+15 $\pm$ 16.47%	2.0475E+18 $\pm$ 2.62%	2.0559E+18 $\pm$ 2.61%	1.4422E+03
1150.38	1.3081E+15 $\pm$ 21.94%	3.3661E+15 $\pm$ 14.95%	2.3542E+15 $\pm$ 15.45%	2.1065E+18 $\pm$ 2.37%	2.1135E+18 $\pm$ 2.36%	1.6103E+03
1450.38	b	1.9305E+15 $\pm$ 20.65%	2.0868E+15 $\pm$ 18.98%	1.6032E+18 $\pm$ 2.70%	1.6079E+18 $\pm$ 2.70%	
1750.38	a	9.2513E+14 $\pm$ 29.35%	8.6631E+14 $\pm$ 23.67%	9.0441E+17 $\pm$ 3.36%	9.0625E+17 $\pm$ 3.35%	
2135.19	b	5.6776E+14 $\pm$ 21.36%	4.7724E+14 $\pm$ 24.53%	3.7987E+17 $\pm$ 4.19%	3.8122E+17 $\pm$ 4.18%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-151. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-4 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	$2.1312\text{E}+15 \pm 25.07\%$	$2.1361\text{E}+15 \pm 23.98\%$	$2.1837\text{E}+18 \pm 2.90\%$	$2.1890\text{E}+18 \pm 2.89\%$	
300.38	$2.5793\text{E}+15 \pm 19.82\%$	$6.3384\text{E}+15 \pm 16.51\%$	$3.8663\text{E}+15 \pm 19.02\%$	$2.1167\text{E}+18 \pm 2.99\%$	$2.1295\text{E}+18 \pm 2.97\%$	8.2068E+02
500.38	$2.7444\text{E}+15 \pm 20.31\%$	$9.4712\text{E}+15 \pm 13.46\%$	$5.5158\text{E}+15 \pm 17.05\%$	$1.9767\text{E}+18 \pm 2.99\%$	$1.9944\text{E}+18 \pm 2.97\%$	7.2026E+02
700.38	$2.1394\text{E}+15 \pm 28.48\%$	$5.9136\text{E}+15 \pm 18.43\%$	$3.4466\text{E}+15 \pm 19.46\%$	$1.8730\text{E}+18 \pm 2.99\%$	$1.8845\text{E}+18 \pm 2.97\%$	8.7547E+02
900.38	b	$5.1767\text{E}+15 \pm 18.53\%$	$3.2846\text{E}+15 \pm 22.20\%$	$1.7519\text{E}+18 \pm 3.07\%$	$1.7616\text{E}+18 \pm 3.05\%$	
1150.38	$1.1726\text{E}+15 \pm 29.47\%$	$3.8651\text{E}+15 \pm 20.87\%$	$2.4812\text{E}+15 \pm 18.86\%$	$1.9842\text{E}+18 \pm 2.68\%$	$1.9917\text{E}+18 \pm 2.67\%$	1.6922E+03
1450.38	b	$1.3450\text{E}+15 \pm 24.69\%$	$1.7267\text{E}+15 \pm 25.04\%$	$1.5851\text{E}+18 \pm 3.07\%$	$1.5890\text{E}+18 \pm 3.07\%$	
1750.38	a	b	$1.0226\text{E}+15 \pm 26.97\%$	$9.3933\text{E}+17 \pm 3.85\%$	$9.4143\text{E}+17 \pm 3.84\%$	
2135.19	b	$6.5105\text{E}+14 \pm 26.26\%$	b	$3.8258\text{E}+17 \pm 4.73\%$	$3.8410\text{E}+17 \pm 4.71\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-152. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-4 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
100.19	b	$1.4576\text{E}+15 \pm 27.33\%$	$3.1245\text{E}+15 \pm 28.46\%$	$1.7921\text{E}+18 \pm 3.20\%$	$1.7978\text{E}+18 \pm 3.19\%$	
300.38	$2.7724\text{E}+15 \pm 25.05\%$	$7.0317\text{E}+15 \pm 23.31\%$	$3.9175\text{E}+15 \pm 20.59\%$	$1.7335\text{E}+18 \pm 3.19\%$	$1.7472\text{E}+18 \pm 3.17\%$	6.2528E+02
500.38	$2.7772\text{E}+15 \pm 22.86\%$	$7.6348\text{E}+15 \pm 16.21\%$	$5.5857\text{E}+15 \pm 20.69\%$	$1.6994\text{E}+18 \pm 3.28\%$	$1.7154\text{E}+18 \pm 3.25\%$	6.1193E+02
700.38	b	$4.4936\text{E}+15 \pm 18.07\%$	$3.2161\text{E}+15 \pm 22.05\%$	$1.5681\text{E}+18 \pm 3.38\%$	$1.5781\text{E}+18 \pm 3.36\%$	
935.19	b	$5.0152\text{E}+15 \pm 23.57\%$	$2.4182\text{E}+15 \pm 24.08\%$	$1.4338\text{E}+18 \pm 2.93\%$	$1.4427\text{E}+18 \pm 2.91\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-153. Four-group Neutron Spectrum (m^2s^{-1}) in the Cold Source CS-1 Inner Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-111.63	3.8723E+16 $\pm$ 5.68%	1.7094E+17 $\pm$ 3.15%	3.1081E+17 $\pm$ 2.37%	1.8567E+19 $\pm$ 0.39%	1.9088E+19 $\pm$ 0.39%	4.7948E+02
50.00	1.2593E+16 $\pm$ 12.40%	5.2810E+16 $\pm$ 5.95%	9.2705E+16 $\pm$ 4.83%	1.1172E+19 $\pm$ 0.46%	1.1330E+19 $\pm$ 0.46%	8.8711E+02
175.00	7.5048E+15 $\pm$ 12.56%	3.0379E+16 $\pm$ 6.51%	5.0188E+16 $\pm$ 5.59%	8.0843E+18 $\pm$ 0.46%	8.1724E+18 $\pm$ 0.46%	1.0772E+03
325.00	5.0855E+15 $\pm$ 12.32%	1.9951E+16 $\pm$ 7.83%	2.9259E+16 $\pm$ 6.27%	6.2855E+18 $\pm$ 0.50%	6.3398E+18 $\pm$ 0.49%	1.2360E+03
500.00	3.0791E+15 $\pm$ 12.52%	1.3568E+16 $\pm$ 8.64%	2.1260E+16 $\pm$ 8.31%	4.7249E+18 $\pm$ 0.50%	4.7628E+18 $\pm$ 0.50%	1.5345E+03
700.00	2.5496E+15 $\pm$ 19.51%	1.0488E+16 $\pm$ 10.31%	1.3881E+16 $\pm$ 8.42%	3.3610E+18 $\pm$ 0.55%	3.3879E+18 $\pm$ 0.55%	1.3183E+03
900.00	1.3264E+15 $\pm$ 13.83%	5.1992E+15 $\pm$ 9.30%	9.0376E+15 $\pm$ 9.43%	2.2615E+18 $\pm$ 0.63%	2.2770E+18 $\pm$ 0.62%	1.7050E+03
1200.00	1.5722E+15 $\pm$ 16.45%	8.1760E+15 $\pm$ 12.23%	1.3687E+16 $\pm$ 13.07%	2.8402E+18 $\pm$ 0.68%	2.8636E+18 $\pm$ 0.68%	1.8066E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-154. Four-group Neutron Spectrum (m^2s^{-1}) in the Cold Source CS-1 Outer Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-125.35	3.8870E+16 $\pm$ 5.12%	1.7070E+17 $\pm$ 2.62%	3.1120E+17 $\pm$ 2.00%	1.8405E+19 $\pm$ 0.36%	1.8926E+19 $\pm$ 0.36%	4.7351E+02
50.00	1.0112E+16 $\pm$ 10.14%	5.4222E+16 $\pm$ 5.48%	8.8571E+16 $\pm$ 4.45%	1.1071E+19 $\pm$ 0.44%	1.1224E+19 $\pm$ 0.43%	1.0949E+03
175.00	7.3324E+15 $\pm$ 11.01%	2.8551E+16 $\pm$ 5.72%	4.7618E+16 $\pm$ 5.06%	8.0045E+18 $\pm$ 0.44%	8.0881E+18 $\pm$ 0.44%	1.0917E+03
325.00	4.1477E+15 $\pm$ 14.27%	1.6796E+16 $\pm$ 6.24%	2.7837E+16 $\pm$ 5.79%	6.1578E+18 $\pm$ 0.48%	6.2065E+18 $\pm$ 0.48%	1.4846E+03
500.00	2.7305E+15 $\pm$ 11.19%	1.1430E+16 $\pm$ 7.30%	1.8371E+16 $\pm$ 7.08%	4.6534E+18 $\pm$ 0.48%	4.6859E+18 $\pm$ 0.48%	1.7042E+03
700.00	2.2239E+15 $\pm$ 16.74%	9.7713E+15 $\pm$ 8.16%	1.2063E+16 $\pm$ 7.61%	3.2890E+18 $\pm$ 0.54%	3.3131E+18 $\pm$ 0.54%	1.4789E+03
900.00	1.1849E+15 $\pm$ 14.37%	5.0187E+15 $\pm$ 8.71%	9.6719E+15 $\pm$ 9.57%	2.2032E+18 $\pm$ 0.61%	2.2191E+18 $\pm$ 0.61%	1.8594E+03
1200.00	1.3827E+15 $\pm$ 17.85%	6.4704E+15 $\pm$ 11.12%	8.8184E+15 $\pm$ 10.80%	2.6431E+18 $\pm$ 0.69%	2.6598E+18 $\pm$ 0.69%	1.9116E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-155. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-1 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-140.10	5.1305E+16 ± 4.73%	2.1813E+17 ± 1.98%	4.1025E+17 ± 1.69%	2.0994E+19 ± 0.35%	2.1674E+19 ± 0.34%	4.0920E+02
50.00	9.2495E+15 ± 8.42%	3.5600E+16 ± 5.79%	5.9035E+16 ± 4.70%	1.1465E+19 ± 0.55%	1.1569E+19 ± 0.54%	1.2395E+03
175.00	5.9718E+15 ± 8.18%	2.0974E+16 ± 5.87%	3.1913E+16 ± 6.36%	8.3090E+18 ± 0.54%	8.3678E+18 ± 0.54%	1.3914E+03
325.00	3.8912E+15 ± 13.83%	1.3106E+16 ± 7.54%	1.8798E+16 ± 6.57%	6.2657E+18 ± 0.61%	6.3015E+18 ± 0.61%	1.6102E+03
500.00	2.3316E+15 ± 11.48%	7.4703E+15 ± 6.14%	1.2070E+16 ± 10.57%	4.5660E+18 ± 0.61%	4.5879E+18 ± 0.60%	1.9583E+03
700.00	1.5829E+15 ± 8.93%	5.8714E+15 ± 7.90%	7.0349E+15 ± 7.12%	3.1469E+18 ± 0.70%	3.1614E+18 ± 0.70%	1.9880E+03
900.00	1.2654E+15 ± 12.40%	4.1683E+15 ± 9.22%	5.7491E+15 ± 8.55%	1.9660E+18 ± 0.83%	1.9772E+18 ± 0.83%	1.5537E+03
1200.00	1.0880E+15 ± 22.33%	3.6453E+15 ± 12.27%	4.5684E+15 ± 11.08%	1.9936E+18 ± 0.95%	2.0029E+18 ± 0.95%	1.8323E+03

Table D-156. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-1 Very Cold Guide Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
18.25	b	1.8211E+16 ± 20.25%	4.0186E+16 ± 27.43%	7.5385E+18 ± 1.86%	7.6047E+18 ± 1.85%	
125.00	7.0351E+15 ± 25.10%	1.7697E+16 ± 14.20%	3.4667E+16 ± 16.58%	6.7858E+18 ± 1.12%	6.8452E+18 ± 1.10%	9.6456E+02
275.00	4.9466E+15 ± 26.34%	2.2686E+16 ± 24.02%	2.1952E+16 ± 16.60%	5.5259E+18 ± 1.21%	5.5755E+18 ± 1.20%	1.1171E+03
450.00	2.3329E+15 ± 25.13%	1.1556E+16 ± 27.00%	1.7679E+16 ± 28.38%	4.1355E+18 ± 1.22%	4.1671E+18 ± 1.21%	1.7727E+03
650.00	b	5.2404E+15 ± 21.92%	9.7655E+15 ± 22.04%	2.8621E+18 ± 1.48%	2.8800E+18 ± 1.47%	
1075.00	5.3083E+14 ± 24.60%	b	b	1.5236E+18 ± 1.55%	1.5366E+18 ± 1.56%	2.8702E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-157. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-1 Liquid D_2 Feed Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
125.00	b	$1.9032\text{E}+16 \pm 21.32\%$	$3.9753\text{E}+16 \pm 26.28\%$	$7.4351\text{E}+18 \pm 1.52\%$	$7.4987\text{E}+18 \pm 1.52\%$	
275.00	b	b	b	$5.6543\text{E}+18 \pm 2.11\%$	$5.6960\text{E}+18 \pm 2.11\%$	
450.00	b	b	b	$4.0959\text{E}+18 \pm 2.22\%$	$4.1239\text{E}+18 \pm 2.22\%$	
650.00	b	b	b	$2.6844\text{E}+18 \pm 2.45\%$	$2.6998\text{E}+18 \pm 2.43\%$	
1075.00	b	$4.4765\text{E}+15 \pm 29.12\%$	b	$1.3687\text{E}+18 \pm 2.47\%$	$1.3781\text{E}+18 \pm 2.47\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-158. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-1 D_2 Return Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
125.00	b	$2.7012\text{E}+16 \pm 19.31\%$	$3.9139\text{E}+16 \pm 14.69\%$	$7.6072\text{E}+18 \pm 1.12\%$	$7.6790\text{E}+18 \pm 1.11\%$	
275.00	b	$2.5754\text{E}+15 \pm 28.69\%$	b	$5.6544\text{E}+17 \pm 1.49\%$	$5.7092\text{E}+17 \pm 1.49\%$	
450.00	b	$1.0295\text{E}+15 \pm 20.60\%$	b	$4.1863\text{E}+17 \pm 1.53\%$	$4.2290\text{E}+17 \pm 1.56\%$	
650.00	b	b	$9.1053\text{E}+14 \pm 28.18\%$	$2.9446\text{E}+17 \pm 1.91\%$	$2.9605\text{E}+17 \pm 1.90\%$	
1075.00	$3.7706\text{E}+14 \pm 28.95\%$	$4.6219\text{E}+15 \pm 23.06\%$	$4.4076\text{E}+15 \pm 24.51\%$	$1.4370\text{E}+18 \pm 1.90\%$	$1.4464\text{E}+18 \pm 1.90\%$	$3.8110\text{E}+03$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-159. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-2 Inner Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-111.63	3.5372E+16	± 6.23%	1.6514E+17	± 3.08%	3.1461E+17	± 2.31%	1.7600E+19	± 0.39%	1.8115E+19	± 0.39%	4.9758E+02
50.00	1.1206E+16	± 13.55%	5.6349E+16	± 6.03%	1.0756E+17	± 4.77%	1.0698E+19	± 0.46%	1.0873E+19	± 0.46%	9.5462E+02
175.00	6.2224E+15	± 10.98%	2.7755E+16	± 6.67%	5.1436E+16	± 5.47%	7.7749E+18	± 0.46%	7.8603E+18	± 0.46%	1.2495E+03
325.00	4.5180E+15	± 11.97%	1.9868E+16	± 7.56%	2.9453E+16	± 6.74%	6.0736E+18	± 0.50%	6.1275E+18	± 0.50%	1.3443E+03
500.00	4.1463E+15	± 14.51%	1.1974E+16	± 7.24%	2.0680E+16	± 6.68%	4.6145E+18	± 0.50%	4.6513E+18	± 0.50%	1.1129E+03
700.00	2.9152E+15	± 20.10%	8.8473E+15	± 8.60%	1.4743E+16	± 8.27%	3.2548E+18	± 0.56%	3.2813E+18	± 0.56%	1.1165E+03
900.00	1.3879E+15	± 12.21%	6.3827E+15	± 14.46%	9.8777E+15	± 8.63%	2.2019E+18	± 0.64%	2.2196E+18	± 0.63%	1.5865E+03
1200.00	2.9223E+15	± 25.63%	7.6182E+15	± 11.00%	1.3634E+16	± 12.36%	2.7744E+18	± 0.69%	2.7986E+18	± 0.69%	9.4940E+02

Table D-160. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-2 Outer Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
-125.35	3.3831E+16	± 5.26%	1.6993E+17	± 2.65%	3.1800E+17	± 1.97%	1.7435E+19	± 0.36%	1.7957E+19	± 0.36%	5.1534E+02
50.00	1.1796E+16	± 11.54%	4.6618E+16	± 5.57%	9.9344E+16	± 4.04%	1.0583E+19	± 0.44%	1.0740E+19	± 0.44%	8.9711E+02
175.00	5.5450E+15	± 9.67%	2.6116E+16	± 5.82%	5.3414E+16	± 5.35%	7.6909E+18	± 0.45%	7.7760E+18	± 0.45%	1.3870E+03
325.00	3.9953E+15	± 11.26%	1.7740E+16	± 6.89%	2.8253E+16	± 6.09%	5.9751E+18	± 0.49%	6.0250E+18	± 0.49%	1.4955E+03
500.00	2.9056E+15	± 12.40%	1.3068E+16	± 8.13%	1.9822E+16	± 6.02%	4.5180E+18	± 0.49%	4.5538E+18	± 0.49%	1.5549E+03
700.00	2.3681E+15	± 15.47%	8.9049E+15	± 9.00%	1.2960E+16	± 8.03%	3.1722E+18	± 0.55%	3.1964E+18	± 0.55%	1.3395E+03
900.00	1.6048E+15	± 14.35%	5.5480E+15	± 8.84%	8.5763E+15	± 9.04%	2.1240E+18	± 0.63%	2.1398E+18	± 0.62%	1.3235E+03
1200.00	1.7482E+15	± 16.03%	7.8175E+15	± 11.60%	1.2745E+16	± 10.56%	2.5899E+18	± 0.70%	2.6122E+18	± 0.70%	1.4815E+03

Table D-161. Four-group Neutron Spectrum (m^2s^{-1}) in the Cold Source CS-2 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-140.10	4.8231E+16 $\pm$ 4.20%	2.2546E+17 $\pm$ 2.20%	4.1921E+17 $\pm$ 1.66%	1.9947E+19 $\pm$ 0.35%	2.0640E+19 $\pm$ 0.34%	4.1358E+02
50.00	8.3214E+15 $\pm$ 8.07%	3.4600E+16 $\pm$ 5.88%	7.2974E+16 $\pm$ 5.21%	1.1067E+19 $\pm$ 0.55%	1.1182E+19 $\pm$ 0.55%	1.3299E+03
175.00	6.3632E+15 $\pm$ 10.74%	1.9701E+16 $\pm$ 5.99%	3.1323E+16 $\pm$ 6.14%	8.0415E+18 $\pm$ 0.54%	8.0989E+18 $\pm$ 0.54%	1.2638E+03
325.00	3.4137E+15 $\pm$ 8.54%	1.2918E+16 $\pm$ 6.42%	1.7180E+16 $\pm$ 6.51%	6.0588E+18 $\pm$ 0.61%	6.0923E+18 $\pm$ 0.61%	1.7748E+03
500.00	2.3838E+15 $\pm$ 10.70%	7.6633E+15 $\pm$ 6.18%	1.3558E+16 $\pm$ 8.77%	4.4122E+18 $\pm$ 0.62%	4.4358E+18 $\pm$ 0.62%	1.8510E+03
700.00	2.0194E+15 $\pm$ 14.21%	5.3744E+15 $\pm$ 6.91%	8.2769E+15 $\pm$ 7.81%	3.0263E+18 $\pm$ 0.71%	3.0420E+18 $\pm$ 0.71%	1.4986E+03
900.00	1.5971E+15 $\pm$ 10.64%	3.8147E+15 $\pm$ 8.20%	4.8045E+15 $\pm$ 9.51%	1.8894E+18 $\pm$ 0.83%	1.8996E+18 $\pm$ 0.83%	1.1830E+03
1200.00	1.5111E+15 $\pm$ 28.89%	3.2622E+15 $\pm$ 16.46%	4.4452E+15 $\pm$ 11.55%	1.9099E+18 $\pm$ 0.96%	1.9192E+18 $\pm$ 0.96%	1.2639E+03

Table D-162. Four-group Neutron Spectrum (m^2s^{-1}) in the Cold Source CS-2 Very Cold Guide Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
18.25	b	b	4.8781E+16 $\pm$ 22.35%	8.0909E+18 $\pm$ 1.85%	8.1874E+18 $\pm$ 1.84%	
125.00	b	3.2688E+16 $\pm$ 18.58%	5.0006E+16 $\pm$ 18.17%	7.0617E+18 $\pm$ 1.14%	7.1513E+18 $\pm$ 1.14%	
275.00	3.1412E+15 $\pm$ 20.70%	1.3470E+16 $\pm$ 17.06%	2.3749E+16 $\pm$ 18.92%	5.4314E+18 $\pm$ 1.23%	5.4717E+18 $\pm$ 1.22%	1.7290E+03
450.00	1.2810E+15 $\pm$ 21.94%	1.1527E+16 $\pm$ 21.86%	2.2371E+16 $\pm$ 23.61%	3.9524E+18 $\pm$ 1.26%	3.9876E+18 $\pm$ 1.26%	3.0855E+03
650.00	1.1322E+15 $\pm$ 23.54%	b	1.2806E+16 $\pm$ 28.32%	2.7497E+18 $\pm$ 1.49%	2.7698E+18 $\pm$ 1.48%	2.4287E+03
1075.00	b	2.6413E+15 $\pm$ 26.05%	5.6908E+15 $\pm$ 22.23%	1.5764E+18 $\pm$ 1.56%	1.5859E+18 $\pm$ 1.54%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-163. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-2 Liquid D_2 Feed Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
125.00	b	b	$3.5379\text{E}+16 \pm 23.56\%$	$6.7228\text{E}+18 \pm 1.59\%$	$6.7804\text{E}+18 \pm 1.59\%$	
275.00	b	$9.1326\text{E}+15 \pm 24.74\%$	$2.2827\text{E}+16 \pm 27.21\%$	$5.2720\text{E}+18 \pm 2.10\%$	$5.3057\text{E}+18 \pm 2.08\%$	
450.00	b	b	b	$3.9467\text{E}+18 \pm 2.13\%$	$3.9675\text{E}+18 \pm 2.13\%$	
650.00	b	$3.0662\text{E}+15 \pm 22.41\%$	b	$2.8206\text{E}+18 \pm 2.61\%$	$2.8328\text{E}+18 \pm 2.60\%$	
1075.00	b	$1.6661\text{E}+15 \pm 19.61\%$	$3.0680\text{E}+15 \pm 29.51\%$	$1.3216\text{E}+18 \pm 2.78\%$	$1.3267\text{E}+18 \pm 2.77\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-164. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Source CS-2 D_2 Return Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 ($\text{E}+05 - 17.0\text{E}+06$ eV)	Group 2 ($100.0 - \text{E}+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
125.00	b	$2.1944\text{E}+16 \pm 16.41\%$	$4.7825\text{E}+16 \pm 18.78\%$	$6.7891\text{E}+18 \pm 1.16\%$	$6.8670\text{E}+18 \pm 1.15\%$	
275.00	b	$1.4436\text{E}+16 \pm 26.21\%$	$3.7458\text{E}+16 \pm 26.76\%$	$5.3123\text{E}+18 \pm 1.54\%$	$5.3685\text{E}+18 \pm 1.54\%$	
450.00	b	$7.9691\text{E}+15 \pm 23.37\%$	$1.2157\text{E}+16 \pm 25.57\%$	$3.9106\text{E}+18 \pm 1.55\%$	$3.9333\text{E}+18 \pm 1.54\%$	
650.00	b	$4.8484\text{E}+15 \pm 21.13\%$	b	$2.7929\text{E}+18 \pm 1.85\%$	$2.8076\text{E}+18 \pm 1.84\%$	
1075.00	b	$2.7452\text{E}+15 \pm 27.71\%$	b	$1.3329\text{E}+18 \pm 2.01\%$	$1.3419\text{E}+18 \pm 1.99\%$	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-165. Four-group Neutron Spectrum (m^2s^{-1}) in the Cold Source Miscellaneous Components. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
CS-1 Shell	2.1681E+16 ± 5.31%	9.9125E+16 ± 2.75%	1.7346E+17 ± 2.11%	1.4103E+19 ± 0.34%	1.4397E+19 ± 0.33%	6.5046E+02
CS-1 Cavity Shell	9.8925E+15 ± 15.57%	3.0433E+16 ± 13.83%	5.9506E+16 ± 10.73%	8.6784E+18 ± 0.82%	8.7782E+18 ± 0.82%	8.7727E+02
CS-1 Moderator LD ₂	2.1710E+16 ± 4.91%	1.0017E+17 ± 2.44%	1.8246E+17 ± 1.80%	1.6955E+19 ± 0.35%	1.7259E+19 ± 0.35%	7.8096E+02
CS-1 Feed Line LD ₂	b	9.7626E+15 ± 15.97%	1.5287E+16 ± 15.41%	3.6911E+18 ± 0.89%	3.7210E+18 ± 0.89%	
CS-1 Moderator D ₂	1.1034E+16 ± 12.22%	4.7028E+16 ± 5.77%	8.2964E+16 ± 4.70%	1.1378E+19 ± 0.47%	1.1519E+19 ± 0.47%	1.0312E+03
CS-1 Return Line D ₂	2.6769E+15 ± 17.40%	1.2858E+16 ± 13.32%	1.5447E+16 ± 12.18%	3.8401E+18 ± 0.67%	3.8710E+18 ± 0.66%	1.4345E+03
CS-1 Tie Rod 1	b	7.7637E+15 ± 19.42%	b	4.0935E+18 ± 1.79%	4.1340E+18 ± 1.80%	
CS-1 Tie Rod 2	b	b	1.9390E+16 ± 24.36%	4.4261E+18 ± 1.83%	4.4575E+18 ± 1.83%	
CS-1 Window	6.1844E+14 ± 15.37%	2.7606E+15 ± 8.31%	3.9731E+15 ± 7.35%	8.8224E+17 ± 0.65%	8.8959E+17 ± 0.64%	1.4265E+03
CS-2 Shell	2.1306E+16 ± 5.88%	9.9442E+16 ± 2.86%	1.8286E+17 ± 2.04%	1.3534E+19 ± 0.34%	1.3838E+19 ± 0.34%	6.3523E+02
CS-2 Cavity Shell	9.5806E+15 ± 15.55%	3.1699E+16 ± 9.00%	5.8130E+16 ± 7.49%	8.4450E+18 ± 0.82%	8.5444E+18 ± 0.82%	8.8146E+02
CS-2 Moderator LD ₂	2.0720E+16 ± 5.09%	1.0332E+17 ± 2.42%	1.9554E+17 ± 1.73%	1.6165E+19 ± 0.36%	1.6485E+19 ± 0.35%	7.8017E+02
CS-2 Feed Line LD ₂	2.6628E+15 ± 27.15%	8.6624E+15 ± 22.65%	1.4918E+16 ± 17.26%	3.5691E+18 ± 0.91%	3.5953E+18 ± 0.91%	1.3403E+03
CS-2 Moderator D ₂	1.1590E+16 ± 12.30%	4.8165E+16 ± 5.92%	8.5404E+16 ± 4.71%	1.1074E+19 ± 0.48%	1.1219E+19 ± 0.47%	9.5549E+02
CS-2 Return Line D ₂	3.2030E+15 ± 23.14%	8.9572E+15 ± 12.02%	1.6811E+16 ± 13.42%	3.5422E+18 ± 0.68%	3.5711E+18 ± 0.67%	1.1059E+03
CS-2 Tie Rod 1	b	b	2.9923E+16 ± 22.87%	4.2086E+18 ± 1.78%	4.2570E+18 ± 1.77%	
CS-2 Tie Rod 2	b	1.0182E+16 ± 25.66%	b	3.9787E+18 ± 2.14%	4.0074E+18 ± 2.13%	
CS-2 Window	7.5061E+14 ± 15.00%	2.7467E+15 ± 8.67%	4.3545E+15 ± 8.00%	8.4779E+17 ± 0.62%	8.5565E+17 ± 0.62%	1.1295E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-166. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
425.00	$1.2884\text{E}+16 \pm 22.47\%$	$3.5408\text{E}+16 \pm 9.34\%$	$5.4918\text{E}+16 \pm 10.09\%$	$1.2772\text{E}+19 \pm 0.83\%$	$1.2875\text{E}+19 \pm 0.82\%$	$9.9129\text{E}+02$
500.00	$6.9605\text{E}+15 \pm 12.16\%$	$1.8028\text{E}+16 \pm 9.86\%$	$1.8029\text{E}+16 \pm 8.92\%$	$7.1503\text{E}+18 \pm 0.95\%$	$7.1933\text{E}+18 \pm 0.95\%$	$1.0273\text{E}+03$
600.00	$6.4764\text{E}+15 \pm 9.38\%$	$1.6377\text{E}+16 \pm 8.77\%$	$1.9242\text{E}+16 \pm 14.54\%$	$6.2416\text{E}+18 \pm 1.02\%$	$6.2837\text{E}+18 \pm 1.02\%$	$9.6375\text{E}+02$
700.00	$5.5172\text{E}+15 \pm 8.76\%$	$1.3973\text{E}+16 \pm 5.73\%$	$1.0160\text{E}+16 \pm 10.92\%$	$5.3430\text{E}+18 \pm 1.10\%$	$5.3727\text{E}+18 \pm 1.09\%$	$9.6842\text{E}+02$
825.00	$4.5816\text{E}+15 \pm 7.48\%$	$1.1507\text{E}+16 \pm 8.44\%$	$9.6116\text{E}+15 \pm 11.22\%$	$4.2688\text{E}+18 \pm 1.10\%$	$4.2945\text{E}+18 \pm 1.10\%$	$9.3172\text{E}+02$
975.00	$2.1975\text{E}+15 \pm 11.65\%$	$6.4967\text{E}+15 \pm 7.30\%$	$5.2525\text{E}+15 \pm 12.24\%$	$3.2118\text{E}+18 \pm 1.26\%$	$3.2257\text{E}+18 \pm 1.25\%$	$1.4615\text{E}+03$
1125.00	$1.1981\text{E}+15 \pm 15.96\%$	$4.0387\text{E}+15 \pm 23.77\%$	$2.8946\text{E}+15 \pm 12.83\%$	$2.3745\text{E}+18 \pm 1.42\%$	$2.3827\text{E}+18 \pm 1.41\%$	$1.9819\text{E}+03$
1300.00	$5.6736\text{E}+14 \pm 22.55\%$	$1.7381\text{E}+15 \pm 11.51\%$	$1.9764\text{E}+15 \pm 15.62\%$	$1.6331\text{E}+18 \pm 1.59\%$	$1.6374\text{E}+18 \pm 1.59\%$	$2.8785\text{E}+03$
1500.00	$6.1780\text{E}+14 \pm 25.68\%$	$1.3474\text{E}+15 \pm 13.71\%$	$1.1225\text{E}+15 \pm 13.66\%$	$9.8494\text{E}+17 \pm 1.94\%$	$9.8803\text{E}+17 \pm 1.94\%$	$1.5943\text{E}+03$
1700.00	$2.3656\text{E}+14 \pm 25.74\%$	$1.0861\text{E}+15 \pm 15.86\%$	$8.7067\text{E}+14 \pm 17.53\%$	$5.7933\text{E}+17 \pm 2.49\%$	$5.8152\text{E}+17 \pm 2.48\%$	$2.4490\text{E}+03$
1900.00	$3.0090\text{E}+14 \pm 26.68\%$	$5.0165\text{E}+14 \pm 18.82\%$	$4.9278\text{E}+14 \pm 19.83\%$	$2.4203\text{E}+17 \pm 3.23\%$	$2.4333\text{E}+17 \pm 3.22\%$	$8.0436\text{E}+02$

Table D-167. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-1 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($\text{E}+05$ - $17.0\text{E}+06$ eV)	Group 2 (100.0 - $\text{E}+05$ eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
425.00	$1.0767\text{E}+16 \pm 13.74\%$	$3.6426\text{E}+16 \pm 9.76\%$	$5.1351\text{E}+16 \pm 9.76\%$	$1.3016\text{E}+19 \pm 0.83\%$	$1.3115\text{E}+19 \pm 0.82\%$	$1.2089\text{E}+03$
500.00	$6.7179\text{E}+15 \pm 8.65\%$	$1.7229\text{E}+16 \pm 7.46\%$	$2.2316\text{E}+16 \pm 15.65\%$	$7.0850\text{E}+18 \pm 0.96\%$	$7.1312\text{E}+18 \pm 0.96\%$	$1.0546\text{E}+03$
600.00	$7.0334\text{E}+15 \pm 8.55\%$	$1.5172\text{E}+16 \pm 5.54\%$	$1.4632\text{E}+16 \pm 9.30\%$	$6.2210\text{E}+18 \pm 1.03\%$	$6.2578\text{E}+18 \pm 1.03\%$	$8.8449\text{E}+02$
700.00	$5.9748\text{E}+15 \pm 7.93\%$	$1.4902\text{E}+16 \pm 5.63\%$	$1.1848\text{E}+16 \pm 12.63\%$	$5.3260\text{E}+18 \pm 1.11\%$	$5.3587\text{E}+18 \pm 1.10\%$	$8.9141\text{E}+02$
825.00	$4.5592\text{E}+15 \pm 7.13\%$	$1.1544\text{E}+16 \pm 5.79\%$	$9.4054\text{E}+15 \pm 9.45\%$	$4.2858\text{E}+18 \pm 1.11\%$	$4.3113\text{E}+18 \pm 1.10\%$	$9.4004\text{E}+02$
975.00	$2.1039\text{E}+15 \pm 10.43\%$	$6.1968\text{E}+15 \pm 8.53\%$	$5.9959\text{E}+15 \pm 14.14\%$	$3.2336\text{E}+18 \pm 1.27\%$	$3.2479\text{E}+18 \pm 1.26\%$	$1.5369\text{E}+03$
1125.00	$1.2472\text{E}+15 \pm 19.33\%$	$3.1296\text{E}+15 \pm 9.52\%$	$3.2037\text{E}+15 \pm 17.49\%$	$2.3419\text{E}+18 \pm 1.44\%$	$2.3495\text{E}+18 \pm 1.43\%$	$1.8777\text{E}+03$
1300.00	$4.4826\text{E}+14 \pm 19.80\%$	$1.9458\text{E}+15 \pm 14.22\%$	$1.7535\text{E}+15 \pm 17.79\%$	$1.6267\text{E}+18 \pm 1.60\%$	$1.6309\text{E}+18 \pm 1.59\%$	$3.6289\text{E}+03$
1500.00	$3.5248\text{E}+14 \pm 19.87\%$	$1.1643\text{E}+15 \pm 12.81\%$	$9.1740\text{E}+14 \pm 13.00\%$	$9.7038\text{E}+17 \pm 1.96\%$	$9.7281\text{E}+17 \pm 1.95\%$	$2.7530\text{E}+03$
1700.00	$2.3523\text{E}+14 \pm 22.97\%$	$1.1429\text{E}+15 \pm 15.74\%$	$7.7895\text{E}+14 \pm 16.93\%$	$5.4945\text{E}+17 \pm 2.49\%$	$5.5161\text{E}+17 \pm 2.48\%$	$2.3358\text{E}+03$
1900.00	$2.2281\text{E}+14 \pm 24.36\%$	$5.0177\text{E}+14 \pm 18.64\%$	$3.9284\text{E}+14 \pm 18.98\%$	$2.2830\text{E}+17 \pm 3.22\%$	$2.2942\text{E}+17 \pm 3.21\%$	$1.0246\text{E}+03$

Table D-168. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Cold Guide Tube SCG-2 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
425.00	$1.2845E+16 \pm 15.98\%$	$3.5557E+16 \pm 9.39\%$	$5.0501E+16 \pm 9.41\%$	$1.1453E+19 \pm 0.86\%$	$1.1552E+19 \pm 0.86\%$	$8.9167E+02$
500.00	$6.3661E+15 \pm 8.33\%$	$1.6346E+16 \pm 8.33\%$	$2.0202E+16 \pm 11.96\%$	$6.3486E+18 \pm 1.01\%$	$6.3915E+18 \pm 1.00\%$	$9.9724E+02$
600.00	$5.9888E+15 \pm 8.15\%$	$1.4680E+16 \pm 5.69\%$	$1.4848E+16 \pm 11.16\%$	$5.5727E+18 \pm 1.06\%$	$5.6082E+18 \pm 1.06\%$	$9.3053E+02$
700.00	$5.7717E+15 \pm 7.53\%$	$1.3518E+16 \pm 6.04\%$	$1.0968E+16 \pm 10.38\%$	$4.7553E+18 \pm 1.15\%$	$4.7855E+18 \pm 1.14\%$	$8.2390E+02$
825.00	$4.0814E+15 \pm 8.11\%$	$9.9526E+15 \pm 5.73\%$	$9.0315E+15 \pm 12.29\%$	$3.8277E+18 \pm 1.15\%$	$3.8508E+18 \pm 1.14\%$	$9.3785E+02$
975.00	$1.9076E+15 \pm 12.31\%$	$5.6519E+15 \pm 11.21\%$	$4.4055E+15 \pm 10.10\%$	$2.8744E+18 \pm 1.32\%$	$2.8863E+18 \pm 1.32\%$	$1.5068E+03$
1125.00	$6.4506E+14 \pm 19.05\%$	$2.4927E+15 \pm 11.12\%$	$3.4630E+15 \pm 19.83\%$	$2.1030E+18 \pm 1.53\%$	$2.1096E+18 \pm 1.52\%$	$3.2601E+03$
1300.00	$5.5694E+14 \pm 19.89\%$	$1.5974E+15 \pm 12.14\%$	b	$1.4176E+18 \pm 1.68\%$	$1.4222E+18 \pm 1.67\%$	$2.5454E+03$
1500.00	$3.4164E+14 \pm 28.06\%$	$8.4676E+14 \pm 14.67\%$	$1.0320E+15 \pm 18.78\%$	$8.8353E+17 \pm 2.06\%$	$8.8575E+17 \pm 2.05\%$	$2.5861E+03$
1700.00	b	$1.0033E+15 \pm 15.13\%$	$6.4600E+14 \pm 17.00\%$	$4.7494E+17 \pm 2.60\%$	$4.7687E+17 \pm 2.59\%$	
1900.00	$2.1069E+14 \pm 28.09\%$	$5.5200E+14 \pm 19.95\%$	b	$1.9265E+17 \pm 3.63\%$	$1.9383E+17 \pm 3.61\%$	$9.1438E+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-169. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Cold Guide Tube SCG-2 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 ($E+05 - 17.0E+06$ eV)	Group 2 ($100.0 - E+05$ eV)	Group 3 ($0.625 - 100.0$ eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
425.00	$1.1492E+16 \pm 11.91\%$	$3.6421E+16 \pm 9.78\%$	$5.3429E+16 \pm 9.24\%$	$1.1634E+19 \pm 0.86\%$	$1.1736E+19 \pm 0.86\%$	$1.0124E+03$
500.00	$5.8928E+15 \pm 8.20\%$	$1.7680E+16 \pm 8.40\%$	$2.3067E+16 \pm 11.61\%$	$6.3939E+18 \pm 1.02\%$	$6.4406E+18 \pm 1.01\%$	$1.0850E+03$
600.00	$5.8417E+15 \pm 7.95\%$	$1.7208E+16 \pm 11.89\%$	$1.3674E+16 \pm 9.02\%$	$5.6229E+18 \pm 1.08\%$	$5.6596E+18 \pm 1.08\%$	$9.6255E+02$
700.00	$6.2000E+15 \pm 7.41\%$	$1.3525E+16 \pm 5.96\%$	$1.2394E+16 \pm 13.35\%$	$4.7672E+18 \pm 1.17\%$	$4.7993E+18 \pm 1.16\%$	$7.6890E+02$
825.00	$4.4740E+15 \pm 7.56\%$	$1.0211E+16 \pm 6.08\%$	$8.1756E+15 \pm 8.97\%$	$3.8443E+18 \pm 1.15\%$	$3.8672E+18 \pm 1.14\%$	$8.5927E+02$
975.00	$1.6076E+15 \pm 11.57\%$	$5.4105E+15 \pm 10.03\%$	$4.5590E+15 \pm 12.00\%$	$2.8543E+18 \pm 1.33\%$	$2.8659E+18 \pm 1.33\%$	$1.7755E+03$
1125.00	$6.0941E+14 \pm 17.27\%$	$2.7614E+15 \pm 10.88\%$	$3.7744E+15 \pm 19.37\%$	$2.1193E+18 \pm 1.54\%$	$2.1264E+18 \pm 1.53\%$	$3.4776E+03$
1300.00	$5.1657E+14 \pm 19.35\%$	$1.7811E+15 \pm 17.77\%$	$1.4981E+15 \pm 16.71\%$	$1.4136E+18 \pm 1.68\%$	$1.4174E+18 \pm 1.66\%$	$2.7365E+03$
1500.00	$3.8088E+14 \pm 27.21\%$	$8.6721E+14 \pm 15.65\%$	b	$8.7276E+17 \pm 2.08\%$	$8.7557E+17 \pm 2.08\%$	$2.2914E+03$
1700.00	$2.9902E+14 \pm 26.31\%$	$1.0069E+15 \pm 14.41\%$	$7.2200E+14 \pm 15.69\%$	$4.7388E+17 \pm 2.66\%$	$4.7591E+17 \pm 2.65\%$	$1.5848E+03$
1900.00	$2.0556E+14 \pm 24.99\%$	$6.9027E+14 \pm 20.58\%$	$4.0936E+14 \pm 24.20\%$	$1.8029E+17 \pm 3.61\%$	$1.8160E+17 \pm 3.59\%$	$8.7708E+02$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-170. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source HS-1 Graphite Shell Half Towards the Core. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from HS Centerline	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
-18.75	b	1.2955E+16 $\pm$ 19.38%	7.2813E+17 $\pm$ 5.45%	6.2298E+18 $\pm$ 2.44%	6.9754E+18 $\pm$ 2.38%	
-52.50	4.9003E+15 $\pm$ 25.66%	1.4500E+16 $\pm$ 13.35%	6.5452E+17 $\pm$ 3.21%	6.6347E+18 $\pm$ 1.50%	7.3086E+18 $\pm$ 1.49%	1.3539E+03
-82.50	4.1689E+15 $\pm$ 16.91%	1.7038E+16 $\pm$ 10.14%	5.8414E+17 $\pm$ 2.29%	7.1303E+18 $\pm$ 1.05%	7.7357E+18 $\pm$ 1.05%	1.7103E+03
-107.50	6.0013E+15 $\pm$ 18.94%	2.2403E+16 $\pm$ 9.08%	4.6615E+17 $\pm$ 2.12%	7.7759E+18 $\pm$ 0.84%	8.2704E+18 $\pm$ 0.84%	1.2957E+03
-127.50	7.4141E+15 $\pm$ 11.44%	2.6497E+16 $\pm$ 6.94%	2.9839E+17 $\pm$ 2.06%	8.5449E+18 $\pm$ 0.64%	8.8771E+18 $\pm$ 0.64%	1.1525E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-171. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source HS-1 Graphite Shell Away From the Core. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from HS Centerline	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
18.75	b	7.9760E+15 $\pm$ 17.91%	6.1088E+17 $\pm$ 5.71%	5.6707E+18 $\pm$ 2.53%	6.2926E+18 $\pm$ 2.46%	
52.50	3.2185E+15 $\pm$ 26.04%	9.1193E+15 $\pm$ 9.94%	5.6427E+17 $\pm$ 3.38%	5.3120E+18 $\pm$ 1.65%	5.8886E+18 $\pm$ 1.62%	1.6504E+03
82.50	2.7084E+15 $\pm$ 20.02%	1.0643E+16 $\pm$ 8.14%	4.5580E+17 $\pm$ 2.50%	5.1421E+18 $\pm$ 1.19%	5.6112E+18 $\pm$ 1.18%	1.8986E+03
107.50	2.5140E+15 $\pm$ 20.47%	1.0509E+16 $\pm$ 7.97%	3.3626E+17 $\pm$ 2.34%	5.1311E+18 $\pm$ 0.94%	5.4803E+18 $\pm$ 0.94%	2.0410E+03
127.50	2.7018E+15 $\pm$ 9.90%	9.7109E+15 $\pm$ 5.26%	2.0085E+17 $\pm$ 2.31%	5.2495E+18 $\pm$ 0.72%	5.4628E+18 $\pm$ 0.72%	1.9429E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-172. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source HS-1 Outer Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-116.75	8.1770E+15	± 6.43%	2.7202E+16	± 4.49%	8.2320E+16	± 2.98%	9.2937E+18	± 0.52%	9.4114E+18	± 0.52%	1.1366E+03
50.00	3.0382E+15	± 7.86%	9.7076E+15	± 4.15%	4.7047E+16	± 3.15%	5.3531E+18	± 0.56%	5.4129E+18	± 0.56%	1.7619E+03
175.00	8.2454E+15	± 4.94%	2.6937E+16	± 3.87%	6.8387E+16	± 2.71%	9.3024E+18	± 0.51%	9.4060E+18	± 0.51%	1.1282E+03
325.00	4.4211E+15	± 15.83%	1.1521E+16	± 4.26%	4.2899E+16	± 4.12%	6.1699E+18	± 0.63%	6.2288E+18	± 0.63%	1.3956E+03
475.00	2.3022E+15	± 15.80%	7.3412E+15	± 5.40%	2.3694E+16	± 4.55%	4.6380E+18	± 0.64%	4.6713E+18	± 0.63%	2.0146E+03
650.00	1.6451E+15	± 9.09%	5.4772E+15	± 5.89%	1.4492E+16	± 5.63%	3.6384E+18	± 0.70%	3.6600E+18	± 0.70%	2.2117E+03
825.00	1.3699E+15	± 7.76%	4.7378E+15	± 6.66%	9.1594E+15	± 7.42%	2.8659E+18	± 0.76%	2.8811E+18	± 0.76%	2.0920E+03

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-173. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source HS-1 Inner Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
-116.75	5.4964E+15 ±	5.56%	1.8581E+16 ±	3.85%	1.0461E+17 ±	1.82%	7.2354E+18 ±	0.46%	7.3642E+18 ±	0.46%	1.3164E+03
50.00	5.6208E+15 ±	7.24%	1.7970E+16 ±	3.63%	7.8945E+16 ±	2.51%	7.2216E+18 ±	0.50%	7.3242E+18 ±	0.50%	1.2848E+03
175.00	1.4696E+15 ±	4.42%	4.8176E+15 ±	2.88%	1.2875E+16 ±	2.70%	2.7820E+18 ±	0.46%	2.8012E+18 ±	0.46%	1.8930E+03
325.00	7.5924E+15 ±	7.73%	2.4923E+16 ±	4.44%	1.0180E+17 ±	2.79%	8.8625E+18 ±	0.55%	8.9968E+18 ±	0.54%	1.1673E+03
475.00	3.3811E+15 ±	8.11%	1.0683E+16 ±	4.38%	6.3939E+16 ±	3.14%	5.5167E+18 ±	0.59%	5.5947E+18 ±	0.59%	1.6316E+03
650.00	7.4900E+15 ±	5.93%	2.6272E+16 ±	4.59%	9.2605E+16 ±	2.86%	9.0048E+18 ±	0.54%	9.1311E+18 ±	0.54%	1.2022E+03
825.00	3.5227E+15 ±	9.16%	1.0383E+16 ±	4.16%	5.8902E+16 ±	3.12%	5.4570E+18 ±	0.58%	5.5298E+18 ±	0.58%	1.5491E+03

Table D-174. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source Miscellaneous Components. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Insulator	1.1706E+15 ± 8.15%	3.5391E+15 ± 5.41%	6.3969E+15 ± 7.86%	2.0594E+18 ± 0.80%	2.0706E+18 ± 0.80%	1.7593E+03
Helium (3 atm.)	3.4167E+14 ± 11.05%	9.7994E+14 ± 7.74%	1.6823E+15 ± 10.74%	7.0978E+17 ± 0.92%	7.1278E+17 ± 0.92%	2.0774E+03
Helium (1 atm.)	1.0893E+16 ± 5.87%	2.9749E+16 ± 4.22%	5.2308E+16 ± 2.98%	1.0443E+19 ± 0.49%	1.0536E+19 ± 0.49%	9.5867E+02
Zircaloy Inner Shell (towards core)	3.9670E+15 ± 12.86%	1.2253E+16 ± 4.87%	2.8462E+16 ± 5.69%	6.6587E+18 ± 0.70%	6.7034E+18 ± 0.69%	1.6785E+03
Zircaloy Inner Shell (away from core)	2.0055E+15 ± 10.01%	6.7904E+15 ± 5.67%	1.5307E+16 ± 5.10%	4.9592E+18 ± 0.69%	4.9833E+18 ± 0.69%	2.4728E+03
Zircaloy Middle Shell (towards core)	1.6803E+15 ± 8.48%	5.0454E+15 ± 5.79%	7.8734E+15 ± 5.75%	3.7533E+18 ± 0.77%	3.7679E+18 ± 0.77%	2.2336E+03
Zircaloy Middle Shell (away from core)	1.5463E+15 ± 7.69%	4.3647E+15 ± 6.07%	5.4850E+15 ± 8.39%	2.9098E+18 ± 0.87%	2.9212E+18 ± 0.87%	1.8817E+03
Zircaloy Outer Shell (towards core)	1.4678E+15 ± 7.22%	3.3083E+15 ± 5.59%	3.2660E+15 ± 5.86%	1.9460E+18 ± 0.92%	1.9540E+18 ± 0.91%	1.3258E+03
Zircaloy Outer Shell (away from core)	2.3739E+14 ± 10.50%	6.8544E+14 ± 7.77%	8.6893E+14 ± 10.77%	5.9783E+17 ± 1.10%	5.9962E+17 ± 1.10%	2.5184E+03

Table D-175. Four-group Neutron Spectrum (m^2s^{-1}) in the Reflector Vessel Side Wall. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2255.40	3.3039E+14	± 4.90%	8.1747E+14	± 3.46%	5.6282E+14	± 4.03%	5.4087E+16	± 1.44%	5.5798E+16	± 1.40%	1.6371E+02
2090.00	3.2769E+14	± 5.17%	7.6977E+14	± 3.45%	5.1712E+14	± 4.09%	7.4328E+16	± 1.25%	7.5943E+16	± 1.22%	2.2682E+02
1940.00	1.7181E+14	± 4.90%	4.0622E+14	± 3.43%	3.3570E+14	± 3.59%	8.8216E+16	± 0.86%	8.9130E+16	± 0.86%	5.1344E+02
1737.00	1.3229E+14	± 5.18%	2.5165E+14	± 3.88%	1.8958E+14	± 4.48%	7.0924E+16	± 0.91%	7.1498E+16	± 0.90%	5.3613E+02
1552.50	1.3768E+14	± 6.38%	2.6220E+14	± 5.32%	1.8675E+14	± 6.13%	1.0805E+17	± 1.13%	1.0864E+17	± 1.12%	7.8478E+02
1345.00	1.4519E+14	± 6.29%	2.6652E+14	± 5.32%	1.9677E+14	± 6.19%	1.8845E+17	± 0.91%	1.8906E+17	± 0.91%	1.2980E+03
1145.00	1.3653E+14	± 6.32%	2.5383E+14	± 5.27%	2.2875E+14	± 5.64%	2.6899E+17	± 0.77%	2.6961E+17	± 0.77%	1.9702E+03
945.00	2.3637E+14	± 5.31%	4.9653E+14	± 4.01%	3.7420E+14	± 4.55%	3.5468E+17	± 0.67%	3.5579E+17	± 0.67%	1.5005E+03
795.00	4.6527E+14	± 4.93%	9.0877E+14	± 3.78%	5.9941E+14	± 4.39%	4.2684E+17	± 0.73%	4.2881E+17	± 0.73%	9.1740E+02
695.00	5.2051E+14	± 4.64%	9.6953E+14	± 3.51%	6.5335E+14	± 4.09%	4.7443E+17	± 0.69%	4.7657E+17	± 0.69%	9.1148E+02
595.00	4.9693E+14	± 4.69%	9.7666E+14	± 3.49%	7.8209E+14	± 4.87%	5.1848E+17	± 0.67%	5.2074E+17	± 0.66%	1.0434E+03
495.00	5.0904E+14	± 4.64%	1.0348E+15	± 3.53%	8.4449E+14	± 7.75%	5.6487E+17	± 0.64%	5.6726E+17	± 0.63%	1.1097E+03
395.00	4.8350E+14	± 4.76%	1.0067E+15	± 3.44%	9.4306E+14	± 8.26%	6.1830E+17	± 0.61%	6.2073E+17	± 0.61%	1.2788E+03
295.00	5.4856E+14	± 4.76%	1.0902E+15	± 3.88%	9.6211E+14	± 5.13%	6.4532E+17	± 0.61%	6.4792E+17	± 0.61%	1.1764E+03
195.00	7.1472E+14	± 4.15%	1.6245E+15	± 5.65%	1.2598E+15	± 3.60%	6.6291E+17	± 0.61%	6.6651E+17	± 0.61%	9.2751E+02
115.00	1.2862E+15	± 4.23%	2.4142E+15	± 5.27%	1.6125E+15	± 3.69%	6.9002E+17	± 0.68%	6.9533E+17	± 0.68%	5.3647E+02
65.00	1.4233E+15	± 4.81%	2.5240E+15	± 3.38%	1.8752E+15	± 6.79%	6.8863E+17	± 0.75%	6.9445E+17	± 0.74%	4.8383E+02
22.50	1.4218E+15	± 4.24%	2.6815E+15	± 3.18%	1.9893E+15	± 6.05%	6.8514E+17	± 0.73%	6.9124E+17	± 0.73%	4.8189E+02
-22.50	1.5475E+15	± 3.94%	2.8245E+15	± 3.12%	1.9774E+15	± 4.70%	7.0162E+17	± 0.74%	7.0797E+17	± 0.73%	4.5338E+02
-65.00	1.4155E+15	± 4.10%	2.8613E+15	± 3.37%	1.8528E+15	± 5.19%	7.1152E+17	± 0.74%	7.1765E+17	± 0.73%	5.0265E+02
-115.00	1.4544E+15	± 3.66%	2.7212E+15	± 3.29%	1.8961E+15	± 5.74%	7.0869E+17	± 0.67%	7.1476E+17	± 0.66%	4.8727E+02
-195.00	1.1372E+15	± 3.33%	2.0923E+15	± 2.69%	1.6037E+15	± 4.27%	6.9362E+17	± 0.59%	6.9845E+17	± 0.59%	6.0996E+02
-295.00	6.5005E+14	± 5.20%	1.4842E+15	± 4.78%	1.2653E+15	± 4.66%	6.8867E+17	± 0.59%	6.9207E+17	± 0.59%	1.0594E+03
-395.00	5.5305E+14	± 4.43%	1.1007E+15	± 3.65%	9.3014E+14	± 4.44%	6.6907E+17	± 0.58%	6.7165E+17	± 0.58%	1.2098E+03
-495.00	5.5903E+14	± 4.90%	1.0634E+15	± 3.49%	8.2590E+14	± 3.90%	6.2796E+17	± 0.60%	6.3041E+17	± 0.60%	1.1233E+03
-595.00	5.7335E+14	± 4.40%	1.0156E+15	± 3.54%	7.3478E+14	± 4.03%	5.9522E+17	± 0.62%	5.9755E+17	± 0.62%	1.0381E+03
-695.00	5.2051E+14	± 4.43%	1.0114E+15	± 3.51%	7.5009E+14	± 4.07%	5.6368E+17	± 0.64%	5.6596E+17	± 0.63%	1.0829E+03
-795.00	5.3856E+14	± 4.63%	1.0227E+15	± 3.62%	7.1330E+14	± 3.99%	5.1969E+17	± 0.66%	5.2196E+17	± 0.66%	9.6496E+02
-945.00	5.3368E+14	± 3.49%	1.0129E+15	± 2.73%	7.3310E+14	± 3.07%	4.4954E+17	± 0.60%	4.5182E+17	± 0.60%	8.4234E+02
-1145.00	4.9960E+14	± 3.59%	9.4912E+14	± 2.76%	6.7700E+14	± 3.14%	3.2708E+17	± 0.70%	3.2920E+17	± 0.69%	6.5467E+02
-1307.50	4.9817E+14	± 4.29%	8.6292E+14	± 3.52%	5.8900E+14	± 4.03%	2.0183E+17	± 0.95%	2.0378E+17	± 0.94%	4.0514E+02
-1446.50	1.6619E+15	± 2.55%	3.9578E+15	± 1.79%	2.8485E+15	± 2.01%	2.2678E+17	± 0.80%	2.3525E+17	± 0.78%	1.3646E+02
-1672.00	1.6307E+15	± 2.29%	3.5969E+15	± 1.63%	2.4524E+15	± 1.85%	2.8598E+17	± 0.65%	2.9366E+17	± 0.63%	1.7538E+02
-1800.00	5.8349E+14	± 3.82%	1.7539E+15	± 2.26%	1.4190E+15	± 2.45%	2.9751E+17	± 0.62%	3.0127E+17	± 0.62%	5.0988E+02
-1950.00	4.2806E+14	± 3.20%	1.0006E+15	± 2.21%	7.7333E+14	± 2.41%	2.5803E+17	± 0.51%	2.6023E+17	± 0.51%	6.0280E+02
-2076.90	4.3013E+14	± 2.81%	9.0303E+14	± 2.05%	6.1950E+14	± 2.38%	1.6731E+17	± 0.58%	1.6926E+17	± 0.58%	3.8897E+02

Table D-176. Four-group Neutron Spectrum (m^2s^{-1}) in the Reflector Vessel Top. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from Centerline	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
253.0	6.1818E+14	± 9.59%	1.8415E+15	± 5.98%	1.1925E+15	± 7.10%	3.1653E+16	± 3.84%	3.5305E+16	± 3.50%	5.1203E+01
476.25	2.8648E+14	± 9.60%	8.4519E+14	± 5.53%	6.8832E+14	± 5.62%	3.9517E+16	± 2.49%	4.1337E+16	± 2.39%	1.3794E+02
723.9	3.0928E+14	± 6.52%	7.4729E+14	± 4.37%	5.9194E+14	± 4.82%	4.2205E+16	± 1.91%	4.3853E+16	± 1.85%	1.3646E+02

Table D-177. Four-group Neutron Spectrum (m^2s^{-1}) in the Reflector Vessel Bottom. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from Centerline	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
253.0	4.0266E+15	± 3.74%	9.8367E+15	± 2.56%	6.3192E+15	± 3.13%	1.8178E+17	± 1.70%	2.0197E+17	± 1.55%	4.5146E+01
476.25	1.7592E+15	± 3.53%	4.3889E+15	± 2.34%	3.2719E+15	± 2.54%	1.7987E+17	± 1.16%	1.8929E+17	± 1.11%	1.0224E+02

Table D-178. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Primary System Heavy Water. Normalized to 330 MWf, with relative errors shown. Cell locations are shown in Figures D-1 and D-2.

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
104	1.3467E+15	± 3.17%	5.6184E+15	± 2.08%	3.8529E+15	± 2.35%	1.9238E+17	± 2.21%	2.0320E+17	± 2.10%	1.4286E+02
105	6.9859E+14	± 5.53%	3.8469E+15	± 2.92%	3.2622E+15	± 3.09%	2.0179E+17	± 2.18%	2.0960E+17	± 2.11%	2.8886E+02
106	6.1679E+14	± 4.01%	2.8918E+15	± 2.33%	2.6774E+15	± 2.27%	2.0634E+17	± 1.81%	2.1253E+17	± 1.76%	3.3454E+02
110	5.8376E+14	± 5.71%	2.2701E+15	± 3.30%	2.2175E+15	± 3.26%	2.0933E+17	± 1.73%	2.1440E+17	± 1.69%	3.5858E+02
125	4.1408E+15	± 2.32%	1.6100E+16	± 1.54%	1.1138E+16	± 2.30%	2.5836E+17	± 2.18%	2.8974E+17	± 1.97%	6.2394E+01
126	2.5353E+15	± 4.39%	1.0825E+16	± 2.20%	9.1753E+15	± 2.45%	2.7789E+17	± 2.20%	3.0042E+17	± 2.04%	1.0961E+02
127	1.8205E+15	± 3.09%	7.8655E+15	± 1.78%	7.2276E+15	± 1.83%	2.8651E+17	± 1.74%	3.0342E+17	± 1.65%	1.5738E+02
132	1.4045E+15	± 4.87%	5.6807E+15	± 2.71%	5.2363E+15	± 2.65%	2.9066E+17	± 1.71%	3.0298E+17	± 1.65%	2.0695E+02
145	1.8847E+16	± 2.36%	7.1742E+16	± 1.50%	6.8987E+16	± 2.10%	1.3911E+18	± 1.01%	1.5507E+18	± 0.93%	7.3811E+01
146	1.3009E+16	± 4.36%	5.5032E+16	± 2.24%	6.5397E+16	± 2.78%	1.6636E+18	± 1.04%	1.7971E+18	± 0.98%	1.2788E+02
147	1.0966E+16	± 3.06%	4.5446E+16	± 1.79%	5.9296E+16	± 1.93%	1.7138E+18	± 0.81%	1.8295E+18	± 0.77%	1.5628E+02
152	9.6219E+15	± 6.72%	3.7249E+16	± 2.85%	5.6044E+16	± 2.90%	1.6490E+18	± 0.82%	1.7519E+18	± 0.80%	1.7138E+02
168	1.0682E+18	± 0.68%	3.6186E+18	± 0.43%	2.6740E+18	± 0.46%	9.3443E+18	± 0.43%	1.6705E+19	± 0.32%	8.7477E+00
169	6.9252E+17	± 1.24%	2.5723E+18	± 0.64%	2.2055E+18	± 0.68%	1.1380E+19	± 0.47%	1.6851E+19	± 0.38%	1.6433E+01
170	1.2056E+18	± 0.54%	3.3206E+18	± 0.37%	2.4344E+18	± 0.41%	1.2382E+19	± 0.34%	1.9343E+19	± 0.27%	1.0270E+01
177	6.6459E+17	± 1.10%	2.2646E+18	± 0.62%	1.9050E+18	± 0.64%	1.3005E+19	± 0.36%	1.7839E+19	± 0.31%	1.9568E+01
214	1.9074E+19	± 0.18%	4.4276E+19	± 0.14%	1.9426E+19	± 0.19%	1.2095E+19	± 0.30%	9.4870E+19	± 0.12%	6.3409E-01
228	2.2406E+19	± 0.16%	3.4553E+19	± 0.14%	1.2334E+19	± 0.22%	6.0558E+18	± 0.31%	7.5349E+19	± 0.11%	2.7027E-01
258	2.3025E+19	± 0.13%	2.7880E+19	± 0.14%	1.0163E+19	± 0.22%	1.4622E+19	± 0.18%	7.5691E+19	± 0.09%	6.3505E-01
303	1.6301E+19	± 0.42%	3.8982E+19	± 0.31%	1.9412E+19	± 0.41%	1.4781E+19	± 0.53%	8.9477E+19	± 0.23%	9.0674E-01
306	1.8402E+19	± 0.36%	3.3373E+19	± 0.30%	1.5193E+19	± 0.42%	1.8387E+19	± 0.39%	8.5356E+19	± 0.20%	9.9918E-01
308	1.5792E+19	± 0.65%	2.7514E+19	± 0.50%	1.3482E+19	± 0.68%	2.6817E+19	± 0.47%	8.3604E+19	± 0.29%	1.6981E+00
403	1.8122E+19	± 0.43%	3.9660E+19	± 0.33%	1.8473E+19	± 0.45%	1.1934E+19	± 0.58%	8.8188E+19	± 0.24%	6.5856E-01
406	1.4088E+19	± 0.37%	3.1877E+19	± 0.28%	1.6248E+19	± 0.37%	2.5598E+19	± 0.35%	8.7811E+19	± 0.19%	1.8170E+00
408	1.0444E+19	± 0.74%	2.5048E+19	± 0.49%	1.4581E+19	± 0.61%	3.3884E+19	± 0.42%	8.3958E+19	± 0.28%	3.2445E+00
528	2.9717E+19	± 0.14%	4.0244E+19	± 0.15%	1.5085E+19	± 0.23%	1.9403E+19	± 0.20%	1.0445E+20	± 0.10%	6.5293E-01
542	1.2006E+19	± 0.42%	3.0012E+19	± 0.30%	1.6691E+19	± 0.38%	3.1456E+19	± 0.33%	9.0164E+19	± 0.20%	2.6200E+00
543	8.2302E+18	± 0.12%	1.8368E+19	± 0.10%	9.5872E+18	± 0.13%	3.2475E+19	± 0.13%	6.8661E+19	± 0.09%	3.9458E+00
558	6.9312E+18	± 0.24%	2.0901E+19	± 0.15%	1.3235E+19	± 0.19%	4.5186E+19	± 0.15%	8.6254E+19	± 0.11%	6.5193E+00
608	1.3056E+18	± 0.64%	4.6865E+18	± 0.39%	3.9192E+18	± 0.41%	2.7715E+19	± 0.30%	3.7626E+19	± 0.26%	2.1227E+01
610	1.0890E+18	± 0.92%	3.8945E+18	± 0.52%	3.3472E+18	± 0.56%	2.8180E+19	± 0.29%	3.6511E+19	± 0.26%	2.5877E+01
611	1.2123E+19	± 0.47%	2.2833E+19	± 0.39%	1.0392E+19	± 0.54%	2.0169E+19	± 0.43%	6.5517E+19	± 0.27%	1.6637E+00
625	7.4946E+17	± 0.91%	2.9471E+18	± 0.50%	2.7834E+18	± 0.50%	3.0021E+19	± 0.24%	3.6501E+19	± 0.22%	4.0056E+01
645	3.2133E+16	± 1.94%	1.1295E+17	± 1.40%	1.3936E+17	± 1.56%	1.0599E+19	± 0.43%	1.0883E+19	± 0.42%	3.2984E+02
650	1.9049E+16	± 1.83%	6.0632E+16	± 1.39%	7.8038E+16	± 1.72%	9.9705E+18	± 0.40%	1.0128E+19	± 0.39%	5.2342E+02
655	1.9434E+16	± 2.73%	6.3061E+16	± 2.01%	9.0468E+16	± 2.21%	1.0928E+19	± 0.37%	1.1101E+19	± 0.37%	5.6230E+02
665	1.3399E+16	± 1.34%	4.3880E+16	± 0.96%	2.9760E+16	± 1.19%	3.3400E+18	± 0.68%	3.4271E+18	± 0.66%	2.4927E+02
670	6.9384E+15	± 1.57%	2.4081E+16	± 1.04%	2.1015E+16	± 1.12%	3.5681E+18	± 0.57%	3.6201E+18	± 0.56%	5.1425E+02
675	5.6119E+15	± 2.49%	1.8996E+16	± 1.52%	1.7704E+16	± 1.58%	3.6394E+18	± 0.58%	3.6818E+18	± 0.58%	6.4852E+02
684	9.3777E+15	± 1.51%	3.2486E+16	± 1.07%	2.0648E+16	± 1.25%	9.7937E+17	± 1.05%	1.0419E+18	± 0.99%	1.0444E+02
688	3.5489E+15	± 2.11%	1.6342E+16	± 1.20%	1.4453E+16	± 1.22%	1.0329E+18	± 0.88%	1.0672E+18	± 0.85%	2.9104E+02
692	3.6341E+15	± 3.09%	1.2900E+16	± 1.76%	1.1796E+16	± 1.72%	1.0495E+18	± 0.89%	1.0778E+18	± 0.87%	2.8880E+02

Table D-179. Four-group Neutron Spectrum (m^2s^{-1}) in the Primary System Heavy Water in Central Control Rod 1. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
Center of CCR	1.1654E+18 ±	1.03%	4.4646E+18 ±	0.58%	1.5687E+18 ±	0.88%	5.9074E+17 ±	1.40%	7.7894E+18 ±	0.46%	5.0690E-01
Inside hafnium	2.2359E+18 ±	0.90%	8.0263E+18 ±	0.51%	2.3173E+18 ±	0.79%	6.4256E+17 ±	1.31%	1.3222E+19 ±	0.41%	2.8739E-01
Along hafnium outside	2.4004E+18 ±	0.57%	8.6775E+18 ±	0.33%	3.9735E+18 ±	0.42%	3.0538E+18 ±	0.55%	1.8105E+19 ±	0.26%	1.2722E+00
Below hafnium outside	7.2407E+18 ±	0.25%	1.6148E+19 ±	0.19%	7.4672E+18 ±	0.26%	1.0949E+19 ±	0.28%	4.1805E+19 ±	0.15%	1.5121E+00
Above hafnium outside	5.8458E+15 ±	2.89%	1.3812E+16 ±	2.38%	6.4438E+15 ±	3.30%	1.8807E+17 ±	2.70%	2.1417E+17 ±	2.40%	3.2171E+01
Center of support tube	6.2400E+18 ±	0.46%	1.5979E+19 ±	0.31%	7.7886E+18 ±	0.42%	1.1388E+19 ±	0.39%	4.1396E+19 ±	0.22%	1.8250E+00

Table D-180. Four-group Neutron Spectrum (m^2s^{-1}) in the Primary System Heavy Water in Central Control Rod 2. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
Center of CCR	1.1481E+18 ±	1.04%	4.4323E+18 ±	0.58%	1.5425E+18 ±	0.89%	5.6722E+17 ±	1.43%	7.6902E+18 ±	0.46%	4.9405E-01
Inside hafnium	2.1727E+18 ±	0.90%	7.9374E+18 ±	0.52%	2.3039E+18 ±	0.80%	6.3017E+17 ±	1.37%	1.3044E+19 ±	0.41%	2.9004E-01
Along hafnium outside	2.3796E+18 ±	0.57%	8.5677E+18 ±	0.33%	3.8917E+18 ±	0.43%	2.9714E+18 ±	0.55%	1.7810E+19 ±	0.27%	1.2487E+00
Below hafnium outside	7.2490E+18 ±	0.25%	1.6116E+19 ±	0.19%	7.4468E+18 ±	0.26%	1.1023E+19 ±	0.28%	4.1834E+19 ±	0.15%	1.5206E+00
Above hafnium outside	5.5840E+15 ±	2.98%	1.3780E+16 ±	2.37%	6.5362E+15 ±	3.81%	1.9429E+17 ±	2.66%	2.2019E+17 ±	2.37%	3.4795E+01
Center of support tube	6.1979E+18 ±	0.46%	1.5918E+19 ±	0.31%	7.7733E+18 ±	0.42%	1.1410E+19 ±	0.39%	4.1300E+19 ±	0.22%	1.8410E+00

Table D-181. Four-group Neutron Spectrum (m^2s^{-1}) in the Primary System Heavy Water in Central Control Rod 3. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
Center of CCR	1.2087E+18 ±	1.03%	4.5759E+18 ±	0.57%	1.5811E+18 ±	0.87%	5.8968E+17 ±	1.42%	7.9554E+18 ±	0.46%	4.8786E-01
Inside hafnium	2.3223E+18 ±	0.90%	8.1781E+18 ±	0.51%	2.3650E+18 ±	0.79%	6.5174E+17 ±	1.33%	1.3517E+19 ±	0.41%	2.8064E-01
Along hafnium outside	2.5069E+18 ±	0.56%	8.9000E+18 ±	0.33%	4.0118E+18 ±	0.42%	3.0742E+18 ±	0.55%	1.8493E+19 ±	0.26%	1.2263E+00
Below hafnium outside	7.2725E+18 ±	0.25%	1.6166E+19 ±	0.19%	7.4448E+18 ±	0.26%	1.1004E+19 ±	0.28%	4.1888E+19 ±	0.15%	1.5131E+00
Above hafnium outside	5.5552E+15 ±	2.99%	1.3973E+16 ±	2.40%	6.6859E+15 ±	3.31%	1.8715E+17 ±	2.63%	2.1336E+17 ±	2.33%	3.3689E+01
Center of support tube	6.2690E+18 ±	0.46%	1.5957E+19 ±	0.31%	7.7870E+18 ±	0.42%	1.1419E+19 ±	0.39%	4.1432E+19 ±	0.22%	1.8216E+00

Table D-182. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Reflector Heavy Water. Normalized to 330 MWf, with relative errors shown. Cell locations are shown in Figures D-3 through D-10.

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2001	1.0303E+15	± 1.35%	3.1292E+15	± 0.91%	3.0650E+15	± 1.15%	1.6560E+18	± 0.54%	1.6632E+18	± 0.54%	1.6074E+03
2011	9.2681E+14	± 1.75%	2.8864E+15	± 1.32%	2.7659E+15	± 1.50%	1.8578E+18	± 0.65%	1.8644E+18	± 0.64%	2.0045E+03
2021	9.9463E+14	± 2.00%	3.0355E+15	± 1.35%	2.8490E+15	± 1.50%	1.8280E+18	± 0.65%	1.8349E+18	± 0.64%	1.8379E+03
2031	1.1715E+15	± 1.60%	3.4833E+15	± 1.14%	3.3339E+15	± 1.49%	1.6898E+18	± 0.59%	1.6978E+18	± 0.59%	1.4425E+03
2041	1.0054E+15	± 1.81%	2.9763E+15	± 1.20%	2.8614E+15	± 1.44%	1.7755E+18	± 0.65%	1.7824E+18	± 0.65%	1.7659E+03
2051	1.0442E+15	± 1.37%	3.2280E+15	± 0.96%	3.2444E+15	± 1.17%	1.5375E+18	± 0.55%	1.5450E+18	± 0.55%	1.4724E+03
2061	3.7109E+14	± 1.32%	9.4319E+14	± 1.13%	7.4133E+14	± 1.13%	8.8152E+17	± 0.64%	8.8357E+17	± 0.63%	2.3755E+03
2071	3.0319E+14	± 2.04%	7.8429E+14	± 1.68%	6.3747E+14	± 1.70%	9.7250E+17	± 0.81%	9.7422E+17	± 0.81%	3.2075E+03
2081	3.0204E+14	± 2.02%	7.9358E+14	± 1.67%	6.5359E+14	± 1.68%	9.6806E+17	± 0.81%	9.6981E+17	± 0.80%	3.2050E+03
2091	3.8323E+14	± 1.81%	9.7809E+14	± 1.52%	7.7703E+14	± 1.53%	9.7032E+17	± 0.78%	9.7246E+17	± 0.78%	2.5319E+03
2101	3.0120E+14	± 2.04%	8.0361E+14	± 1.67%	6.4724E+14	± 1.66%	9.5418E+17	± 0.82%	9.5593E+17	± 0.82%	3.1679E+03
2111	3.9436E+14	± 1.28%	1.0051E+15	± 1.10%	7.9994E+14	± 1.11%	7.7161E+17	± 0.64%	7.7382E+17	± 0.64%	1.9566E+03
2201	1.1192E+18	± 0.56%	3.3367E+18	± 0.39%	2.5458E+18	± 0.41%	2.0407E+19	± 0.35%	2.7409E+19	± 0.30%	1.8233E+01
2211	1.1464E+18	± 0.54%	3.4007E+18	± 0.38%	2.6116E+18	± 0.40%	2.1766E+19	± 0.34%	2.8925E+19	± 0.29%	1.8986E+01
2221	1.1172E+18	± 0.55%	3.3333E+18	± 0.38%	2.5735E+18	± 0.40%	2.1458E+19	± 0.35%	2.8482E+19	± 0.30%	1.9208E+01
2231	1.0792E+18	± 0.57%	3.2229E+18	± 0.39%	2.4712E+18	± 0.42%	1.8984E+19	± 0.36%	2.5758E+19	± 0.30%	1.7592E+01
2241	1.2568E+19	± 0.60%	2.3177E+19	± 0.50%	1.0077E+19	± 0.71%	2.1844E+19	± 0.60%	6.7666E+19	± 0.35%	1.7380E+00
2242	1.3097E+19	± 0.59%	2.4419E+19	± 0.49%	1.0422E+19	± 0.70%	2.3096E+19	± 0.58%	7.1034E+19	± 0.35%	1.7635E+00
2243	1.2809E+19	± 0.59%	2.4038E+19	± 0.50%	1.0271E+19	± 0.70%	2.3257E+19	± 0.59%	7.0374E+19	± 0.35%	1.8158E+00
2244	1.1618E+19	± 0.62%	2.1718E+19	± 0.52%	9.3557E+18	± 0.73%	1.9647E+19	± 0.62%	6.2339E+19	± 0.36%	1.6911E+00
2245	1.4704E+19	± 0.47%	2.7534E+19	± 0.40%	1.1838E+19	± 0.56%	2.3842E+19	± 0.50%	7.7918E+19	± 0.29%	1.6215E+00
2246	1.5361E+19	± 0.46%	2.8567E+19	± 0.39%	1.2274E+19	± 0.55%	2.5925E+19	± 0.48%	8.2127E+19	± 0.28%	1.6877E+00
2247	1.5111E+19	± 0.46%	2.8313E+19	± 0.39%	1.2095E+19	± 0.56%	2.5499E+19	± 0.49%	8.1017E+19	± 0.29%	1.6875E+00
2248	1.3704E+19	± 0.48%	2.6181E+19	± 0.41%	1.1216E+19	± 0.58%	2.0803E+19	± 0.52%	7.1903E+19	± 0.30%	1.5180E+00
2249	1.6234E+19	± 0.53%	2.9675E+19	± 0.45%	1.2867E+19	± 0.62%	2.5538E+19	± 0.55%	8.4315E+19	± 0.31%	1.5731E+00
2250	1.6652E+19	± 0.52%	3.0620E+19	± 0.44%	1.3290E+19	± 0.62%	2.7119E+19	± 0.53%	8.7680E+19	± 0.31%	1.6286E+00
2251	1.6481E+19	± 0.52%	3.0263E+19	± 0.44%	1.2931E+19	± 0.62%	2.6888E+19	± 0.54%	8.6563E+19	± 0.31%	1.6315E+00
2252	1.4994E+19	± 0.55%	2.8086E+19	± 0.46%	1.2339E+19	± 0.64%	2.1931E+19	± 0.57%	7.7350E+19	± 0.32%	1.4627E+00
2253	6.4217E+18	± 0.82%	1.7069E+19	± 0.59%	9.5492E+18	± 0.75%	3.0839E+19	± 0.58%	6.3879E+19	± 0.40%	4.8023E+00
2254	6.6872E+18	± 0.80%	1.8022E+19	± 0.57%	9.8594E+18	± 0.73%	3.2844E+19	± 0.55%	6.7413E+19	± 0.39%	4.9115E+00
2255	6.4721E+18	± 0.80%	1.7637E+19	± 0.57%	9.7046E+18	± 0.73%	3.3127E+19	± 0.56%	6.6940E+19	± 0.39%	5.1184E+00
2256	5.8653E+18	± 0.87%	1.5866E+19	± 0.61%	8.8003E+18	± 0.79%	2.7747E+19	± 0.60%	5.8278E+19	± 0.40%	4.7307E+00
2257	7.5658E+18	± 0.63%	2.0473E+19	± 0.46%	1.1260E+19	± 0.58%	3.3949E+19	± 0.48%	7.3248E+19	± 0.33%	4.4872E+00
2258	7.7970E+18	± 0.62%	2.0916E+19	± 0.45%	1.1656E+19	± 0.58%	3.6599E+19	± 0.46%	7.6969E+19	± 0.32%	4.6940E+00
2259	7.6632E+18	± 0.61%	2.0824E+19	± 0.45%	1.1554E+19	± 0.57%	3.5954E+19	± 0.47%	7.5995E+19	± 0.32%	4.6917E+00
2260	7.0711E+18	± 0.67%	1.9282E+19	± 0.48%	1.0735E+19	± 0.61%	2.9180E+19	± 0.51%	6.6268E+19	± 0.34%	4.1267E+00
2261	8.1641E+18	± 0.72%	2.1823E+19	± 0.52%	1.1971E+19	± 0.66%	3.5979E+19	± 0.53%	7.7937E+19	± 0.36%	4.4070E+00
2262	8.6188E+18	± 0.71%	2.2975E+19	± 0.51%	1.2542E+19	± 0.65%	3.8644E+19	± 0.51%	8.2780E+19	± 0.35%	4.4836E+00
2263	8.3510E+18	± 0.70%	2.2193E+19	± 0.51%	1.2286E+19	± 0.64%	3.7590E+19	± 0.51%	8.0420E+19	± 0.35%	4.5013E+00
2264	7.7349E+18	± 0.76%	2.0680E+19	± 0.54%	1.1634E+19	± 0.69%	3.0708E+19	± 0.56%	7.0758E+19	± 0.37%	3.9701E+00
2265	3.6565E+18	± 1.06%	1.2342E+19	± 0.67%	8.3966E+18	± 0.78%	3.6385E+19	± 0.55%	6.0780E+19	± 0.42%	9.9508E+00
2266	3.8408E+18	± 1.01%	1.2981E+19	± 0.64%	8.6491E+18	± 0.75%	3.8388E+19	± 0.52%	6.3859E+19	± 0.39%	9.9948E+00
2267	3.7834E+18	± 1.01%	1.2611E+19	± 0.64%	8.5445E+18	± 0.75%	3.8426E+19	± 0.53%	6.3364E+19	± 0.40%	1.0156E+01

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
2268	3.4209E+18	± 1.16%	1.1707E+19	± 0.73%	7.9142E+18	± 0.86%	3.3131E+19	± 0.59%	5.6173E+19	± 0.44%	9.6847E+00
2269	4.3926E+18	± 0.81%	1.4840E+19	± 0.52%	9.9437E+18	± 0.61%	4.0300E+19	± 0.47%	6.9477E+19	± 0.35%	9.1745E+00
2270	4.5109E+18	± 0.78%	1.5095E+19	± 0.50%	1.0236E+19	± 0.58%	4.2569E+19	± 0.44%	7.2411E+19	± 0.34%	9.4370E+00
2271	4.4308E+18	± 0.78%	1.5061E+19	± 0.49%	1.0124E+19	± 0.58%	4.2115E+19	± 0.44%	7.1730E+19	± 0.34%	9.5051E+00
2272	4.0604E+18	± 0.90%	1.3957E+19	± 0.56%	9.4220E+18	± 0.66%	3.4814E+19	± 0.50%	6.2254E+19	± 0.37%	8.5741E+00
2273	4.6986E+18	± 0.93%	1.5860E+19	± 0.59%	1.0403E+19	± 0.70%	4.2570E+19	± 0.50%	7.3532E+19	± 0.37%	9.0603E+00
2274	4.9131E+18	± 0.89%	1.6436E+19	± 0.56%	1.0761E+19	± 0.67%	4.4306E+19	± 0.48%	7.6416E+19	± 0.36%	9.0179E+00
2275	4.8348E+18	± 0.89%	1.6014E+19	± 0.56%	1.0863E+19	± 0.67%	4.3518E+19	± 0.48%	7.5229E+19	± 0.36%	9.0011E+00
2276	4.5311E+18	± 1.02%	1.5001E+19	± 0.64%	1.0127E+19	± 0.76%	3.6268E+19	± 0.54%	6.5927E+19	± 0.39%	8.0043E+00
2277	2.1610E+18	± 1.32%	8.8751E+18	± 0.76%	7.1473E+18	± 0.82%	3.9635E+19	± 0.52%	5.7819E+19	± 0.42%	1.8341E+01
2278	2.2936E+18	± 1.24%	9.2261E+18	± 0.72%	7.3421E+18	± 0.78%	4.2167E+19	± 0.49%	6.1029E+19	± 0.40%	1.8385E+01
2279	2.2248E+18	± 1.27%	8.8324E+18	± 0.73%	7.1689E+18	± 0.79%	4.1903E+19	± 0.50%	6.0129E+19	± 0.41%	1.8834E+01
2280	2.0943E+18	± 1.40%	8.4268E+18	± 0.81%	6.6581E+18	± 0.89%	3.5327E+19	± 0.56%	5.2506E+19	± 0.45%	1.6868E+01
2281	2.6278E+18	± 1.00%	1.0515E+19	± 0.59%	8.3446E+18	± 0.64%	4.3908E+19	± 0.45%	6.5396E+19	± 0.36%	1.6709E+01
2282	2.7513E+18	± 0.94%	1.0810E+19	± 0.56%	8.6069E+18	± 0.61%	4.6312E+19	± 0.42%	6.8480E+19	± 0.34%	1.6833E+01
2283	2.6051E+18	± 0.97%	1.0531E+19	± 0.57%	8.4037E+18	± 0.62%	4.5697E+19	± 0.43%	6.7237E+19	± 0.34%	1.7541E+01
2284	2.0679E+18	± 1.08%	8.2308E+18	± 0.64%	6.5653E+18	± 0.69%	3.1470E+19	± 0.47%	4.8334E+19	± 0.38%	1.5219E+01
2285	2.8230E+18	± 1.16%	1.1327E+19	± 0.67%	8.8683E+18	± 0.74%	4.6475E+19	± 0.48%	6.9494E+19	± 0.38%	1.6463E+01
2286	2.9651E+18	± 1.09%	1.1520E+19	± 0.64%	8.9764E+18	± 0.70%	4.7528E+19	± 0.45%	7.0989E+19	± 0.36%	1.6029E+01
2287	2.8681E+18	± 1.11%	1.1338E+19	± 0.65%	8.9203E+18	± 0.70%	4.6953E+19	± 0.46%	7.0080E+19	± 0.37%	1.6371E+01
2288	2.6805E+18	± 1.24%	1.0497E+19	± 0.72%	8.3585E+18	± 0.79%	3.8765E+19	± 0.51%	6.0301E+19	± 0.40%	1.4462E+01
2289	1.3865E+18	± 1.57%	6.2147E+18	± 0.85%	5.7391E+18	± 0.87%	4.0553E+19	± 0.50%	5.3893E+19	± 0.43%	2.9249E+01
2290	1.3620E+18	± 1.52%	6.3318E+18	± 0.83%	5.9162E+18	± 0.84%	4.3961E+19	± 0.48%	5.7571E+19	± 0.41%	3.2277E+01
2291	1.3604E+18	± 1.54%	6.0580E+18	± 0.85%	5.7687E+18	± 0.85%	4.3434E+19	± 0.49%	5.6621E+19	± 0.42%	3.1927E+01
2292	1.4331E+18	± 1.49%	6.2428E+18	± 0.84%	5.5501E+18	± 0.87%	3.6045E+19	± 0.52%	4.9271E+19	± 0.43%	2.5153E+01
2293	1.5971E+18	± 1.21%	7.3186E+18	± 0.67%	6.6923E+18	± 0.68%	4.4343E+19	± 0.43%	5.9951E+19	± 0.36%	2.7765E+01
2294	1.6708E+18	± 1.16%	7.4617E+18	± 0.65%	6.9432E+18	± 0.66%	4.8310E+19	± 0.41%	6.4385E+19	± 0.35%	2.8914E+01
2295	1.5679E+18	± 1.20%	7.1924E+18	± 0.66%	6.7212E+18	± 0.67%	4.7272E+19	± 0.42%	6.2754E+19	± 0.36%	3.0150E+01
2296	1.6043E+18	± 1.19%	7.0505E+18	± 0.67%	6.4376E+18	± 0.68%	3.8688E+19	± 0.44%	5.3780E+19	± 0.37%	2.4115E+01
2297	1.7342E+18	± 1.40%	7.7549E+18	± 0.77%	7.0880E+18	± 0.78%	4.7252E+19	± 0.46%	6.3829E+19	± 0.39%	2.7247E+01
2298	1.8012E+18	± 1.34%	7.8842E+18	± 0.75%	7.2147E+18	± 0.75%	4.8953E+19	± 0.44%	6.5854E+19	± 0.37%	2.7178E+01
2299	1.7385E+18	± 1.36%	7.6946E+18	± 0.75%	7.1539E+18	± 0.77%	4.8231E+19	± 0.45%	6.4818E+19	± 0.38%	2.7742E+01
2300	1.7065E+18	± 1.38%	7.3698E+18	± 0.78%	6.6981E+18	± 0.80%	3.9802E+19	± 0.48%	5.5576E+19	± 0.40%	2.3324E+01
2301	8.6882E+17	± 1.88%	4.2832E+18	± 0.98%	4.5675E+18	± 0.94%	4.1298E+19	± 0.49%	5.1017E+19	± 0.43%	4.7533E+01
2302	8.3426E+17	± 1.89%	4.2134E+18	± 0.98%	4.5818E+18	± 0.93%	4.4314E+19	± 0.47%	5.3943E+19	± 0.42%	5.3117E+01
2303	8.3867E+17	± 1.90%	4.1175E+18	± 0.98%	4.5541E+18	± 0.93%	4.3762E+19	± 0.48%	5.3273E+19	± 0.43%	5.2181E+01
2304	9.0812E+17	± 1.80%	4.4193E+18	± 0.95%	4.4415E+18	± 0.93%	3.6876E+19	± 0.51%	4.6645E+19	± 0.44%	4.0607E+01
2305	1.0009E+18	± 1.46%	5.0566E+18	± 0.77%	5.2434E+18	± 0.74%	4.4878E+19	± 0.42%	5.6178E+19	± 0.37%	4.4836E+01
2306	1.0135E+18	± 1.43%	4.9750E+18	± 0.76%	5.3758E+18	± 0.72%	4.8176E+19	± 0.41%	5.9540E+19	± 0.36%	4.7533E+01
2307	9.7596E+17	± 1.49%	4.8417E+18	± 0.77%	5.2610E+18	± 0.73%	4.7558E+19	± 0.41%	5.8636E+19	± 0.37%	4.8729E+01
2308	1.0273E+18	± 1.44%	4.9443E+18	± 0.78%	5.0954E+18	± 0.74%	3.9742E+19	± 0.43%	5.0809E+19	± 0.38%	3.8686E+01
2309	1.0529E+18	± 1.69%	5.2161E+18	± 0.88%	5.5207E+18	± 0.85%	4.7091E+19	± 0.45%	5.8880E+19	± 0.40%	4.4725E+01
2310	1.1092E+18	± 1.65%	5.2991E+18	± 0.87%	5.6743E+18	± 0.83%	4.8828E+19	± 0.43%	6.0911E+19	± 0.39%	4.4020E+01
2311	1.0582E+18	± 1.69%	5.1931E+18	± 0.88%	5.5421E+18	± 0.84%	4.7880E+19	± 0.44%	5.9674E+19	± 0.39%	4.5248E+01

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
2312	1.0510E+18	± 1.67%	5.1463E+18	± 0.88%	5.3849E+18	± 0.85%	4.1269E+19	± 0.47%	5.2851E+19	± 0.41%	3.9265E+01
2321	2.8137E+16	± 0.90%	1.3479E+17	± 0.47%	1.9560E+17	± 0.39%	1.3721E+19	± 0.27%	1.4079E+19	± 0.26%	4.8764E+02
2331	2.6638E+16	± 1.22%	1.2616E+17	± 0.64%	1.8570E+17	± 0.52%	1.5261E+19	± 0.31%	1.5599E+19	± 0.30%	5.7288E+02
2341	2.7189E+16	± 1.20%	1.2866E+17	± 0.64%	1.8904E+17	± 0.52%	1.4301E+19	± 0.30%	1.4646E+19	± 0.30%	5.2598E+02
2351	2.7765E+16	± 0.90%	1.2861E+17	± 0.47%	1.9117E+17	± 0.39%	1.4289E+19	± 0.26%	1.4637E+19	± 0.25%	5.1464E+02
2361	2.9059E+16	± 0.89%	1.3885E+17	± 0.47%	1.9828E+17	± 0.39%	1.2349E+19	± 0.27%	1.2715E+19	± 0.26%	4.2497E+02
2371	1.3541E+15	± 0.87%	3.5173E+15	± 0.75%	2.9514E+15	± 0.88%	2.6870E+18	± 0.42%	2.6949E+18	± 0.42%	1.9844E+03
2381	1.2483E+15	± 0.81%	3.3787E+15	± 0.68%	2.8021E+15	± 0.74%	2.8020E+18	± 0.40%	2.8094E+18	± 0.40%	2.2446E+03
2391	1.2203E+15	± 0.85%	3.2300E+15	± 0.69%	2.6962E+15	± 0.77%	2.7539E+18	± 0.41%	2.7610E+18	± 0.41%	2.2567E+03
2401	1.5165E+15	± 0.81%	3.8796E+15	± 0.71%	3.2096E+15	± 0.90%	2.2648E+18	± 0.42%	2.2734E+18	± 0.42%	1.4935E+03
2501	1.6229E+19	± 0.57%	2.8978E+19	± 0.49%	1.2690E+19	± 0.68%	2.7236E+19	± 0.57%	8.5133E+19	± 0.33%	1.6782E+00
2502	1.6653E+19	± 0.56%	2.9772E+19	± 0.48%	1.3206E+19	± 0.67%	2.7933E+19	± 0.56%	8.7564E+19	± 0.33%	1.6773E+00
2503	1.6326E+19	± 0.57%	2.9305E+19	± 0.48%	1.2904E+19	± 0.68%	2.7747E+19	± 0.56%	8.6282E+19	± 0.33%	1.6995E+00
2504	1.5194E+19	± 0.59%	2.7768E+19	± 0.50%	1.2381E+19	± 0.69%	2.3655E+19	± 0.59%	7.8999E+19	± 0.34%	1.5569E+00
2505	1.2406E+19	± 0.58%	2.4955E+19	± 0.47%	1.2792E+19	± 0.61%	3.2657E+19	± 0.48%	8.2809E+19	± 0.31%	2.6325E+00
2506	1.2641E+19	± 0.57%	2.5147E+19	± 0.46%	1.2908E+19	± 0.60%	3.2535E+19	± 0.48%	8.3232E+19	± 0.31%	2.5737E+00
2507	1.2496E+19	± 0.57%	2.5100E+19	± 0.47%	1.2964E+19	± 0.60%	3.2783E+19	± 0.48%	8.3342E+19	± 0.31%	2.6236E+00
2508	1.1855E+19	± 0.59%	2.3889E+19	± 0.48%	1.2480E+19	± 0.61%	2.9392E+19	± 0.49%	7.7616E+19	± 0.32%	2.4792E+00
2509	5.5782E+18	± 0.86%	1.8304E+19	± 0.53%	1.3213E+19	± 0.60%	4.6168E+19	± 0.44%	8.3263E+19	± 0.34%	8.2765E+00
2510	5.6455E+18	± 0.86%	1.8548E+19	± 0.53%	1.3233E+19	± 0.60%	4.4939E+19	± 0.45%	8.2366E+19	± 0.33%	7.9601E+00
2511	5.5855E+18	± 0.86%	1.8526E+19	± 0.53%	1.3247E+19	± 0.60%	4.4902E+19	± 0.45%	8.2261E+19	± 0.34%	8.0391E+00
2512	5.3442E+18	± 0.88%	1.7704E+19	± 0.54%	1.2786E+19	± 0.61%	4.3581E+19	± 0.45%	7.9416E+19	± 0.34%	8.1548E+00
2513	4.1631E+18	± 1.09%	1.6608E+19	± 0.62%	1.3030E+19	± 0.68%	5.3057E+19	± 0.46%	8.6857E+19	± 0.36%	1.2744E+01
2514	4.3406E+18	± 1.09%	1.6529E+19	± 0.62%	1.3189E+19	± 0.68%	5.2367E+19	± 0.46%	8.6426E+19	± 0.36%	1.2064E+01
2515	4.2522E+18	± 1.09%	1.6402E+19	± 0.63%	1.2945E+19	± 0.68%	5.1901E+19	± 0.46%	8.5500E+19	± 0.36%	1.2206E+01
2516	4.1572E+18	± 1.10%	1.6291E+19	± 0.63%	1.2821E+19	± 0.68%	5.1863E+19	± 0.47%	8.5132E+19	± 0.37%	1.2475E+01
2517	4.4932E+18	± 0.97%	1.6918E+19	± 0.57%	1.3092E+19	± 0.63%	5.5309E+19	± 0.43%	8.9813E+19	± 0.34%	1.2310E+01
2518	4.4547E+18	± 0.97%	1.6979E+19	± 0.57%	1.3089E+19	± 0.62%	5.4923E+19	± 0.43%	8.9446E+19	± 0.34%	1.2329E+01
2519	4.4460E+18	± 0.96%	1.6746E+19	± 0.57%	1.2981E+19	± 0.63%	5.4265E+19	± 0.43%	8.8438E+19	± 0.34%	1.2206E+01
2520	4.4717E+18	± 0.96%	1.6629E+19	± 0.57%	1.2838E+19	± 0.63%	5.4912E+19	± 0.43%	8.8850E+19	± 0.34%	1.2280E+01
2521	4.6824E+18	± 0.80%	1.7348E+19	± 0.49%	1.2661E+19	± 0.55%	5.4952E+19	± 0.39%	8.9644E+19	± 0.31%	1.1736E+01
2522	4.6134E+18	± 0.80%	1.7145E+19	± 0.49%	1.2578E+19	± 0.55%	5.4181E+19	± 0.39%	8.8517E+19	± 0.31%	1.1744E+01
2523	4.5869E+18	± 0.81%	1.7083E+19	± 0.49%	1.2543E+19	± 0.55%	5.4462E+19	± 0.39%	8.8674E+19	± 0.31%	1.1873E+01
2524	4.6200E+18	± 0.81%	1.7138E+19	± 0.49%	1.2532E+19	± 0.55%	5.4719E+19	± 0.39%	8.9010E+19	± 0.31%	1.1844E+01
2525	4.4787E+18	± 0.97%	1.5953E+19	± 0.59%	1.1452E+19	± 0.67%	5.0751E+19	± 0.45%	8.2635E+19	± 0.36%	1.1332E+01
2526	4.3866E+18	± 0.98%	1.5956E+19	± 0.59%	1.1349E+19	± 0.67%	5.1013E+19	± 0.45%	8.2705E+19	± 0.36%	1.1629E+01
2527	4.3016E+18	± 0.99%	1.5826E+19	± 0.59%	1.1315E+19	± 0.67%	5.1195E+19	± 0.45%	8.2636E+19	± 0.36%	1.1901E+01
2528	4.3217E+18	± 0.99%	1.5913E+19	± 0.59%	1.1316E+19	± 0.68%	5.0924E+19	± 0.45%	8.2475E+19	± 0.36%	1.1783E+01
2529	8.0703E+18	± 0.79%	2.0923E+19	± 0.56%	1.1841E+19	± 0.72%	3.7555E+19	± 0.55%	7.8388E+19	± 0.38%	4.6534E+00
2530	8.4057E+18	± 0.78%	2.1828E+19	± 0.56%	1.2263E+19	± 0.71%	3.8927E+19	± 0.53%	8.1424E+19	± 0.37%	4.6311E+00
2531	8.0488E+18	± 0.78%	2.1421E+19	± 0.55%	1.2051E+19	± 0.71%	3.8358E+19	± 0.53%	7.9879E+19	± 0.37%	4.7657E+00
2532	7.5580E+18	± 0.83%	2.0163E+19	± 0.59%	1.1370E+19	± 0.75%	3.2254E+19	± 0.58%	7.1346E+19	± 0.39%	4.2676E+00
2533	6.2979E+18	± 0.79%	1.7938E+19	± 0.55%	1.1558E+19	± 0.66%	4.2915E+19	± 0.48%	7.8709E+19	± 0.35%	6.8142E+00
2534	6.4554E+18	± 0.78%	1.8189E+19	± 0.54%	1.1674E+19	± 0.65%	4.1884E+19	± 0.47%	7.8203E+19	± 0.35%	6.4882E+00

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
2535	6.2731E+18	± 0.78%	1.7940E+19	± 0.54%	1.1504E+19	± 0.64%	4.1969E+19	± 0.47%	7.7685E+19	± 0.35%	6.6903E+00
2536	6.0979E+18	± 0.83%	1.7443E+19	± 0.56%	1.1179E+19	± 0.68%	3.8071E+19	± 0.49%	7.2791E+19	± 0.36%	6.2433E+00
2537	3.2841E+18	± 1.09%	1.2890E+19	± 0.63%	1.0930E+19	± 0.66%	5.2008E+19	± 0.45%	7.9112E+19	± 0.35%	1.5836E+01
2538	3.3853E+18	± 1.10%	1.3170E+19	± 0.63%	1.1216E+19	± 0.67%	5.0695E+19	± 0.44%	7.8466E+19	± 0.35%	1.4975E+01
2539	3.3530E+18	± 1.09%	1.3124E+19	± 0.63%	1.0926E+19	± 0.66%	5.0111E+19	± 0.45%	7.7514E+19	± 0.35%	1.4945E+01
2540	3.1741E+18	± 1.12%	1.2654E+19	± 0.64%	1.0710E+19	± 0.68%	4.9187E+19	± 0.45%	7.5725E+19	± 0.36%	1.5496E+01
2541	2.4807E+18	± 1.42%	1.1213E+19	± 0.76%	1.0451E+19	± 0.76%	5.8013E+19	± 0.46%	8.2158E+19	± 0.38%	2.3386E+01
2542	2.5342E+18	± 1.41%	1.1462E+19	± 0.75%	1.0812E+19	± 0.76%	5.6974E+19	± 0.46%	8.1783E+19	± 0.38%	2.2482E+01
2543	2.4805E+18	± 1.41%	1.1177E+19	± 0.76%	1.0477E+19	± 0.76%	5.6144E+19	± 0.46%	8.0279E+19	± 0.38%	2.2634E+01
2544	2.4227E+18	± 1.43%	1.0963E+19	± 0.76%	1.0333E+19	± 0.77%	5.6611E+19	± 0.47%	8.0330E+19	± 0.38%	2.3367E+01
2545	2.4948E+18	± 1.28%	1.1306E+19	± 0.69%	1.0306E+19	± 0.70%	6.0113E+19	± 0.43%	8.4220E+19	± 0.36%	2.4095E+01
2546	2.4396E+18	± 1.27%	1.1177E+19	± 0.69%	1.0449E+19	± 0.70%	5.9224E+19	± 0.43%	8.3289E+19	± 0.36%	2.4276E+01
2547	2.4617E+18	± 1.28%	1.1085E+19	± 0.70%	1.0325E+19	± 0.71%	5.8905E+19	± 0.43%	8.2776E+19	± 0.36%	2.3928E+01
2548	2.4583E+18	± 1.27%	1.0972E+19	± 0.70%	1.0288E+19	± 0.71%	5.9453E+19	± 0.44%	8.3171E+19	± 0.36%	2.4185E+01
2549	2.5681E+18	± 1.04%	1.1357E+19	± 0.59%	1.0099E+19	± 0.61%	5.9665E+19	± 0.39%	8.3689E+19	± 0.34%	2.3233E+01
2550	2.5541E+18	± 1.05%	1.1230E+19	± 0.59%	1.0021E+19	± 0.61%	5.9077E+19	± 0.39%	8.2882E+19	± 0.33%	2.3130E+01
2551	2.5171E+18	± 1.05%	1.1206E+19	± 0.59%	1.0021E+19	± 0.60%	5.9404E+19	± 0.39%	8.3148E+19	± 0.33%	2.3600E+01
2552	2.5150E+18	± 1.06%	1.1091E+19	± 0.59%	1.0014E+19	± 0.61%	5.9689E+19	± 0.39%	8.3309E+19	± 0.34%	2.3733E+01
2553	2.4011E+18	± 1.29%	1.0284E+19	± 0.72%	9.0687E+18	± 0.76%	5.5436E+19	± 0.45%	7.7190E+19	± 0.38%	2.3088E+01
2554	2.3504E+18	± 1.31%	1.0224E+19	± 0.73%	8.9510E+18	± 0.76%	5.5593E+19	± 0.45%	7.7118E+19	± 0.38%	2.3653E+01
2555	2.3417E+18	± 1.31%	1.0264E+19	± 0.72%	8.9213E+18	± 0.76%	5.6061E+19	± 0.45%	7.7588E+19	± 0.38%	2.3941E+01
2556	2.3877E+18	± 1.30%	1.0388E+19	± 0.72%	9.1376E+18	± 0.76%	5.6066E+19	± 0.45%	7.7980E+19	± 0.38%	2.3481E+01
2557	4.7273E+18	± 1.02%	1.5270E+19	± 0.65%	1.0345E+19	± 0.76%	4.4061E+19	± 0.52%	7.4403E+19	± 0.39%	9.3206E+00
2558	4.7521E+18	± 1.00%	1.5473E+19	± 0.63%	1.0621E+19	± 0.74%	4.4346E+19	± 0.50%	7.5192E+19	± 0.37%	9.3319E+00
2559	4.5616E+18	± 0.99%	1.5333E+19	± 0.62%	1.0529E+19	± 0.73%	4.3769E+19	± 0.50%	7.4193E+19	± 0.38%	9.5952E+00
2560	4.3609E+18	± 1.13%	1.4710E+19	± 0.71%	1.0106E+19	± 0.83%	3.8309E+19	± 0.56%	6.7486E+19	± 0.42%	8.7845E+00
2561	3.7174E+18	± 1.01%	1.2763E+19	± 0.63%	9.8725E+18	± 0.70%	4.8020E+19	± 0.47%	7.4373E+19	± 0.37%	1.2918E+01
2562	3.6820E+18	± 0.98%	1.3036E+19	± 0.61%	9.9992E+18	± 0.68%	4.6168E+19	± 0.45%	7.2885E+19	± 0.35%	1.2539E+01
2563	3.5803E+18	± 0.98%	1.2856E+19	± 0.60%	9.7356E+18	± 0.67%	4.5836E+19	± 0.45%	7.2008E+19	± 0.35%	1.2802E+01
2564	3.5270E+18	± 1.11%	1.2589E+19	± 0.68%	9.5194E+18	± 0.75%	4.3343E+19	± 0.49%	6.8978E+19	± 0.38%	1.2289E+01
2565	2.0377E+18	± 1.32%	9.1872E+18	± 0.72%	8.9381E+18	± 0.71%	5.4034E+19	± 0.43%	7.4197E+19	± 0.36%	2.6517E+01
2566	2.1406E+18	± 1.30%	9.3965E+18	± 0.72%	9.0519E+18	± 0.71%	5.2181E+19	± 0.43%	7.2770E+19	± 0.36%	2.4376E+01
2567	2.1069E+18	± 1.29%	9.3102E+18	± 0.71%	8.8154E+18	± 0.70%	5.1863E+19	± 0.43%	7.2096E+19	± 0.36%	2.4616E+01
2568	1.9820E+18	± 1.36%	9.0185E+18	± 0.74%	8.7125E+18	± 0.74%	5.1340E+19	± 0.44%	7.1053E+19	± 0.37%	2.5903E+01
2569	1.5986E+18	± 1.68%	7.8141E+18	± 0.86%	8.3874E+18	± 0.82%	5.9336E+19	± 0.45%	7.7136E+19	± 0.39%	3.7118E+01
2570	1.5814E+18	± 1.70%	7.9528E+18	± 0.86%	8.4963E+18	± 0.81%	5.7811E+19	± 0.45%	7.5841E+19	± 0.39%	3.6557E+01
2571	1.6116E+18	± 1.68%	7.7779E+18	± 0.86%	8.4616E+18	± 0.82%	5.7292E+19	± 0.45%	7.5143E+19	± 0.39%	3.5549E+01
2572	1.5476E+18	± 1.73%	7.6241E+18	± 0.87%	8.3785E+18	± 0.82%	5.7961E+19	± 0.46%	7.5511E+19	± 0.39%	3.7451E+01
2573	1.5424E+18	± 1.53%	7.6357E+18	± 0.80%	8.1777E+18	± 0.77%	6.1319E+19	± 0.42%	7.8675E+19	± 0.37%	3.9755E+01
2574	1.4945E+18	± 1.57%	7.6487E+18	± 0.79%	8.1660E+18	± 0.76%	6.0712E+19	± 0.42%	7.8021E+19	± 0.37%	4.0625E+01
2575	1.5359E+18	± 1.55%	7.5188E+18	± 0.80%	8.1502E+18	± 0.76%	6.0323E+19	± 0.42%	7.7528E+19	± 0.37%	3.9274E+01
2576	1.5499E+18	± 1.54%	7.4883E+18	± 0.80%	8.1524E+18	± 0.77%	6.0802E+19	± 0.43%	7.7993E+19	± 0.37%	3.9230E+01
2577	1.5594E+18	± 1.28%	7.7034E+18	± 0.68%	7.9175E+18	± 0.66%	6.1032E+19	± 0.38%	7.8212E+19	± 0.34%	3.9139E+01
2578	1.5655E+18	± 1.29%	7.5296E+18	± 0.69%	7.8596E+18	± 0.66%	6.0637E+19	± 0.39%	7.7592E+19	± 0.34%	3.8734E+01

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
2579	1.5226E+18	± 1.29%	7.6244E+18	± 0.69%	7.8359E+18	± 0.66%	6.0948E+19	± 0.39%	7.7930E+19	± 0.34%	4.0029E+01
2580	1.5312E+18	± 1.28%	7.4855E+18	± 0.69%	7.8563E+18	± 0.65%	6.1099E+19	± 0.39%	7.7972E+19	± 0.34%	3.9903E+01
2581	1.4361E+18	± 1.60%	6.9357E+18	± 0.85%	7.0758E+18	± 0.82%	5.7130E+19	± 0.44%	7.2578E+19	± 0.39%	3.9782E+01
2582	1.4099E+18	± 1.62%	6.9408E+18	± 0.85%	6.9865E+18	± 0.82%	5.7213E+19	± 0.44%	7.2550E+19	± 0.39%	4.0579E+01
2583	1.4203E+18	± 1.62%	6.9363E+18	± 0.85%	7.1031E+18	± 0.82%	5.7286E+19	± 0.44%	7.2745E+19	± 0.39%	4.0333E+01
2584	1.4046E+18	± 1.61%	6.9811E+18	± 0.84%	7.1049E+18	± 0.82%	5.7541E+19	± 0.44%	7.3032E+19	± 0.39%	4.0966E+01
2585	2.7353E+18	± 1.26%	1.0624E+19	± 0.74%	8.5772E+18	± 0.81%	4.6865E+19	± 0.49%	6.8802E+19	± 0.40%	1.7133E+01
2586	2.7871E+18	± 1.21%	1.0873E+19	± 0.71%	8.8845E+18	± 0.78%	4.7088E+19	± 0.47%	6.9633E+19	± 0.38%	1.6895E+01
2587	2.6716E+18	± 1.24%	1.0630E+19	± 0.72%	8.7446E+18	± 0.78%	4.6201E+19	± 0.48%	6.8247E+19	± 0.39%	1.7294E+01
2588	2.5996E+18	± 1.36%	1.0326E+19	± 0.80%	8.3117E+18	± 0.86%	4.1024E+19	± 0.53%	6.2262E+19	± 0.43%	1.5781E+01
2589	2.1667E+18	± 1.25%	8.8557E+18	± 0.72%	7.9007E+18	± 0.75%	4.9685E+19	± 0.45%	6.8608E+19	± 0.38%	2.2931E+01
2590	2.2055E+18	± 1.21%	9.0689E+18	± 0.70%	8.0630E+18	± 0.72%	4.7080E+19	± 0.43%	6.6418E+19	± 0.36%	2.1347E+01
2591	2.1718E+18	± 1.22%	8.9253E+18	± 0.70%	7.9681E+18	± 0.72%	4.6864E+19	± 0.43%	6.5930E+19	± 0.36%	2.1578E+01
2592	2.1159E+18	± 1.34%	8.8368E+18	± 0.77%	7.7446E+18	± 0.79%	4.5222E+19	± 0.47%	6.3919E+19	± 0.39%	2.1373E+01
2593	1.3279E+18	± 1.56%	6.4075E+18	± 0.82%	6.9979E+18	± 0.77%	5.4757E+19	± 0.42%	6.9491E+19	± 0.37%	4.1236E+01
2594	1.3938E+18	± 1.50%	6.5341E+18	± 0.80%	7.0552E+18	± 0.76%	5.1257E+19	± 0.42%	6.6240E+19	± 0.36%	3.6775E+01
2595	1.3820E+18	± 1.53%	6.4964E+18	± 0.81%	6.9840E+18	± 0.77%	5.1006E+19	± 0.42%	6.5869E+19	± 0.37%	3.6907E+01
2596	1.3276E+18	± 1.60%	6.3055E+18	± 0.84%	6.8818E+18	± 0.80%	5.1718E+19	± 0.43%	6.6233E+19	± 0.38%	3.8957E+01
2597	1.0239E+18	± 2.01%	5.3661E+18	± 0.99%	6.4230E+18	± 0.90%	5.8557E+19	± 0.44%	7.1370E+19	± 0.40%	5.7189E+01
2598	1.0400E+18	± 2.00%	5.3730E+18	± 0.98%	6.5112E+18	± 0.89%	5.6481E+19	± 0.44%	6.9405E+19	± 0.39%	5.4310E+01
2599	1.0814E+18	± 1.96%	5.3406E+18	± 0.99%	6.5178E+18	± 0.90%	5.6125E+19	± 0.44%	6.9064E+19	± 0.40%	5.1898E+01
2600	9.7816E+17	± 2.03%	5.2561E+18	± 1.00%	6.4346E+18	± 0.91%	5.7628E+19	± 0.45%	7.0297E+19	± 0.40%	5.8915E+01
2601	9.7480E+17	± 1.85%	5.1397E+18	± 0.94%	6.4054E+18	± 0.84%	6.1010E+19	± 0.42%	7.3530E+19	± 0.38%	6.2587E+01
2602	9.5273E+17	± 1.91%	5.1909E+18	± 0.93%	6.2170E+18	± 0.84%	5.9947E+19	± 0.42%	7.2307E+19	± 0.38%	6.2921E+01
2603	9.7532E+17	± 1.87%	5.1130E+18	± 0.94%	6.2250E+18	± 0.85%	5.9624E+19	± 0.42%	7.1937E+19	± 0.38%	6.1133E+01
2604	9.6911E+17	± 1.86%	5.0815E+18	± 0.94%	6.1370E+18	± 0.85%	6.0440E+19	± 0.42%	7.2628E+19	± 0.38%	6.2367E+01
2605	1.0009E+18	± 1.55%	5.1410E+18	± 0.79%	5.9995E+18	± 0.72%	6.0474E+19	± 0.38%	7.2615E+19	± 0.34%	6.0422E+01
2606	9.7085E+17	± 1.57%	5.0895E+18	± 0.80%	6.0056E+18	± 0.73%	6.0416E+19	± 0.38%	7.2483E+19	± 0.35%	6.2231E+01
2607	9.6197E+17	± 1.56%	5.1053E+18	± 0.79%	6.0188E+18	± 0.73%	6.0596E+19	± 0.38%	7.2682E+19	± 0.35%	6.2991E+01
2608	9.7400E+17	± 1.59%	5.0388E+18	± 0.81%	6.0129E+18	± 0.73%	6.0624E+19	± 0.38%	7.2649E+19	± 0.35%	6.2242E+01
2609	9.0390E+17	± 1.97%	4.5805E+18	± 0.99%	5.3887E+18	± 0.91%	5.6836E+19	± 0.44%	6.7709E+19	± 0.40%	6.2879E+01
2610	8.8236E+17	± 1.97%	4.5969E+18	± 0.99%	5.3062E+18	± 0.92%	5.7057E+19	± 0.44%	6.7842E+19	± 0.40%	6.4664E+01
2611	8.8610E+17	± 1.97%	4.6201E+18	± 0.99%	5.3657E+18	± 0.91%	5.7308E+19	± 0.44%	6.8180E+19	± 0.40%	6.4674E+01
2612	9.1198E+17	± 1.97%	4.6024E+18	± 0.99%	5.3626E+18	± 0.91%	5.7383E+19	± 0.44%	6.8260E+19	± 0.40%	6.2921E+01
2613	1.6800E+18	± 1.54%	7.3762E+18	± 0.85%	6.9150E+18	± 0.87%	4.8347E+19	± 0.47%	6.4318E+19	± 0.40%	2.8779E+01
2614	1.7087E+18	± 1.53%	7.4121E+18	± 0.83%	7.0413E+18	± 0.84%	4.7530E+19	± 0.46%	6.3692E+19	± 0.39%	2.7816E+01
2615	1.6159E+18	± 1.54%	7.2413E+18	± 0.83%	6.9597E+18	± 0.84%	4.6549E+19	± 0.46%	6.2365E+19	± 0.40%	2.8807E+01
2616	1.6681E+18	± 1.54%	7.2060E+18	± 0.85%	6.6649E+18	± 0.86%	4.1756E+19	± 0.49%	5.7295E+19	± 0.42%	2.5033E+01
2617	1.3592E+18	± 1.51%	6.0988E+18	± 0.82%	6.2490E+18	± 0.80%	5.0035E+19	± 0.43%	6.3742E+19	± 0.38%	3.6811E+01
2618	1.3748E+18	± 1.48%	6.1622E+18	± 0.80%	6.2088E+18	± 0.79%	4.6219E+19	± 0.42%	5.9964E+19	± 0.36%	3.3619E+01
2619	1.3120E+18	± 1.50%	5.9706E+18	± 0.81%	6.1328E+18	± 0.79%	4.5715E+19	± 0.42%	5.9131E+19	± 0.37%	3.4843E+01
2620	1.3722E+18	± 1.52%	6.1216E+18	± 0.81%	6.0958E+18	± 0.81%	4.4478E+19	± 0.44%	5.8067E+19	± 0.38%	3.2414E+01
2621	8.9324E+17	± 1.87%	4.4843E+18	± 0.95%	5.4843E+18	± 0.86%	5.4132E+19	± 0.42%	6.4994E+19	± 0.38%	6.0602E+01
2622	9.2668E+17	± 1.80%	4.5468E+18	± 0.92%	5.3869E+18	± 0.84%	4.9114E+19	± 0.41%	5.9975E+19	± 0.37%	5.3000E+01

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2623	8.8963E+17	± 1.79%	4.4490E+18	± 0.93%	5.3388E+18	± 0.85%	4.8105E+19	± 0.41%	5.8782E+19	± 0.37%	5.4073E+01
2624	8.8706E+17	± 1.83%	4.4945E+18	± 0.94%	5.2711E+18	± 0.86%	5.0585E+19	± 0.43%	6.1238E+19	± 0.38%	5.7025E+01
2625	6.9290E+17	± 2.35%	3.6863E+18	± 1.16%	4.9014E+18	± 1.01%	5.7486E+19	± 0.44%	6.6767E+19	± 0.41%	8.2965E+01
2626	7.0694E+17	± 2.36%	3.7410E+18	± 1.15%	4.9572E+18	± 0.98%	5.4654E+19	± 0.44%	6.4059E+19	± 0.40%	7.7310E+01
2627	7.3283E+17	± 2.26%	3.6945E+18	± 1.15%	4.9067E+18	± 0.98%	5.3725E+19	± 0.44%	6.3059E+19	± 0.40%	7.3312E+01
2628	6.4884E+17	± 2.43%	3.6135E+18	± 1.16%	4.9145E+18	± 0.99%	5.5797E+19	± 0.45%	6.4973E+19	± 0.41%	8.5994E+01
2629	6.4958E+17	± 2.23%	3.4731E+18	± 1.11%	4.7407E+18	± 0.94%	5.9066E+19	± 0.42%	6.7929E+19	± 0.39%	9.0929E+01
2630	6.2248E+17	± 2.24%	3.4488E+18	± 1.09%	4.6747E+18	± 0.94%	5.8125E+19	± 0.41%	6.6871E+19	± 0.38%	9.3377E+01
2631	6.4835E+17	± 2.22%	3.4543E+18	± 1.10%	4.6516E+18	± 0.93%	5.7741E+19	± 0.42%	6.6496E+19	± 0.39%	8.9058E+01
2632	6.0326E+17	± 2.28%	3.4290E+18	± 1.09%	4.6170E+18	± 0.93%	5.8578E+19	± 0.42%	6.7227E+19	± 0.39%	9.7102E+01
2633	6.2479E+17	± 1.90%	3.3985E+18	± 0.95%	4.4859E+18	± 0.83%	5.8524E+19	± 0.38%	6.7033E+19	± 0.35%	9.3671E+01
2634	6.2015E+17	± 1.90%	3.3541E+18	± 0.94%	4.4919E+18	± 0.81%	5.9142E+19	± 0.38%	6.7608E+19	± 0.35%	9.5367E+01
2635	6.1441E+17	± 1.88%	3.3873E+18	± 0.94%	4.4891E+18	± 0.81%	5.8975E+19	± 0.38%	6.7466E+19	± 0.35%	9.5986E+01
2636	6.1145E+17	± 1.89%	3.2822E+18	± 0.95%	4.4992E+18	± 0.82%	5.8870E+19	± 0.38%	6.7262E+19	± 0.36%	9.6279E+01
2637	5.5520E+17	± 2.38%	3.0300E+18	± 1.18%	3.9862E+18	± 1.02%	5.5269E+19	± 0.44%	6.2841E+19	± 0.41%	9.9548E+01
2638	5.5293E+17	± 2.35%	2.9868E+18	± 1.17%	3.9726E+18	± 1.02%	5.5608E+19	± 0.43%	6.3121E+19	± 0.41%	1.0057E+02
2639	5.5560E+17	± 2.35%	3.0455E+18	± 1.18%	4.0181E+18	± 1.02%	5.6292E+19	± 0.43%	6.3911E+19	± 0.41%	1.0132E+02
2640	5.9206E+17	± 2.28%	3.0065E+18	± 1.17%	4.0058E+18	± 1.02%	5.5858E+19	± 0.44%	6.3463E+19	± 0.41%	9.4346E+01
2641	1.0727E+18	± 1.86%	5.0233E+18	± 0.98%	5.4430E+18	± 0.94%	4.8309E+19	± 0.46%	5.9847E+19	± 0.41%	4.5035E+01
2642	1.0196E+18	± 1.85%	4.9567E+18	± 0.98%	5.3517E+18	± 0.93%	4.6115E+19	± 0.45%	5.7443E+19	± 0.40%	4.5230E+01
2643	9.9931E+17	± 1.89%	4.8563E+18	± 0.98%	5.2449E+18	± 0.94%	4.5425E+19	± 0.46%	5.6526E+19	± 0.40%	4.5457E+01
2644	1.0238E+18	± 1.86%	4.8537E+18	± 0.99%	5.1781E+18	± 0.94%	4.1974E+19	± 0.48%	5.3030E+19	± 0.42%	4.0998E+01
2645	8.5277E+17	± 1.80%	4.1520E+18	± 0.95%	4.8849E+18	± 0.87%	4.9120E+19	± 0.42%	5.9010E+19	± 0.38%	5.7601E+01
2646	8.9058E+17	± 1.80%	4.1674E+18	± 0.95%	4.6719E+18	± 0.88%	4.3291E+19	± 0.41%	5.3021E+19	± 0.37%	4.8610E+01
2647	8.4554E+17	± 1.84%	4.0156E+18	± 0.97%	4.6944E+18	± 0.89%	4.2825E+19	± 0.41%	5.2380E+19	± 0.37%	5.0648E+01
2648	8.4940E+17	± 1.78%	4.1949E+18	± 0.94%	4.6518E+18	± 0.88%	4.4561E+19	± 0.44%	5.4257E+19	± 0.39%	5.2461E+01
2649	5.8824E+17	± 2.21%	3.0763E+18	± 1.10%	4.0755E+18	± 0.94%	5.2081E+19	± 0.42%	5.9821E+19	± 0.39%	8.8537E+01
2650	6.1083E+17	± 2.14%	3.0514E+18	± 1.11%	3.9360E+18	± 0.96%	4.5000E+19	± 0.40%	5.2599E+19	± 0.37%	7.3670E+01
2651	6.0392E+17	± 2.18%	3.0367E+18	± 1.09%	3.8880E+18	± 0.96%	4.3913E+19	± 0.40%	5.1442E+19	± 0.37%	7.2713E+01
2652	5.8531E+17	± 2.17%	3.0546E+18	± 1.08%	4.0386E+18	± 0.94%	4.9072E+19	± 0.43%	5.6751E+19	± 0.39%	8.3841E+01
2653	4.8060E+17	± 2.79%	2.5658E+18	± 1.35%	3.6978E+18	± 1.12%	5.5341E+19	± 0.44%	6.2085E+19	± 0.41%	1.1515E+02
2654	4.5337E+17	± 2.77%	2.5315E+18	± 1.33%	3.6890E+18	± 1.11%	5.0931E+19	± 0.43%	5.7605E+19	± 0.41%	1.1234E+02
2655	5.0073E+17	± 2.68%	2.5661E+18	± 1.33%	3.6626E+18	± 1.11%	5.0369E+19	± 0.43%	5.7099E+19	± 0.41%	1.0059E+02
2656	4.4318E+17	± 2.84%	2.4925E+18	± 1.35%	3.6705E+18	± 1.11%	5.3406E+19	± 0.45%	6.0012E+19	± 0.42%	1.2051E+02
2657	4.0863E+17	± 2.66%	2.3606E+18	± 1.29%	3.5242E+18	± 1.05%	5.6237E+19	± 0.42%	6.2530E+19	± 0.39%	1.3762E+02
2658	4.1314E+17	± 2.63%	2.2945E+18	± 1.28%	3.4836E+18	± 1.05%	5.5134E+19	± 0.41%	6.1325E+19	± 0.39%	1.3345E+02
2659	4.4052E+17	± 2.62%	2.3784E+18	± 1.29%	3.4848E+18	± 1.05%	5.4910E+19	± 0.42%	6.1214E+19	± 0.39%	1.2465E+02
2660	4.0317E+17	± 2.70%	2.2783E+18	± 1.31%	3.4694E+18	± 1.06%	5.5737E+19	± 0.42%	6.1888E+19	± 0.40%	1.3825E+02
2661	4.1526E+17	± 2.25%	2.2404E+18	± 1.12%	3.3211E+18	± 0.91%	5.6568E+19	± 0.38%	6.2544E+19	± 0.36%	1.3622E+02
2662	4.0621E+17	± 2.29%	2.2093E+18	± 1.13%	3.3267E+18	± 0.91%	5.6455E+19	± 0.38%	6.2397E+19	± 0.36%	1.3898E+02
2663	4.0803E+17	± 2.24%	2.2105E+18	± 1.11%	3.2839E+18	± 0.91%	5.6301E+19	± 0.38%	6.2203E+19	± 0.36%	1.3798E+02
2664	3.8592E+17	± 2.32%	2.1742E+18	± 1.12%	3.2498E+18	± 0.92%	5.6287E+19	± 0.39%	6.2097E+19	± 0.37%	1.4585E+02
2665	3.6224E+17	± 2.84%	1.9646E+18	± 1.39%	2.9397E+18	± 1.14%	5.3211E+19	± 0.44%	5.8477E+19	± 0.41%	1.4689E+02
2666	3.5504E+17	± 2.86%	1.9564E+18	± 1.39%	2.9173E+18	± 1.14%	5.3471E+19	± 0.43%	5.8700E+19	± 0.41%	1.5061E+02

Table D-182. (Continued)

Cell Number	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
2667	3.6537E+17	± 2.85%	2.0141E+18	± 1.39%	2.9200E+18	± 1.15%	5.3954E+19	± 0.43%	5.9254E+19	± 0.41%	1.4767E+02
2668	3.8419E+17	± 2.81%	1.9420E+18	± 1.42%	2.9039E+18	± 1.15%	5.3613E+19	± 0.44%	5.8843E+19	± 0.42%	1.3955E+02
2671	7.7204E+16	± 1.09%	3.6396E+17	± 0.58%	5.7498E+17	± 0.45%	2.5925E+19	± 0.24%	2.6941E+19	± 0.24%	3.3580E+02
2681	6.3493E+16	± 1.01%	2.8381E+17	± 0.57%	4.4653E+17	± 0.46%	2.1614E+19	± 0.21%	2.2408E+19	± 0.20%	3.4042E+02
2691	6.4239E+16	± 1.04%	2.9804E+17	± 0.57%	4.7101E+17	± 0.46%	2.2677E+19	± 0.22%	2.3510E+19	± 0.21%	3.5301E+02
2701	7.1922E+16	± 1.11%	3.4575E+17	± 0.58%	5.3888E+17	± 0.46%	2.3848E+19	± 0.25%	2.4805E+19	± 0.25%	3.3158E+02
2711	3.0701E+15	± 1.11%	7.6346E+15	± 0.93%	6.5481E+15	± 1.20%	3.9264E+18	± 0.38%	3.9436E+18	± 0.38%	1.2789E+03
2721	3.4755E+15	± 0.83%	9.0088E+15	± 0.75%	8.1922E+15	± 1.05%	4.0626E+18	± 0.31%	4.0832E+18	± 0.31%	1.1689E+03
2731	3.0813E+15	± 1.03%	7.9587E+15	± 0.95%	7.5680E+15	± 1.24%	4.0396E+18	± 0.35%	4.0582E+18	± 0.35%	1.3110E+03
2741	3.0047E+15	± 1.12%	7.3758E+15	± 0.99%	6.6430E+15	± 1.34%	3.4103E+18	± 0.38%	3.4273E+18	± 0.38%	1.1350E+03
2801	2.5276E+16	± 0.69%	1.0914E+17	± 0.39%	1.3516E+17	± 0.34%	1.1044E+19	± 0.24%	1.1313E+19	± 0.24%	4.3694E+02
2821	2.5907E+16	± 0.69%	1.1132E+17	± 0.39%	1.3721E+17	± 0.34%	1.1090E+19	± 0.24%	1.1365E+19	± 0.24%	4.2808E+02
2841	2.5143E+16	± 0.69%	1.0901E+17	± 0.39%	1.3447E+17	± 0.34%	1.1618E+19	± 0.24%	1.1887E+19	± 0.24%	4.6208E+02
2861	2.4902E+16	± 0.70%	1.0776E+17	± 0.39%	1.3338E+17	± 0.34%	1.1146E+19	± 0.24%	1.1412E+19	± 0.24%	4.4759E+02
2901	1.0897E+15	± 0.34%	2.7955E+15	± 0.27%	2.3098E+15	± 0.31%	2.8353E+18	± 0.18%	2.8415E+18	± 0.18%	2.6018E+03

Table D-183. Four-group Neutron Spectrum in Safety Rods 1-8 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio	
SSR-1 Inside support	6.0696E+15	± 11.56%	2.7720E+16	± 5.78%	3.3380E+16	± 5.22%	7.8082E+17	± 1.37%	8.4799E+17	± 1.31%	1.2864E+02
SSR-1 Inside sheath	6.2085E+15	± 10.08%	2.8743E+16	± 5.52%	3.4667E+16	± 4.96%	1.0137E+18	± 1.05%	1.0833E+18	± 1.01%	1.6327E+02
SSR-2 Inside support	5.7683E+15	± 11.48%	2.5850E+16	± 5.78%	3.3879E+16	± 5.26%	7.9718E+17	± 1.34%	8.6267E+17	± 1.28%	1.3820E+02
SSR-2 Inside sheath	5.4588E+15	± 9.95%	2.6440E+16	± 6.00%	3.5506E+16	± 4.63%	1.0224E+18	± 1.02%	1.0896E+18	± 0.99%	1.8729E+02
SSR-3 Inside support	6.0019E+15	± 9.88%	2.9795E+16	± 5.27%	3.8700E+16	± 4.68%	1.0025E+18	± 1.03%	1.0770E+18	± 1.00%	1.6703E+02
SSR-3 Inside sheath	4.4389E+15	± 11.63%	2.5771E+16	± 5.64%	3.4197E+16	± 5.15%	7.8988E+17	± 1.34%	8.5429E+17	± 1.29%	1.7795E+02
SSR-4 Inside support	4.8850E+15	± 9.29%	2.3606E+16	± 5.09%	3.3213E+16	± 4.74%	1.0061E+18	± 1.02%	1.0678E+18	± 0.99%	2.0596E+02
SSR-4 Inside sheath	5.0500E+15	± 12.04%	2.7243E+16	± 5.70%	3.2758E+16	± 5.12%	7.8154E+17	± 1.36%	8.4659E+17	± 1.30%	1.5476E+02
SSR-5 Inside support	5.9303E+15	± 13.55%	2.7468E+16	± 5.27%	3.3227E+16	± 4.62%	9.9128E+17	± 1.04%	1.0579E+18	± 1.01%	1.6716E+02
SSR-5 Inside sheath	5.2871E+15	± 12.25%	2.7087E+16	± 5.84%	3.1629E+16	± 5.17%	7.6235E+17	± 1.38%	8.2636E+17	± 1.32%	1.4419E+02
SSR-6 Inside support	5.3907E+15	± 12.15%	2.6390E+16	± 5.48%	3.7761E+16	± 4.64%	9.4781E+17	± 1.05%	1.0174E+18	± 1.02%	1.7582E+02
SSR-6 Inside sheath	5.6202E+15	± 14.46%	2.8837E+16	± 5.58%	3.2352E+16	± 5.53%	7.0798E+17	± 1.40%	7.7478E+17	± 1.34%	1.2597E+02
SSR-7 Inside support	5.3940E+15	± 9.34%	2.8626E+16	± 5.03%	3.7802E+16	± 4.88%	9.1350E+17	± 1.06%	9.8532E+17	± 1.03%	1.6935E+02
SSR-7 Inside sheath	5.6603E+15	± 13.36%	2.5236E+16	± 5.60%	3.2337E+16	± 5.29%	7.4181E+17	± 1.38%	8.0505E+17	± 1.32%	1.3105E+02
SSR-8 Inside support	6.1112E+15	± 10.94%	2.6925E+16	± 5.57%	3.5093E+16	± 5.30%	9.6144E+17	± 1.05%	1.0296E+18	± 1.03%	1.5732E+02
SSR-8 Inside sheath	5.3562E+15	± 12.60%	2.8919E+16	± 5.45%	3.6306E+16	± 5.00%	7.9161E+17	± 1.35%	8.6218E+17	± 1.29%	1.4779E+02

Table D-184. Four-group Neutron Spectrum (m^2s^{-1}) in the Beam Tubes Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1		Group 2		Group 3		Group 4		Total	Thermal/Fast Ratio	
	(E+05 - 17.0E+06 eV)		(100.0 - E+05 eV)		(0.625 - 100.0 eV)		(Below 0.625 eV)				
Beam tube HB-1	7.7660E+16	± 3.34%	3.8236E+17	± 1.68%	5.4312E+17	± 1.38%	1.2993E+19	± 0.36%	1.3996E+19	± 0.35%	1.6730E+02
Beam tube HB-2	7.9613E+16	± 3.25%	3.9919E+17	± 1.63%	5.4645E+17	± 1.36%	1.3570E+19	± 0.35%	1.4595E+19	± 0.34%	1.7044E+02
Beam tube HB-3	8.1167E+16	± 3.23%	3.9364E+17	± 1.60%	5.6147E+17	± 1.35%	1.3850E+19	± 0.35%	1.4887E+19	± 0.35%	1.7064E+02
Beam tube HB-6	7.9833E+16	± 3.22%	3.9476E+17	± 1.62%	5.7491E+17	± 1.33%	1.3811E+19	± 0.35%	1.4861E+19	± 0.35%	1.7300E+02
Beam tube HB-7	8.3863E+16	± 3.26%	3.9486E+17	± 1.62%	5.4890E+17	± 1.35%	1.3532E+19	± 0.35%	1.4560E+19	± 0.34%	1.6136E+02
Beam tube HB-8	8.0697E+16	± 3.36%	4.0272E+17	± 1.60%	5.7401E+17	± 1.33%	1.3838E+19	± 0.35%	1.4896E+19	± 0.34%	1.7148E+02
Beam tube HB-9	8.2519E+16	± 3.30%	3.8941E+17	± 1.64%	5.5323E+17	± 1.36%	1.4124E+19	± 0.35%	1.5150E+19	± 0.34%	1.7117E+02
Through tube	3.7912E+15	± 3.41%	1.1568E+16	± 2.53%	1.3172E+16	± 3.05%	6.3174E+18	± 0.30%	6.3460E+18	± 0.30%	1.6663E+03
Large slant beam tube	3.1350E+15	± 5.04%	9.6050E+15	± 2.91%	1.1554E+16	± 3.84%	5.0294E+18	± 0.48%	5.0536E+18	± 0.48%	1.6043E+03

Table D-185. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-1 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio
Between tubes	2.0171E+15 ± 6.37%	6.4203E+15 ± 3.91%	5.0362E+15 ± 4.52%	3.7892E+18 ± 0.82%	3.8027E+18 ± 0.82%	1.8785E+03				
Inside inner tube	1.9704E+15 ± 12.09%	6.3855E+15 ± 7.10%	4.1998E+15 ± 8.55%	2.5965E+18 ± 1.44%	2.6090E+18 ± 1.44%	1.3178E+03				
Outside sample	2.0646E+15 ± 19.80%	7.8925E+15 ± 10.99%	7.8221E+15 ± 14.46%	6.5890E+18 ± 1.51%	6.6067E+18 ± 1.50%	3.1913E+03				
Below inner tube	b	b	b	7.7306E+18 ± 3.15%	7.7398E+18 ± 3.14%					

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-186. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between upper tubes	1.0375E+15 ± 22.08%	4.1613E+15 ± 11.51%	6.4965E+15 ± 12.90%	1.3896E+18 ± 1.67%	1.4013E+18 ± 1.67%	1.3394E+03
Inside upper inner tube	b	3.7287E+15 ± 15.89%	5.2113E+15 ± 20.85%	1.3791E+18 ± 2.16%	1.3894E+18 ± 2.15%	
Between lower tubes	3.3467E+18 ± 1.03%	1.0238E+19 ± 0.63%	6.7269E+18 ± 0.75%	2.9463E+19 ± 0.45%	4.9774E+19 ± 0.35%	8.8033E+00
Inside lower inner tube	2.0964E+17 ± 10.59%	1.1619E+18 ± 4.71%	1.3524E+18 ± 4.26%	1.4527E+19 ± 1.44%	1.7251E+19 ± 1.34%	6.9293E+01
Outside sample	5.1811E+18 ± 1.70%	1.5373E+19 ± 1.03%	9.5471E+18 ± 1.27%	3.4136E+19 ± 0.71%	6.4237E+19 ± 0.53%	6.5886E+00
Below inner tube	2.7672E+18 ± 5.31%	1.0917E+19 ± 2.78%	1.0024E+19 ± 2.98%	5.0110E+19 ± 1.43%	7.3818E+19 ± 1.17%	1.8108E+01

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-187. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between tubes	2.0047E+15 $\pm$ 8.44%	6.2326E+15 $\pm$ 4.37%	4.7770E+15 $\pm$ 4.56%	4.2482E+18 $\pm$ 0.78%	4.2612E+18 $\pm$ 0.78%	2.1191E+03
Inside inner tube	1.9075E+15 $\pm$ 11.46%	5.1920E+15 $\pm$ 7.77%	4.1015E+15 $\pm$ 8.30%	3.0689E+18 $\pm$ 1.35%	3.0801E+18 $\pm$ 1.35%	1.6088E+03
Outside sample	1.6847E+15 $\pm$ 23.33%	9.6473E+15 $\pm$ 20.29%	5.6148E+15 $\pm$ 11.27%	7.1328E+18 $\pm$ 1.41%	7.1498E+18 $\pm$ 1.41%	4.2340E+03
Below inner tube	a	b	b	7.8104E+18 $\pm$ 3.15%	7.8162E+18 $\pm$ 3.15%	

a No particle interactions recorded.

b Poor statistics; value not reported.

Table D-188. Four-group Neutron Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between upper tubes	6.5654E+14 $\pm$ 15.01%	2.0417E+15 $\pm$ 12.14%	1.6193E+15 $\pm$ 10.77%	9.4317E+17 $\pm$ 2.14%	9.4748E+17 $\pm$ 2.13%	1.4366E+03
Inside upper inner tube	7.3892E+14 $\pm$ 22.21%	1.7986E+15 $\pm$ 15.23%	1.3997E+15 $\pm$ 17.35%	9.4493E+17 $\pm$ 2.76%	9.4886E+17 $\pm$ 2.75%	1.2788E+03
Between lower tubes	6.5594E+17 $\pm$ 1.87%	3.1022E+18 $\pm$ 0.93%	3.3942E+18 $\pm$ 0.88%	3.3313E+19 $\pm$ 0.38%	4.0466E+19 $\pm$ 0.34%	5.0787E+01
Inside lower inner tube	4.0866E+17 $\pm$ 5.08%	1.6766E+18 $\pm$ 2.52%	1.8157E+18 $\pm$ 2.44%	1.9509E+19 $\pm$ 0.87%	2.3411E+19 $\pm$ 0.79%	4.7740E+01
Outside sample	1.0765E+18 $\pm$ 3.64%	5.1456E+18 $\pm$ 1.77%	5.3563E+18 $\pm$ 1.68%	4.8326E+19 $\pm$ 0.62%	5.9904E+19 $\pm$ 0.56%	4.4892E+01
Below inner tube	4.7906E+17 $\pm$ 11.46%	2.8888E+18 $\pm$ 5.30%	3.8647E+18 $\pm$ 4.68%	5.4876E+19 $\pm$ 1.33%	6.2109E+19 $\pm$ 1.25%	1.1455E+02

Table D-189. Four-group Neutron Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between upper tubes	1.4367E+17 $\pm$ 8.58%	7.4711E+17 $\pm$ 4.09%	9.9147E+17 $\pm$ 3.70%	3.1016E+19 $\pm$ 0.92%	3.2898E+19 $\pm$ 0.89%	2.1588E+02
Between trans. tubes	2.0572E+18 $\pm$ 1.71%	6.2864E+18 $\pm$ 1.06%	4.4426E+18 $\pm$ 1.21%	2.4268E+19 $\pm$ 0.67%	3.7054E+19 $\pm$ 0.55%	1.1797E+01
Between lower tubes	4.2449E+18 $\pm$ 2.17%	1.2290E+19 $\pm$ 1.34%	7.7926E+18 $\pm$ 1.63%	2.9265E+19 $\pm$ 0.95%	5.3593E+19 $\pm$ 0.71%	6.8942E+00
Outside sample	4.2451E+18 $\pm$ 1.09%	1.3192E+19 $\pm$ 0.68%	8.8986E+18 $\pm$ 0.78%	3.0186E+19 $\pm$ 0.49%	5.6522E+19 $\pm$ 0.38%	7.1109E+00

Table D-190. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
Between upper tubes	1.6421E+16 ±	8.81%	7.6070E+16 ±	4.11%	1.0200E+17 ±	3.85%	3.0880E+18 ±	0.91%	3.2825E+18 ±	0.88%	1.8805E+02
Between trans. tubes	2.0222E+18 ±	1.73%	6.2753E+18 ±	1.05%	4.4004E+18 ±	1.21%	2.4050E+19 ±	0.67%	3.6748E+19 ±	0.55%	1.1893E+01
Between lower tubes	4.2311E+18 ±	2.18%	1.2718E+19 ±	1.31%	7.8617E+18 ±	1.60%	2.9697E+19 ±	0.94%	5.4508E+19 ±	0.71%	7.0187E+00
Outside sample	4.2189E+18 ±	1.09%	1.3130E+19 ±	0.68%	8.8335E+18 ±	0.78%	3.0656E+19 ±	0.49%	5.6839E+19 ±	0.38%	7.2665E+00

Table D-191. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Cold Sources CS-1 and CS-2 Heavy Water between the Cooling Jacket and Outer Thimble. Normalized to 330 MWf, with relative errors shown.

Location	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
CS-1	9.2302E+15	± 3.02%	4.1637E+16	± 1.54%	7.3398E+16	± 1.19%	6.7560E+18	± 0.27%	6.8803E+18	± 0.27%	7.3195E+02
CS-2	8.9514E+15	± 3.08%	4.1390E+16	± 1.52%	7.6166E+16	± 1.17%	6.4728E+18	± 0.27%	6.5994E+18	± 0.27%	7.2311E+02

Table D-192. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Bertical Isotope Production Facility VH-1 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between tubes	1.0308E+15 ± 7.69%	2.6776E+15 ± 5.45%	2.2694E+15 ± 5.98%	1.9704E+18 ± 0.90%	1.9763E+18 ± 0.89%	1.9115E+03
Between IT and holder	1.0105E+15 ± 11.16%	2.3699E+15 ± 6.54%	2.1973E+15 ± 8.12%	1.8804E+18 ± 0.99%	1.8860E+18 ± 0.99%	1.8609E+03
Inside target	2.1591E+15 ± 13.82%	4.4126E+15 ± 9.81%	2.9717E+15 ± 11.76%	2.2330E+18 ± 1.45%	2.2426E+18 ± 1.44%	1.0343E+03
Above target	4.1899E+14 ± 24.09%	1.0948E+15 ± 18.29%	9.9839E+14 ± 18.01%	1.3651E+18 ± 1.94%	1.3676E+18 ± 1.94%	3.2581E+03

Table D-193. Four-group Neutron Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Isotope Production Facility VH-2 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total		Thermal/Fast Ratio
Between tubes	1.1256E+15 ± 7.99%	2.9330E+15 ± 5.01%	2.4593E+15 ± 5.56%	1.9518E+18 ± 0.90%	1.9583E+18 ±	0.89%	1.7340E+03
Between IT and holder	1.0219E+15 ± 10.17%	2.9009E+15 ± 6.01%	2.2866E+15 ± 6.59%	1.8720E+18 ± 0.99%	1.8782E+18 ±	0.99%	1.8320E+03
Inside target	1.5831E+15 ± 14.38%	5.6286E+15 ± 8.77%	3.1998E+15 ± 10.37%	2.1545E+18 ± 1.46%	2.1649E+18 ±	1.45%	1.3609E+03
Above target	3.9127E+14 ± 24.11%	1.2577E+15 ± 15.21%	7.3822E+14 ± 18.54%	1.3685E+18 ± 1.91%	1.3709E+18 ±	1.91%	3.4975E+03

Table D-194. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Isotope Production Facility VH-3 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between tubes	1.0765E+15 $\pm$ 7.76%	3.3008E+15 $\pm$ 6.49%	2.3533E+15 $\pm$ 6.36%	1.6869E+18 $\pm$ 0.96%	1.6936E+18 $\pm$ 0.95%	1.5670E+03
Between IT and holder	9.6272E+14 $\pm$ 9.93%	3.1677E+15 $\pm$ 7.75%	2.4605E+15 $\pm$ 8.67%	1.6176E+18 $\pm$ 1.05%	1.6242E+18 $\pm$ 1.04%	1.6802E+03
Inside target	1.5071E+15 $\pm$ 16.34%	4.5008E+15 $\pm$ 9.51%	4.6057E+15 $\pm$ 20.70%	1.9698E+18 $\pm$ 1.57%	1.9804E+18 $\pm$ 1.56%	1.3070E+03
Above target	3.6863E+14 $\pm$ 26.42%	1.6268E+15 $\pm$ 13.25%	1.0115E+15 $\pm$ 17.26%	1.0852E+18 $\pm$ 2.10%	1.0883E+18 $\pm$ 2.10%	2.9440E+03

Table D-195. Four-group Neutron Spectrum (m^2s^{-1}) in the Vertical Isotope Production Facility VH-4 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Between tubes	1.2076E+15 $\pm$ 7.29%	2.9111E+15 $\pm$ 5.00%	2.3927E+15 $\pm$ 5.40%	1.6405E+18 $\pm$ 1.00%	1.6471E+18 $\pm$ 1.00%	1.3585E+03
Between IT and holder	1.2162E+15 $\pm$ 9.90%	3.3574E+15 $\pm$ 5.91%	2.2243E+15 $\pm$ 6.38%	1.5601E+18 $\pm$ 1.10%	1.5669E+18 $\pm$ 1.10%	1.2828E+03
Inside target	1.8929E+15 $\pm$ 13.01%	5.2360E+15 $\pm$ 9.32%	3.3283E+15 $\pm$ 10.21%	1.8230E+18 $\pm$ 1.64%	1.8335E+18 $\pm$ 1.63%	9.6307E+02
Above target	5.3910E+14 $\pm$ 29.61%	1.7542E+15 $\pm$ 14.05%	1.2539E+15 $\pm$ 17.06%	1.0781E+18 $\pm$ 2.09%	1.0817E+18 $\pm$ 2.09%	1.9999E+03

Table D-196. Four-group Neutron Spectrum (m^2s^{-1}) in the Pneumatic Tubes PT-1 through PT-5 Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)	Group 2 (100.0 - E+05 eV)	Group 3 (0.625 - 100.0 eV)	Group 4 (Below 0.625 eV)	Total	Thermal/Fast Ratio
Inside PT-1	8.4983E+14 $\pm$ 6.21%	2.1536E+15 $\pm$ 4.52%	1.6025E+15 $\pm$ 5.38%	9.3532E+17 $\pm$ 1.20%	9.3992E+17 $\pm$ 1.19%	1.1006E+03
Inside PT-2	1.4165E+14 $\pm$ 21.22%	7.3960E+14 $\pm$ 13.01%	7.3691E+14 $\pm$ 11.76%	6.3710E+17 $\pm$ 2.64%	6.3872E+17 $\pm$ 2.64%	4.4978E+03
Inside PT-3	2.4549E+14 $\pm$ 13.66%	9.5109E+14 $\pm$ 8.83%	7.1264E+14 $\pm$ 9.32%	1.0203E+18 $\pm$ 1.85%	1.0222E+18 $\pm$ 1.85%	4.1562E+03
Inside PT-4	2.3230E+14 $\pm$ 14.78%	8.9473E+14 $\pm$ 8.64%	9.6866E+14 $\pm$ 8.63%	9.1564E+17 $\pm$ 1.87%	9.1774E+17 $\pm$ 1.87%	3.9416E+03
Inside PT-5	1.4359E+14 $\pm$ 20.71%	7.5180E+14 $\pm$ 11.86%	5.2358E+14 $\pm$ 12.74%	5.1852E+17 $\pm$ 2.73%	5.1994E+17 $\pm$ 2.72%	3.6112E+03

Table D-197. Four-group Neutron Spectrum (m^2s^{-1}) in the Hot Source Heavy Water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
Inside outer shell	5.4463E+15 ±	5.66%	1.8374E+16 ±	3.50%	6.7370E+16 ±	2.10%	7.2785E+18 ±	0.46%	7.3697E+18 ±	0.46%	1.3364E+03
Inside thimble end	9.0332E+15 ±	4.59%	2.7927E+16 ±	3.01%	5.9849E+16 ±	2.52%	9.9372E+18 ±	0.46%	1.0034E+19 ±	0.46%	1.1001E+03
Inside thimble	6.0300E+15 ±	4.29%	1.9210E+16 ±	2.65%	4.1974E+16 ±	2.31%	1.2440E+19 ±	0.47%	1.2507E+19 ±	0.46%	2.0630E+03

Table D-198. Four-group Neutron Spectrum (m^2s^{-1}) in the Borated Fuel Endplates. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total		Thermal/Fast Ratio
537.00	1.1582E+19 ±	0.50%	1.4940E+19 ±	0.48%	5.7658E+18 ±	0.69%	4.8883E+18 ±	0.56%	3.7176E+19 ±	0.32%	4.2206E-01
20.00	2.4551E+19 ±	0.34%	3.4110E+19 ±	0.32%	1.3487E+19 ±	0.46%	8.7824E+18 ±	0.41%	8.0931E+19 ±	0.21%	3.5772E-01
-20.00	2.2054E+19 ±	0.43%	3.9814E+19 ±	0.35%	1.6256E+19 ±	0.48%	5.3983E+18 ±	0.57%	8.3523E+19 ±	0.25%	2.4478E-01
-537.00	2.0970E+19 ±	0.45%	2.7155E+19 ±	0.43%	9.7386E+18 ±	0.64%	7.7458E+18 ±	0.51%	6.5610E+19 ±	0.29%	3.6938E-01

Table D-199. Four-group Neutron Spectrum (m^2s^{-1}) in the Stainless Steel (SS-316) Bolts for Core Pressure Boundary Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (E+05 - 17.0E+06 eV)		Group 2 (100.0 - E+05 eV)		Group 3 (0.625 - 100.0 eV)		Group 4 (Below 0.625 eV)		Total	Thermal/Fast Ratio
2281.40	b		1.3206E+15 ±	23.70%	b		3.4801E+16 ±	9.56%	3.7173E+16 ±	9.02%
-1521.50	b		1.5473E+16 ±	14.58%	1.6726E+16 ±	14.61%	2.7194E+18 ±	3.27%	2.7545E+18 ±	3.23%

Appendix E
PHOTON FLUX RESULT TABLES

Table E-1. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Upper Fuel Element for R=175-179 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	3.2047E+17	± 5.97%	6.1302E+18	± 1.50%	1.4989E+19	± 0.94%	5.2421E+19	± 0.50%	2.8797E+17	± 2.24%	7.4149E+19	± 0.44%
470.25	3.6185E+17	± 4.79%	7.3177E+18	± 1.17%	1.7666E+19	± 0.72%	6.1869E+19	± 0.39%	2.9145E+17	± 1.58%	8.7506E+19	± 0.34%
410.75	3.6895E+17	± 3.51%	8.3448E+18	± 1.01%	2.0753E+19	± 0.63%	7.0767E+19	± 0.34%	3.1476E+17	± 1.31%	1.0055E+20	± 0.30%
353.50	4.3918E+17	± 3.72%	9.4821E+18	± 1.06%	2.3197E+19	± 0.65%	7.8606E+19	± 0.35%	3.6885E+17	± 1.42%	1.1209E+20	± 0.30%
303.50	4.6939E+17	± 4.17%	1.0420E+19	± 1.01%	2.5336E+19	± 0.63%	8.5172E+19	± 0.34%	3.8874E+17	± 1.39%	1.2179E+20	± 0.30%
253.50	5.2413E+17	± 3.68%	1.1036E+19	± 1.01%	2.7129E+19	± 0.62%	9.1454E+19	± 0.32%	4.2574E+17	± 1.35%	1.3057E+20	± 0.29%
203.50	5.6207E+17	± 3.66%	1.1807E+19	± 0.99%	2.8830E+19	± 0.59%	9.6748E+19	± 0.32%	4.5657E+17	± 1.29%	1.3840E+20	± 0.28%
146.25	6.1484E+17	± 3.26%	1.2193E+19	± 0.88%	3.0125E+19	± 0.53%	1.0346E+20	± 0.28%	4.8694E+17	± 1.09%	1.4688E+20	± 0.25%
86.75	7.1334E+17	± 3.17%	1.2303E+19	± 0.91%	3.0803E+19	± 0.54%	1.0808E+20	± 0.29%	5.2513E+17	± 1.11%	1.5242E+20	± 0.26%
42.25	6.2619E+17	± 3.50%	1.1249E+19	± 1.11%	2.8746E+19	± 0.66%	1.0726E+20	± 0.34%	6.0931E+17	± 1.40%	1.4849E+20	± 0.30%

Table E-2. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Upper Fuel Element for R=179-184 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	3.2881E+17	± 5.19%	6.4644E+18	± 1.38%	1.5832E+19	± 0.86%	5.2057E+19	± 0.47%	2.1641E+17	± 1.99%	7.4899E+19	± 0.41%
470.25	3.5356E+17	± 4.34%	7.5970E+18	± 1.07%	1.8959E+19	± 0.66%	6.1502E+19	± 0.37%	2.2008E+17	± 1.39%	8.8632E+19	± 0.32%
410.75	3.8967E+17	± 3.51%	8.8257E+18	± 0.94%	2.2237E+19	± 0.58%	7.0170E+19	± 0.32%	2.4148E+17	± 1.15%	1.0186E+20	± 0.28%
353.50	4.5324E+17	± 3.89%	9.9073E+18	± 0.97%	2.5006E+19	± 0.60%	7.7341E+19	± 0.34%	2.6507E+17	± 1.22%	1.1297E+20	± 0.29%
303.50	4.6702E+17	± 3.77%	1.0795E+19	± 0.91%	2.7183E+19	± 0.58%	8.4017E+19	± 0.32%	2.9024E+17	± 1.21%	1.2275E+20	± 0.28%
253.50	5.1373E+17	± 3.76%	1.1531E+19	± 0.92%	2.8862E+19	± 0.56%	8.9913E+19	± 0.31%	3.1794E+17	± 1.26%	1.3114E+20	± 0.27%
203.50	5.6991E+17	± 3.65%	1.2097E+19	± 0.87%	3.0537E+19	± 0.54%	9.4984E+19	± 0.30%	3.3085E+17	± 1.13%	1.3852E+20	± 0.26%
146.25	6.0474E+17	± 2.88%	1.2733E+19	± 0.79%	3.2046E+19	± 0.48%	1.0129E+20	± 0.26%	3.6539E+17	± 0.96%	1.4704E+20	± 0.23%
86.75	6.8713E+17	± 2.90%	1.2928E+19	± 0.83%	3.3122E+19	± 0.51%	1.0509E+20	± 0.28%	3.7737E+17	± 1.02%	1.5221E+20	± 0.24%
42.25	6.5211E+17	± 3.53%	1.1938E+19	± 1.02%	3.0185E+19	± 0.61%	1.0448E+20	± 0.33%	4.3620E+17	± 1.30%	1.4769E+20	± 0.29%

Table E-3. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Upper Fuel Element for R=184-190 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	3.0868E+17	± 4.98%	6.4958E+18	± 1.27%	1.6228E+19	± 0.78%	5.2527E+19	± 0.44%	1.9504E+17	± 1.85%	7.5755E+19	± 0.38%
470.25	3.4648E+17	± 3.83%	7.8431E+18	± 1.00%	1.9733E+19	± 0.60%	6.1655E+19	± 0.34%	1.9644E+17	± 1.29%	8.9775E+19	± 0.30%
410.75	3.7926E+17	± 3.47%	8.9997E+18	± 0.87%	2.3103E+19	± 0.53%	7.0652E+19	± 0.30%	2.2667E+17	± 1.12%	1.0336E+20	± 0.26%
353.50	4.3402E+17	± 3.62%	1.0358E+19	± 0.91%	2.6093E+19	± 0.55%	7.7525E+19	± 0.32%	2.4555E+17	± 1.16%	1.1466E+20	± 0.27%
303.50	4.7423E+17	± 3.68%	1.1202E+19	± 0.87%	2.8335E+19	± 0.54%	8.3933E+19	± 0.30%	2.6934E+17	± 1.12%	1.2421E+20	± 0.26%
253.50	5.1747E+17	± 3.61%	1.1723E+19	± 0.84%	3.0095E+19	± 0.52%	8.9892E+19	± 0.29%	2.8237E+17	± 1.09%	1.3251E+20	± 0.26%
203.50	5.6438E+17	± 3.25%	1.2443E+19	± 0.81%	3.1682E+19	± 0.50%	9.4478E+19	± 0.29%	3.0143E+17	± 1.04%	1.3947E+20	± 0.24%
146.25	5.9573E+17	± 2.75%	1.3167E+19	± 0.75%	3.3327E+19	± 0.45%	1.0026E+20	± 0.25%	3.2543E+17	± 0.92%	1.4767E+20	± 0.22%
86.75	6.6687E+17	± 2.76%	1.3180E+19	± 0.77%	3.3924E+19	± 0.47%	1.0409E+20	± 0.26%	3.3444E+17	± 0.98%	1.5219E+20	± 0.23%
42.25	6.7577E+17	± 3.27%	1.2325E+19	± 0.95%	3.1171E+19	± 0.56%	1.0278E+20	± 0.31%	3.9366E+17	± 1.20%	1.4735E+20	± 0.27%

Table E-4. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Upper Fuel Element for R=190-205 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	2.9481E+17	± 4.05%	6.6941E+18	± 0.99%	1.6990E+19	± 0.61%	5.4066E+19	± 0.36%	1.9297E+17	± 1.17%	7.8238E+19	± 0.31%
470.25	3.2917E+17	± 3.32%	8.2313E+18	± 0.79%	2.1019E+19	± 0.47%	6.4004E+19	± 0.28%	1.9501E+17	± 0.82%	9.3779E+19	± 0.24%
410.75	3.8465E+17	± 3.01%	9.4103E+18	± 0.69%	2.4529E+19	± 0.42%	7.3468E+19	± 0.24%	2.2077E+17	± 0.69%	1.0801E+20	± 0.21%
353.50	4.3339E+17	± 3.17%	1.0830E+19	± 0.71%	2.7751E+19	± 0.42%	8.0729E+19	± 0.26%	2.4285E+17	± 0.73%	1.1999E+20	± 0.22%
303.50	4.6081E+17	± 2.92%	1.1645E+19	± 0.68%	2.9889E+19	± 0.41%	8.7212E+19	± 0.24%	2.6309E+17	± 0.73%	1.2947E+20	± 0.21%
253.50	5.3312E+17	± 2.91%	1.2279E+19	± 0.66%	3.1276E+19	± 0.40%	9.2512E+19	± 0.24%	2.7896E+17	± 0.71%	1.3688E+20	± 0.21%
203.50	5.4902E+17	± 2.84%	1.2927E+19	± 0.65%	3.3119E+19	± 0.39%	9.6514E+19	± 0.23%	2.9034E+17	± 0.67%	1.4340E+20	± 0.20%
146.25	6.0618E+17	± 2.37%	1.3528E+19	± 0.58%	3.4502E+19	± 0.35%	1.0174E+20	± 0.21%	3.0570E+17	± 0.58%	1.5069E+20	± 0.18%
86.75	6.4994E+17	± 2.41%	1.3597E+19	± 0.61%	3.5138E+19	± 0.36%	1.0479E+20	± 0.21%	3.1545E+17	± 0.62%	1.5449E+20	± 0.19%
42.25	6.7069E+17	± 2.66%	1.2597E+19	± 0.73%	3.2121E+19	± 0.44%	1.0343E+20	± 0.25%	3.7597E+17	± 0.79%	1.4919E+20	± 0.22%

Table E-5. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=205-220 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	3.1462E+17	± 3.89%	6.9908E+18	± 0.91%	1.8169E+19	± 0.56%	5.8178E+19	± 0.33%	2.1543E+17	± 1.03%	8.3868E+19	± 0.29%
470.25	3.5755E+17	± 3.33%	8.5541E+18	± 0.73%	2.2628E+19	± 0.44%	6.9866E+19	± 0.26%	2.2964E+17	± 0.73%	1.0164E+20	± 0.23%
410.75	4.0600E+17	± 2.89%	9.9296E+18	± 0.65%	2.5991E+19	± 0.39%	7.9401E+19	± 0.23%	2.6152E+17	± 0.66%	1.1599E+20	± 0.20%
353.50	4.4682E+17	± 2.93%	1.1328E+19	± 0.66%	2.9684E+19	± 0.39%	8.7295E+19	± 0.24%	2.7151E+17	± 0.66%	1.2902E+20	± 0.20%
303.50	5.1093E+17	± 3.00%	1.2194E+19	± 0.64%	3.1580E+19	± 0.38%	9.3605E+19	± 0.23%	2.9336E+17	± 0.65%	1.3818E+20	± 0.20%
253.50	5.3387E+17	± 2.82%	1.2819E+19	± 0.62%	3.3214E+19	± 0.37%	9.8189E+19	± 0.22%	3.0266E+17	± 0.63%	1.4506E+20	± 0.19%
203.50	5.5886E+17	± 2.61%	1.3207E+19	± 0.61%	3.4662E+19	± 0.36%	1.0240E+20	± 0.22%	3.1864E+17	± 0.64%	1.5115E+20	± 0.19%
146.25	6.1803E+17	± 2.27%	1.3929E+19	± 0.55%	3.6413E+19	± 0.33%	1.0674E+20	± 0.19%	3.3022E+17	± 0.54%	1.5803E+20	± 0.17%
86.75	6.7462E+17	± 2.43%	1.3988E+19	± 0.57%	3.7078E+19	± 0.34%	1.1021E+20	± 0.20%	3.4440E+17	± 0.59%	1.6230E+20	± 0.17%
42.25	7.0016E+17	± 2.53%	1.3003E+19	± 0.69%	3.4104E+19	± 0.41%	1.0795E+20	± 0.23%	3.9619E+17	± 0.74%	1.5615E+20	± 0.21%

Table E-6. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=220-226 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
514.75	3.3071E+17	± 4.52%	6.9130E+18	± 1.09%	1.7942E+19	± 0.67%	6.1248E+19	± 0.39%	2.3015E+17	± 1.60%	8.6663E+19	± 0.33%
470.25	3.9964E+17	± 4.34%	8.4930E+18	± 0.88%	2.2407E+19	± 0.52%	7.3758E+19	± 0.30%	2.5125E+17	± 1.28%	1.0531E+20	± 0.26%
410.75	4.2113E+17	± 3.38%	9.7386E+18	± 0.75%	2.5844E+19	± 0.46%	8.3464E+19	± 0.26%	2.7541E+17	± 1.08%	1.1974E+20	± 0.23%
353.50	4.7262E+17	± 3.35%	1.1413E+19	± 0.78%	3.0081E+19	± 0.47%	9.2919E+19	± 0.28%	3.1325E+17	± 1.06%	1.3520E+20	± 0.24%
303.50	5.4236E+17	± 3.69%	1.2219E+19	± 0.75%	3.2079E+19	± 0.45%	9.8935E+19	± 0.26%	3.2952E+17	± 1.00%	1.4411E+20	± 0.23%
253.50	5.6950E+17	± 3.52%	1.2759E+19	± 0.73%	3.3577E+19	± 0.44%	1.0351E+20	± 0.26%	3.4838E+17	± 0.98%	1.5076E+20	± 0.22%
203.50	6.1158E+17	± 3.20%	1.3309E+19	± 0.72%	3.5199E+19	± 0.43%	1.0811E+20	± 0.25%	3.5934E+17	± 0.95%	1.5759E+20	± 0.22%
146.25	6.4974E+17	± 2.69%	1.4136E+19	± 0.65%	3.7011E+19	± 0.39%	1.1227E+20	± 0.22%	3.7265E+17	± 0.79%	1.6444E+20	± 0.19%
86.75	6.7423E+17	± 2.71%	1.4424E+19	± 0.68%	3.7761E+19	± 0.40%	1.1585E+20	± 0.24%	3.8843E+17	± 0.87%	1.6910E+20	± 0.20%
42.25	7.0172E+17	± 3.13%	1.3093E+19	± 0.80%	3.4991E+19	± 0.49%	1.1376E+20	± 0.28%	4.3613E+17	± 1.05%	1.6298E+20	± 0.24%

Table E-7. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=226-231 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
514.75	3.6773E+17	±	4.50%	6.8011E+18	±	1.14%	1.7836E+19	±	0.71%	6.2130E+19	±	0.40%	2.8160E+17	±	1.81%	8.7416E+19	±	0.34%
470.25	3.8267E+17	±	3.78%	8.3308E+18	±	0.89%	2.2043E+19	±	0.54%	7.4435E+19	±	0.31%	3.0203E+17	±	1.34%	1.0549E+20	±	0.27%
410.75	4.5304E+17	±	3.31%	9.6557E+18	±	0.79%	2.5313E+19	±	0.48%	8.4771E+19	±	0.27%	3.2764E+17	±	1.16%	1.2052E+20	±	0.24%
353.50	5.0358E+17	±	3.65%	1.1316E+19	±	0.80%	2.9697E+19	±	0.48%	9.5529E+19	±	0.28%	3.7276E+17	±	1.06%	1.3742E+20	±	0.24%
303.50	5.4457E+17	±	3.35%	1.2102E+19	±	0.78%	3.1986E+19	±	0.47%	1.0172E+20	±	0.27%	3.8948E+17	±	1.01%	1.4674E+20	±	0.23%
253.50	5.4024E+17	±	3.34%	1.2640E+19	±	0.75%	3.3283E+19	±	0.45%	1.0626E+20	±	0.26%	4.0872E+17	±	0.99%	1.5313E+20	±	0.23%
203.50	6.1382E+17	±	2.99%	1.3357E+19	±	0.75%	3.4782E+19	±	0.44%	1.1070E+20	±	0.26%	4.1840E+17	±	1.00%	1.5987E+20	±	0.22%
146.25	6.3953E+17	±	2.53%	1.3870E+19	±	0.65%	3.6776E+19	±	0.39%	1.1544E+20	±	0.23%	4.3341E+17	±	0.82%	1.6716E+20	±	0.20%
86.75	6.8457E+17	±	2.74%	1.4194E+19	±	0.68%	3.7894E+19	±	0.41%	1.1875E+20	±	0.24%	4.4791E+17	±	0.91%	1.7197E+20	±	0.21%
42.25	7.1048E+17	±	3.19%	1.3392E+19	±	0.82%	3.5173E+19	±	0.50%	1.1635E+20	±	0.28%	4.9682E+17	±	1.09%	1.6612E+20	±	0.25%

Table E-8. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Fuel Element for R=231-235 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
514.75	3.6714E+17	±	4.41%	6.4410E+18	±	1.21%	1.6793E+19	±	0.74%	6.0650E+19	±	0.41%	3.6163E+17	±	1.93%	8.4612E+19	±	0.36%
470.25	3.8074E+17	±	3.49%	7.8489E+18	±	0.93%	2.0578E+19	±	0.55%	7.2768E+19	±	0.32%	4.0260E+17	±	1.47%	1.0198E+20	±	0.28%
410.75	4.3931E+17	±	3.19%	9.0380E+18	±	0.79%	2.3459E+19	±	0.48%	8.3976E+19	±	0.28%	4.4120E+17	±	1.23%	1.1735E+20	±	0.24%
353.50	4.9639E+17	±	3.42%	1.0611E+19	±	0.82%	2.8128E+19	±	0.50%	9.4473E+19	±	0.28%	5.0045E+17	±	1.13%	1.3421E+20	±	0.24%
303.50	5.7401E+17	±	3.38%	1.1435E+19	±	0.78%	2.9989E+19	±	0.49%	1.0097E+20	±	0.28%	5.3652E+17	±	1.16%	1.4350E+20	±	0.24%
253.50	5.6837E+17	±	3.25%	1.2064E+19	±	0.78%	3.1209E+19	±	0.47%	1.0607E+20	±	0.26%	5.7220E+17	±	1.17%	1.5048E+20	±	0.23%
203.50	6.2835E+17	±	3.16%	1.2456E+19	±	0.76%	3.2820E+19	±	0.46%	1.1049E+20	±	0.26%	5.7450E+17	±	1.11%	1.5696E+20	±	0.23%
146.25	6.4835E+17	±	2.56%	1.3204E+19	±	0.67%	3.4765E+19	±	0.41%	1.1507E+20	±	0.23%	5.9002E+17	±	0.90%	1.6428E+20	±	0.20%
86.75	6.9670E+17	±	2.60%	1.3491E+19	±	0.71%	3.5656E+19	±	0.42%	1.1843E+20	±	0.25%	6.1260E+17	±	0.98%	1.6889E+20	±	0.21%
42.25	7.1423E+17	±	3.06%	1.2801E+19	±	0.84%	3.3468E+19	±	0.51%	1.1543E+20	±	0.29%	6.7420E+17	±	1.21%	1.6309E+20	±	0.25%

Table E-9. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=102-106 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.4407E+17	± 4.43%	1.0060E+19	± 1.46%	2.5580E+19	± 0.92%	1.1888E+20	± 0.44%	7.2455E+17	± 2.15%	1.5589E+20	± 0.39%
-86.75	7.1112E+17	± 3.92%	1.1632E+19	± 1.18%	2.9818E+19	± 0.72%	1.3065E+20	± 0.36%	7.1646E+17	± 1.81%	1.7353E+20	± 0.32%
-146.25	7.0278E+17	± 3.47%	1.2800E+19	± 1.08%	3.2454E+19	± 0.65%	1.3949E+20	± 0.32%	7.5336E+17	± 1.71%	1.8620E+20	± 0.29%
-203.50	7.2170E+17	± 4.72%	1.4701E+19	± 1.11%	3.7706E+19	± 0.68%	1.4101E+20	± 0.35%	7.1433E+17	± 1.36%	1.9485E+20	± 0.31%
-253.50	6.6886E+17	± 5.07%	1.4726E+19	± 1.10%	3.7925E+19	± 0.66%	1.3987E+20	± 0.34%	7.0667E+17	± 1.41%	1.9390E+20	± 0.31%
-303.50	6.0274E+17	± 4.87%	1.4368E+19	± 1.13%	3.6760E+19	± 0.67%	1.3455E+20	± 0.35%	6.7167E+17	± 1.44%	1.8695E+20	± 0.31%
-353.50	5.7657E+17	± 4.40%	1.3684E+19	± 1.20%	3.5152E+19	± 0.69%	1.2762E+20	± 0.36%	6.3266E+17	± 1.50%	1.7766E+20	± 0.32%
-410.75	6.0109E+17	± 4.56%	1.2771E+19	± 1.09%	3.3491E+19	± 0.65%	1.1707E+20	± 0.34%	5.8382E+17	± 1.35%	1.6452E+20	± 0.30%
-470.25	5.7777E+17	± 4.91%	1.1281E+19	± 1.23%	3.0117E+19	± 0.74%	1.0460E+20	± 0.39%	5.1616E+17	± 1.56%	1.4709E+20	± 0.34%
-514.75	6.1886E+17	± 5.12%	9.7541E+18	± 1.49%	2.5931E+19	± 0.94%	9.1208E+19	± 0.49%	4.9772E+17	± 1.99%	1.2801E+20	± 0.43%

Table E-10. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Lower Fuel Element for R=106-111.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.8434E+17	± 4.72%	1.0637E+19	± 1.33%	2.7142E+19	± 0.84%	1.1738E+20	± 0.40%	5.3461E+17	± 2.16%	1.5638E+20	± 0.36%
-86.75	7.1030E+17	± 4.07%	1.2536E+19	± 1.10%	3.1542E+19	± 0.64%	1.2940E+20	± 0.33%	5.0779E+17	± 1.55%	1.7470E+20	± 0.29%
-146.25	7.2491E+17	± 3.85%	1.3349E+19	± 0.99%	3.4788E+19	± 0.59%	1.3805E+20	± 0.30%	5.2998E+17	± 1.52%	1.8744E+20	± 0.27%
-203.50	6.9870E+17	± 3.99%	1.5591E+19	± 0.98%	3.9789E+19	± 0.59%	1.3665E+20	± 0.32%	5.0863E+17	± 1.24%	1.9323E+20	± 0.28%
-253.50	6.5177E+17	± 4.27%	1.5615E+19	± 1.00%	4.0540E+19	± 0.59%	1.3553E+20	± 0.33%	4.8718E+17	± 1.24%	1.9282E+20	± 0.28%
-303.50	6.4653E+17	± 4.56%	1.5021E+19	± 1.01%	3.9177E+19	± 0.60%	1.3030E+20	± 0.33%	4.6254E+17	± 1.24%	1.8561E+20	± 0.29%
-353.50	6.1612E+17	± 4.39%	1.4328E+19	± 1.03%	3.7264E+19	± 0.61%	1.2343E+20	± 0.34%	4.4289E+17	± 1.25%	1.7608E+20	± 0.29%
-410.75	6.0756E+17	± 4.14%	1.3610E+19	± 0.97%	3.5349E+19	± 0.58%	1.1321E+20	± 0.32%	4.0957E+17	± 1.12%	1.6318E+20	± 0.28%
-470.25	5.3732E+17	± 4.48%	1.1892E+19	± 1.08%	3.1690E+19	± 0.65%	1.0128E+20	± 0.36%	3.5516E+17	± 1.29%	1.4576E+20	± 0.32%
-514.75	6.1166E+17	± 5.34%	1.0378E+19	± 1.35%	2.7472E+19	± 0.83%	8.8681E+19	± 0.45%	3.5577E+17	± 1.69%	1.2750E+20	± 0.39%

Table E-11. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=111.5-118.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.8664E+17	± 4.03%	1.1056E+19	± 1.22%	2.7556E+19	± 0.74%	1.1635E+20	± 0.38%	4.6415E+17	± 1.90%	1.5611E+20	± 0.33%
-86.75	7.1618E+17	± 3.66%	1.2972E+19	± 0.98%	3.3036E+19	± 0.58%	1.2906E+20	± 0.31%	4.3120E+17	± 1.42%	1.7621E+20	± 0.27%
-146.25	7.1462E+17	± 3.39%	1.3795E+19	± 0.88%	3.6186E+19	± 0.53%	1.3754E+20	± 0.28%	4.5303E+17	± 1.31%	1.8869E+20	± 0.25%
-203.50	7.1394E+17	± 3.73%	1.6112E+19	± 0.89%	4.1741E+19	± 0.54%	1.3487E+20	± 0.30%	4.3882E+17	± 1.07%	1.9387E+20	± 0.26%
-253.50	7.0179E+17	± 4.13%	1.6146E+19	± 0.90%	4.2091E+19	± 0.54%	1.3283E+20	± 0.30%	4.2821E+17	± 1.10%	1.9219E+20	± 0.26%
-303.50	6.4696E+17	± 4.05%	1.5716E+19	± 0.93%	4.0645E+19	± 0.54%	1.2815E+20	± 0.31%	4.1280E+17	± 1.18%	1.8556E+20	± 0.27%
-353.50	6.1279E+17	± 4.18%	1.4685E+19	± 0.93%	3.8661E+19	± 0.56%	1.2173E+20	± 0.32%	3.8250E+17	± 1.16%	1.7608E+20	± 0.27%
-410.75	5.7092E+17	± 3.71%	1.3893E+19	± 0.87%	3.6251E+19	± 0.52%	1.1080E+20	± 0.30%	3.4377E+17	± 1.04%	1.6186E+20	± 0.26%
-470.25	5.2706E+17	± 3.99%	1.2225E+19	± 0.98%	3.2438E+19	± 0.58%	9.9290E+19	± 0.34%	3.1387E+17	± 1.19%	1.4479E+20	± 0.29%
-514.75	5.4352E+17	± 4.29%	1.0506E+19	± 1.24%	2.7412E+19	± 0.74%	8.6507E+19	± 0.42%	3.1047E+17	± 1.50%	1.2528E+20	± 0.37%

Table E-12. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=118.5-135 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.6763E+17	± 3.24%	1.1348E+19	± 0.93%	2.8725E+19	± 0.57%	1.1679E+20	± 0.30%	4.4727E+17	± 1.27%	1.5798E+20	± 0.27%
-86.75	7.0024E+17	± 2.78%	1.3274E+19	± 0.75%	3.4745E+19	± 0.45%	1.2931E+20	± 0.25%	4.1478E+17	± 0.83%	1.7844E+20	± 0.22%
-146.25	7.4262E+17	± 2.65%	1.4507E+19	± 0.69%	3.8359E+19	± 0.41%	1.3806E+20	± 0.23%	4.2640E+17	± 0.77%	1.9210E+20	± 0.20%
-203.50	6.9350E+17	± 2.99%	1.6532E+19	± 0.69%	4.3504E+19	± 0.41%	1.3535E+20	± 0.24%	4.1909E+17	± 0.70%	1.9650E+20	± 0.21%
-253.50	6.6376E+17	± 3.11%	1.6601E+19	± 0.69%	4.3298E+19	± 0.41%	1.3351E+20	± 0.25%	3.9973E+17	± 0.76%	1.9448E+20	± 0.21%
-303.50	6.3648E+17	± 3.14%	1.6174E+19	± 0.71%	4.2426E+19	± 0.42%	1.2926E+20	± 0.25%	3.9198E+17	± 0.73%	1.8889E+20	± 0.21%
-353.50	6.1647E+17	± 3.18%	1.5564E+19	± 0.71%	4.0417E+19	± 0.43%	1.2224E+20	± 0.25%	3.6738E+17	± 0.73%	1.7920E+20	± 0.22%
-410.75	6.0244E+17	± 3.19%	1.4445E+19	± 0.69%	3.7708E+19	± 0.40%	1.1067E+20	± 0.24%	3.2701E+17	± 0.68%	1.6375E+20	± 0.21%
-470.25	5.3353E+17	± 3.39%	1.2789E+19	± 0.78%	3.3297E+19	± 0.45%	9.8707E+19	± 0.27%	2.9094E+17	± 0.79%	1.4562E+20	± 0.24%
-514.75	5.3739E+17	± 3.69%	1.0646E+19	± 0.95%	2.7671E+19	± 0.57%	8.5817E+19	± 0.34%	2.9524E+17	± 1.04%	1.2497E+20	± 0.30%

Table E-13. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=135-151.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-42.25	7.0039E+17 $\pm$ 2.97%	1.1560E+19 $\pm$ 0.85%	2.8950E+19 $\pm$ 0.52%	1.1746E+20 $\pm$ 0.28%	4.5387E+17 $\pm$ 1.11%	1.5912E+20 $\pm$ 0.25%
-86.75	7.3553E+17 $\pm$ 2.50%	1.3591E+19 $\pm$ 0.70%	3.5487E+19 $\pm$ 0.42%	1.3146E+20 $\pm$ 0.23%	4.3423E+17 $\pm$ 0.83%	1.8170E+20 $\pm$ 0.21%
-146.25	7.6133E+17 $\pm$ 2.47%	1.4785E+19 $\pm$ 0.63%	3.9240E+19 $\pm$ 0.38%	1.4052E+20 $\pm$ 0.22%	4.5493E+17 $\pm$ 0.73%	1.9376E+20 $\pm$ 0.19%
-203.50	7.2806E+17 $\pm$ 2.70%	1.6937E+19 $\pm$ 0.54%	4.5028E+19 $\pm$ 0.38%	1.4096E+20 $\pm$ 0.22%	4.5021E+17 $\pm$ 0.63%	2.0410E+20 $\pm$ 0.19%
-253.50	6.7834E+17 $\pm$ 2.85%	1.7128E+19 $\pm$ 0.63%	4.5009E+19 $\pm$ 0.38%	1.3818E+20 $\pm$ 0.23%	4.3164E+17 $\pm$ 0.65%	2.0142E+20 $\pm$ 0.19%
-303.50	6.6217E+17 $\pm$ 2.93%	1.6871E+19 $\pm$ 0.65%	4.4063E+19 $\pm$ 0.38%	1.3479E+20 $\pm$ 0.23%	4.2373E+17 $\pm$ 0.66%	1.9681E+20 $\pm$ 0.20%
-353.50	6.3861E+17 $\pm$ 2.92%	1.6022E+19 $\pm$ 0.66%	4.2335E+19 $\pm$ 0.39%	1.2809E+20 $\pm$ 0.23%	3.9940E+17 $\pm$ 0.68%	1.8749E+20 $\pm$ 0.20%
-410.75	6.0249E+17 $\pm$ 2.91%	1.4968E+19 $\pm$ 0.63%	3.9726E+19 $\pm$ 0.37%	1.1609E+20 $\pm$ 0.22%	3.4842E+17 $\pm$ 0.62%	1.7173E+20 $\pm$ 0.20%
-470.25	5.6236E+17 $\pm$ 3.10%	1.3308E+19 $\pm$ 0.70%	3.5360E+19 $\pm$ 0.41%	1.0367E+20 $\pm$ 0.25%	3.1506E+17 $\pm$ 0.72%	1.5322E+20 $\pm$ 0.22%
-514.75	5.5524E+17 $\pm$ 3.38%	1.1062E+19 $\pm$ 0.88%	2.8978E+19 $\pm$ 0.53%	8.8761E+19 $\pm$ 0.32%	3.0621E+17 $\pm$ 0.95%	1.2966E+20 $\pm$ 0.27%

Table E-14. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=151.5-158.5 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-42.25	7.1681E+17 $\pm$ 3.53%	1.1252E+19 $\pm$ 1.01%	2.8242E+19 $\pm$ 0.63%	1.1775E+20 $\pm$ 0.33%	4.9468E+17 $\pm$ 1.75%	1.5846E+20 $\pm$ 0.28%
-86.75	7.5837E+17 $\pm$ 2.68%	1.3286E+19 $\pm$ 0.81%	3.4501E+19 $\pm$ 0.49%	1.3173E+20 $\pm$ 0.27%	4.6102E+17 $\pm$ 1.18%	1.8073E+20 $\pm$ 0.23%
-146.25	7.9973E+17 $\pm$ 2.76%	1.4486E+19 $\pm$ 0.74%	3.8335E+19 $\pm$ 0.44%	1.4069E+20 $\pm$ 0.24%	4.9044E+17 $\pm$ 1.13%	1.9480E+20 $\pm$ 0.21%
-203.50	7.7006E+17 $\pm$ 3.21%	1.6977E+19 $\pm$ 0.75%	4.4643E+19 $\pm$ 0.44%	1.4530E+20 $\pm$ 0.26%	4.8869E+17 $\pm$ 1.02%	2.0818E+20 $\pm$ 0.23%
-253.50	6.9353E+17 $\pm$ 3.14%	1.6677E+19 $\pm$ 0.73%	4.4858E+19 $\pm$ 0.44%	1.4256E+20 $\pm$ 0.26%	4.6903E+17 $\pm$ 1.05%	2.0525E+20 $\pm$ 0.22%
-303.50	6.7981E+17 $\pm$ 3.26%	1.6448E+19 $\pm$ 0.75%	4.3625E+19 $\pm$ 0.45%	1.3930E+20 $\pm$ 0.26%	4.5317E+17 $\pm$ 1.05%	2.0051E+20 $\pm$ 0.23%
-353.50	6.6265E+17 $\pm$ 3.34%	1.5882E+19 $\pm$ 0.77%	4.1947E+19 $\pm$ 0.46%	1.3325E+20 $\pm$ 0.27%	4.4193E+17 $\pm$ 1.09%	1.9218E+20 $\pm$ 0.23%
-410.75	6.3593E+17 $\pm$ 3.23%	1.5162E+19 $\pm$ 0.71%	4.0684E+19 $\pm$ 0.42%	1.2221E+20 $\pm$ 0.25%	3.9600E+17 $\pm$ 0.84%	1.7908E+20 $\pm$ 0.22%
-470.25	5.8889E+17 $\pm$ 3.28%	1.3636E+19 $\pm$ 0.80%	3.6549E+19 $\pm$ 0.47%	1.0940E+20 $\pm$ 0.28%	3.5302E+17 $\pm$ 0.97%	1.6052E+20 $\pm$ 0.24%
-514.75	6.0938E+17 $\pm$ 3.99%	1.1443E+19 $\pm$ 1.01%	3.0221E+19 $\pm$ 0.61%	9.4388E+19 $\pm$ 0.36%	3.4078E+17 $\pm$ 1.34%	1.3700E+20 $\pm$ 0.31%

Table E-15. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=158.5-164 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.9087E+17	± 3.34%	1.0883E+19	± 1.06%	2.7360E+19	± 0.65%	1.1683E+20	± 0.33%	5.8338E+17	± 1.76%	1.5635E+20	± 0.29%
-86.75	7.9745E+17	± 2.77%	1.2857E+19	± 0.84%	3.3391E+19	± 0.51%	1.2994E+20	± 0.27%	5.6154E+17	± 1.45%	1.7754E+20	± 0.24%
-146.25	8.0377E+17	± 2.75%	1.3978E+19	± 0.75%	3.6733E+19	± 0.45%	1.3914E+20	± 0.25%	5.6726E+17	± 1.28%	1.9122E+20	± 0.22%
-203.50	7.7729E+17	± 3.24%	1.6448E+19	± 0.75%	4.3189E+19	± 0.46%	1.4629E+20	± 0.26%	5.7585E+17	± 1.09%	2.0728E+20	± 0.23%
-253.50	7.1728E+17	± 3.27%	1.6403E+19	± 0.77%	4.3596E+19	± 0.46%	1.4342E+20	± 0.26%	5.4887E+17	± 1.13%	2.0468E+20	± 0.23%
-303.50	7.0326E+17	± 3.37%	1.6017E+19	± 0.77%	4.2855E+19	± 0.46%	1.4081E+20	± 0.27%	5.2770E+17	± 1.09%	2.0092E+20	± 0.23%
-353.50	6.7779E+17	± 3.49%	1.5524E+19	± 0.78%	4.1111E+19	± 0.48%	1.3434E+20	± 0.28%	5.1974E+17	± 1.18%	1.9217E+20	± 0.24%
-410.75	6.6077E+17	± 3.14%	1.5151E+19	± 0.73%	4.0872E+19	± 0.43%	1.2558E+20	± 0.26%	4.6216E+17	± 0.88%	1.8273E+20	± 0.22%
-470.25	6.3666E+17	± 3.46%	1.3514E+19	± 0.80%	3.6725E+19	± 0.49%	1.1293E+20	± 0.29%	4.2127E+17	± 1.02%	1.6422E+20	± 0.25%
-514.75	6.3771E+17	± 4.10%	1.1400E+19	± 1.04%	3.0697E+19	± 0.61%	9.7139E+19	± 0.36%	3.9946E+17	± 1.41%	1.4027E+20	± 0.31%

Table E-16. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element for R=164-168 mm. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-42.25	6.8406E+17	± 3.58%	1.0172E+19	± 1.12%	2.5232E+19	± 0.68%	1.1488E+20	± 0.35%	8.5103E+17	± 1.84%	1.5181E+20	± 0.30%
-86.75	7.4996E+17	± 2.70%	1.1774E+19	± 0.85%	3.0604E+19	± 0.52%	1.2614E+20	± 0.28%	7.6767E+17	± 1.55%	1.7004E+20	± 0.25%
-146.25	7.8518E+17	± 2.68%	1.2995E+19	± 0.77%	3.3739E+19	± 0.46%	1.3503E+20	± 0.26%	7.8871E+17	± 1.44%	1.8334E+20	± 0.23%
-203.50	7.5803E+17	± 3.00%	1.5238E+19	± 0.78%	4.0383E+19	± 0.48%	1.4330E+20	± 0.27%	8.0399E+17	± 1.24%	2.0048E+20	± 0.24%
-253.50	7.2749E+17	± 3.16%	1.5589E+19	± 0.80%	4.0783E+19	± 0.48%	1.4177E+20	± 0.28%	7.8168E+17	± 1.27%	1.9965E+20	± 0.24%
-303.50	6.9877E+17	± 3.25%	1.4849E+19	± 0.80%	3.9408E+19	± 0.48%	1.3848E+20	± 0.28%	7.4217E+17	± 1.27%	1.9418E+20	± 0.24%
-353.50	6.6709E+17	± 3.30%	1.4527E+19	± 0.83%	3.8128E+19	± 0.50%	1.3190E+20	± 0.28%	7.1367E+17	± 1.28%	1.8594E+20	± 0.24%
-410.75	6.6355E+17	± 3.09%	1.4361E+19	± 0.75%	3.8312E+19	± 0.44%	1.2533E+20	± 0.26%	6.6063E+17	± 1.09%	1.7933E+20	± 0.22%
-470.25	6.2455E+17	± 3.31%	1.2980E+19	± 0.85%	3.4448E+19	± 0.50%	1.1277E+20	± 0.30%	5.8417E+17	± 1.20%	1.6140E+20	± 0.25%
-514.75	6.0065E+17	± 3.80%	1.1026E+19	± 1.09%	2.9166E+19	± 0.64%	9.6499E+19	± 0.37%	5.3801E+17	± 1.54%	1.3783E+20	± 0.32%

Table E-17. Five-group Photon Spectrum (m^2s^{-1}) in the Core Support Tube. Normalized to 330 MWt, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 Mev)	Group 2 (2.225 - 6.0 Mev)	Group 3 (1.0 - 2.225 Mev)	Group 4 (50 kev - 1.0 Mev)	Group 5 (Below 50 kev)	Total
2088.45	8.3094E+15	22.13%	7.6779E+15	9.77%	3.4111E+16	7.52%
1820.00	3.9532E+15	28.48%	1.9665E+16	10.97%	7.4653E+16	6.73%
1689.50	b		2.1755E+16	14.07%	1.1132E+17	6.79%
1589.50	b		3.4957E+16	15.63%	2.2035E+17	5.84%
1495.00	6.8648E+15	23.54%	3.4459E+16	15.44%	1.0840E+16	5.60%
1395.00	1.0352E+16	24.50%	4.4196E+16	13.39%	1.7511E+16	4.37%
1302.00	1.1165E+16	21.98%	8.0319E+16	12.67%	6.5349E+17	4.04%
1202.00	1.7082E+16	17.38%	1.2890E+17	7.13%	4.420E+16	2.73%
1095.00	2.5931E+16	14.09%	2.4669E+17	5.68%	1.0554E+16	2.22%
995.00	4.9734E+16	10.67%	4.2209E+17	4.25%	3.4697E+18	1.66%
914.50	7.4303E+16	13.12%	7.4814E+17	4.09%	5.5475E+18	1.61%
864.50	1.0381E+17	11.02%	9.5728E+17	3.95%	7.1780E+18	1.61%
820.00	1.0961E+17	9.55%	1.1645E+18	3.06%	9.3553E+18	1.31%
770.00	1.5575E+17	7.56%	1.5760E+18	2.72%	1.2740E+19	1.13%
720.00	1.8891E+17	6.79%	1.9699E+18	2.34%	1.6723E+19	0.96%
670.00	1.7115E+17	6.93%	2.5946E+18	1.98%	2.9108E+19	0.73%
620.00	2.5471E+17	6.30%	3.2574E+18	1.88%	3.9027E+19	0.58%
563.00	2.6497E+17	5.80%	3.9015E+18	1.56%	3.9027E+19	0.58%
513.50	2.9925E+17	6.01%	4.5381E+18	1.68%	4.7725E+19	0.62%
470.00	3.5493E+17	5.17%	5.4047E+18	1.41%	5.7760E+19	0.51%
420.00	4.0533E+17	5.03%	6.2437E+18	1.32%	6.7603E+19	0.48%
370.00	4.5554E+17	4.61%	7.0178E+18	1.21%	7.5595E+19	0.44%
320.00	4.7038E+17	4.17%	7.7121E+18	1.19%	8.3484E+19	0.43%
270.00	4.8299E+17	4.33%	8.3935E+18	1.12%	9.0758E+19	0.41%
220.00	5.9260E+17	4.14%	8.7848E+18	1.11%	9.6342E+19	0.40%
170.00	6.4414E+17	3.49%	8.9751E+18	1.13%	1.0196E+20	0.38%
125.00	7.7530E+17	3.56%	7.3677E+18	1.38%	1.0755E+20	0.41%
95.00	7.9007E+17	4.36%	6.6509E+18	1.90%	1.0929E+20	0.51%
75.00	7.4464E+17	4.63%	6.3329E+18	2.00%	1.0974E+20	0.50%
55.00	7.9645E+17	4.29%	6.4277E+18	1.97%	1.1215E+20	0.50%
55.00	7.9645E+17	4.29%	6.4277E+18	1.97%	1.1215E+20	0.50%
35.00	7.4287E+17	4.50%	6.1748E+18	1.95%	1.1618E+20	0.58%
20.00	7.0829E+17	6.06%	6.2007E+18	2.28%	1.1879E+20	0.58%
7.50	7.0512E+17	5.32%	6.4417E+18	2.03%	1.2432E+20	0.51%
-7.50	6.9231E+17	5.78%	6.6132E+18	2.04%	1.3084E+20	0.50%
-20.00	6.9402E+17	6.16%	7.2348E+18	2.28%	1.3821E+20	0.55%
-35.00	7.1550E+17	5.36%	8.4277E+18	1.74%	1.4673E+20	0.45%
-55.00	7.1443E+17	6.07%	9.5321E+18	1.71%	1.5546E+20	0.44%
-75.00	6.4420E+17	5.66%	1.0126E+19	1.64%	1.6303E+20	0.43%
-95.00	7.0295E+17	5.32%	1.0656E+19	1.62%	1.6927E+20	0.43%
-125.00	7.2735E+17	4.43%	1.0822E+19	1.29%	1.8429E+20	0.31%
-170.00	6.9688E+17	3.81%	1.1945E+19	1.14%	1.8936E+20	0.30%
-220.00	6.6100E+17	4.19%	1.2818E+19	1.10%		

Table E-17. (Continued)

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-270.00	6.3730E+17	± 4.22%	1.2640E+19	± 1.10%	3.1787E+19	± 0.65%	1.4123E+20	± 0.34%	8.5903E+17	± 2.80%	1.8715E+20	± 0.30%
-320.00	5.8767E+17	± 4.12%	1.2270E+19	± 1.13%	3.0979E+19	± 0.67%	1.3613E+20	± 0.35%	7.9041E+17	± 2.83%	1.8075E+20	± 0.31%
-370.00	5.3667E+17	± 4.03%	1.1337E+19	± 1.13%	2.9545E+19	± 0.68%	1.2876E+20	± 0.36%	7.4910E+17	± 2.95%	1.7093E+20	± 0.32%
-420.00	5.7888E+17	± 4.38%	1.0923E+19	± 1.19%	2.7869E+19	± 0.70%	1.1820E+20	± 0.37%	6.9147E+17	± 3.25%	1.5826E+20	± 0.33%
-470.00	5.4528E+17	± 4.62%	9.6790E+18	± 1.23%	2.4662E+19	± 0.74%	1.0611E+20	± 0.39%	6.5027E+17	± 3.30%	1.4165E+20	± 0.35%
-513.50	5.9131E+17	± 4.76%	8.2078E+18	± 1.48%	2.0501E+19	± 0.90%	9.0143E+19	± 0.48%	6.1618E+17	± 3.66%	1.2006E+20	± 0.41%
-563.50	5.7837E+17	± 3.42%	4.5302E+18	± 1.65%	9.6344E+18	± 1.07%	5.9088E+19	± 0.48%	1.1068E+18	± 2.25%	7.4938E+19	± 0.43%
-620.00	6.3025E+17	± 3.43%	2.8736E+18	± 2.03%	5.1004E+18	± 1.53%	3.5568E+19	± 0.65%	1.2100E+18	± 2.41%	4.5382E+19	± 0.57%
-670.00	6.2510E+17	± 3.40%	2.2368E+18	± 2.20%	3.5808E+18	± 1.68%	2.3869E+19	± 0.76%	9.3349E+17	± 2.67%	3.1245E+19	± 0.66%
-720.00	6.1431E+17	± 3.41%	1.8555E+18	± 2.31%	2.7661E+18	± 1.83%	1.6482E+19	± 0.92%	6.7147E+17	± 2.96%	2.2390E+19	± 0.77%
-770.00	5.4481E+17	± 3.49%	1.5772E+18	± 2.41%	2.0889E+18	± 1.86%	1.1701E+19	± 1.04%	5.4862E+17	± 3.34%	1.6460E+19	± 0.85%
-820.00	5.1020E+17	± 3.70%	1.3113E+18	± 2.55%	1.6726E+18	± 1.94%	8.3753E+18	± 1.18%	4.0217E+17	± 4.47%	1.2272E+19	± 0.95%
-864.50	4.6675E+17	± 4.30%	1.0830E+18	± 2.91%	1.3735E+18	± 2.10%	6.4091E+18	± 1.40%	2.8534E+17	± 4.84%	9.6177E+18	± 1.10%
-914.50	4.0421E+17	± 3.87%	9.4581E+17	± 2.71%	1.1282E+18	± 2.07%	4.9968E+18	± 1.36%	2.2966E+17	± 4.62%	7.7047E+18	± 1.06%
-995.00	2.9778E+17	± 3.65%	7.1339E+17	± 2.77%	8.1339E+17	± 1.66%	3.4376E+18	± 1.37%	1.6025E+17	± 4.31%	5.4224E+18	± 1.06%
-1095.00	2.0960E+17	± 4.36%	5.2495E+17	± 3.02%	5.6484E+17	± 2.05%	2.2244E+18	± 1.64%	9.9881E+16	± 4.40%	3.6237E+18	± 1.24%
-1202.00	1.5509E+17	± 5.01%	3.5491E+17	± 3.29%	3.9334E+17	± 2.20%	1.4446E+18	± 1.70%	6.5827E+16	± 4.95%	2.4137E+18	± 1.32%
-1302.00	1.1657E+17	± 6.56%	2.4329E+17	± 4.18%	2.7450E+17	± 2.52%	9.8608E+17	± 2.29%	3.9661E+16	± 6.45%	1.6601E+18	± 1.72%
-1395.00	8.4696E+16	± 7.12%	1.8329E+17	± 4.90%	2.0291E+17	± 2.61%	7.1627E+17	± 2.69%	3.6840E+16	± 8.33%	1.2240E+18	± 1.99%
-1495.00	5.8116E+16	± 8.96%	1.3186E+17	± 5.32%	1.5479E+17	± 3.37%	5.1405E+17	± 2.99%	2.1501E+16	± 9.53%	8.8032E+17	± 2.23%
-1589.50	3.7680E+16	± 10.55%	1.0196E+17	± 6.37%	1.2163E+17	± 4.16%	3.8004E+17	± 3.41%	1.4601E+16	± 10.61%	6.5591E+17	± 2.58%
-1689.50	2.9518E+16	± 10.25%	7.0603E+16	± 6.95%	8.4275E+16	± 4.31%	2.8580E+17	± 3.45%	1.4869E+16	± 10.80%	4.8507E+17	± 2.67%
-1820.00	1.8705E+16	± 11.86%	4.6340E+16	± 7.97%	4.9474E+16	± 4.66%	1.9336E+17	± 4.08%	9.1369E+15	± 11.48%	3.1702E+17	± 3.13%
-1968.60	1.0842E+16	± 16.06%	2.9593E+16	± 11.03%	3.0881E+16	± 7.24%	1.0894E+17	± 5.47%	5.1729E+15	± 16.23%	1.8542E+17	± 4.30%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-18. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Fuel Element Inner Sideplate. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
533.50	2.8402E+17	± 3.65%	4.1084E+18	± 1.15%	9.4514E+18	± 0.78%	4.3876E+19	± 0.39%	5.9809E+17	± 2.20%	5.8317E+19	± 0.35%
470.00	3.4084E+17	± 4.29%	6.2529E+18	± 1.12%	1.4653E+19	± 0.70%	6.1020E+19	± 0.39%	2.9622E+17	± 3.47%	8.2563E+19	± 0.34%
420.00	3.8593E+17	± 3.87%	7.1890E+18	± 1.06%	1.7039E+19	± 0.67%	6.9007E+19	± 0.37%	3.2071E+17	± 3.42%	9.3942E+19	± 0.32%
370.00	4.3366E+17	± 3.66%	7.9871E+18	± 1.03%	1.8975E+19	± 0.64%	7.6629E+19	± 0.35%	3.6051E+17	± 3.13%	1.0439E+20	± 0.30%
320.00	4.5536E+17	± 3.64%	8.8532E+18	± 0.97%	2.0763E+19	± 0.61%	8.3507E+19	± 0.33%	3.9678E+17	± 3.18%	1.1398E+20	± 0.29%
270.00	4.9166E+17	± 3.31%	9.4262E+18	± 0.95%	2.2217E+19	± 0.59%	9.0189E+19	± 0.32%	4.2834E+17	± 2.99%	1.2275E+20	± 0.28%
220.00	5.3745E+17	± 3.19%	9.8692E+18	± 0.92%	2.3701E+19	± 0.57%	9.5806E+19	± 0.31%	5.0104E+17	± 2.98%	1.3041E+20	± 0.27%
170.00	5.9141E+17	± 3.08%	1.0414E+19	± 0.92%	2.4702E+19	± 0.57%	1.0061E+20	± 0.30%	5.0330E+17	± 2.75%	1.3683E+20	± 0.27%
125.00	6.4340E+17	± 3.24%	1.0361E+19	± 0.97%	2.5293E+19	± 0.61%	1.0569E+20	± 0.32%	5.4253E+17	± 2.81%	1.4253E+20	± 0.28%
95.00	6.9776E+17	± 4.07%	1.0388E+19	± 1.22%	2.5855E+19	± 0.76%	1.0748E+20	± 0.40%	6.0375E+17	± 3.74%	1.4502E+20	± 0.35%
75.00	6.9992E+17	± 3.74%	1.0519E+19	± 1.26%	2.5295E+19	± 0.77%	1.0828E+20	± 0.40%	6.2866E+17	± 3.65%	1.4542E+20	± 0.35%
55.00	6.5512E+17	± 4.02%	9.9224E+18	± 1.24%	2.4613E+19	± 0.77%	1.0824E+20	± 0.40%	6.8560E+17	± 3.58%	1.4412E+20	± 0.35%
35.00	6.5207E+17	± 3.83%	9.0212E+18	± 1.31%	2.2404E+19	± 0.82%	1.0645E+20	± 0.39%	8.5967E+17	± 3.26%	1.3939E+20	± 0.35%
20.00	6.5333E+17	± 4.64%	7.4734E+18	± 1.64%	1.8134E+19	± 1.06%	1.0342E+20	± 0.48%	1.2259E+18	± 3.34%	1.3091E+20	± 0.43%
7.50	6.2192E+17	± 4.02%	6.9182E+18	± 1.52%	1.5720E+19	± 0.99%	1.0062E+20	± 0.43%	1.5620E+18	± 2.68%	1.2544E+20	± 0.39%

Table E-19. Five-group Photon Spectrum (m^2s^{-1}) in the Lower Fuel Element Outer Sideplate. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-7.50	6.4749E+17	± 4.06%	6.8227E+18	± 1.54%	1.5244E+19	± 0.99%	1.0082E+20	± 0.43%	1.6810E+18	± 2.67%	1.2522E+20	± 0.38%
-20.00	6.1679E+17	± 4.57%	7.3225E+18	± 1.66%	1.6314E+19	± 1.05%	1.0304E+20	± 0.47%	1.5604E+18	± 3.11%	1.2886E+20	± 0.42%
-35.00	6.3945E+17	± 3.78%	8.1564E+18	± 1.28%	1.9177E+19	± 0.79%	1.0487E+20	± 0.39%	1.2638E+18	± 2.56%	1.3411E+20	± 0.34%
-55.00	7.2278E+17	± 3.63%	8.7921E+18	± 1.19%	2.1406E+19	± 0.73%	1.0899E+20	± 0.38%	1.1992E+18	± 2.69%	1.4111E+20	± 0.33%
-75.00	7.4227E+17	± 3.42%	9.5072E+18	± 1.16%	2.3109E+19	± 0.71%	1.1321E+20	± 0.38%	1.0999E+18	± 2.88%	1.4767E+20	± 0.33%
-95.00	7.6730E+17	± 3.52%	9.8541E+18	± 1.14%	2.4471E+19	± 0.69%	1.1636E+20	± 0.37%	1.1160E+18	± 2.83%	1.5257E+20	± 0.32%
-125.00	7.6397E+17	± 2.76%	1.0197E+19	± 0.86%	2.5343E+19	± 0.52%	1.1975E+20	± 0.29%	1.0775E+18	± 2.18%	1.5713E+20	± 0.25%
-170.00	7.5994E+17	± 2.59%	1.1075E+19	± 0.75%	2.7840E+19	± 0.46%	1.2518E+20	± 0.26%	1.1036E+18	± 1.96%	1.6596E+20	± 0.23%
-220.00	7.9055E+17	± 2.62%	1.1961E+19	± 0.70%	3.0665E+19	± 0.44%	1.2876E+20	± 0.26%	1.0156E+18	± 1.97%	1.7319E+20	± 0.22%
-270.00	7.0110E+17	± 2.75%	1.2018E+19	± 0.71%	3.0778E+19	± 0.44%	1.2690E+20	± 0.26%	1.0530E+18	± 2.04%	1.7145E+20	± 0.22%
-320.00	6.8423E+17	± 2.79%	1.1492E+19	± 0.74%	2.9678E+19	± 0.44%	1.2282E+20	± 0.27%	9.6775E+17	± 2.14%	1.6564E+20	± 0.23%
-370.00	6.7337E+17	± 2.88%	1.1363E+19	± 0.75%	2.8840E+19	± 0.46%	1.1752E+20	± 0.27%	8.8442E+17	± 2.03%	1.5928E+20	± 0.23%
-420.00	6.2996E+17	± 2.84%	1.0921E+19	± 0.76%	2.8250E+19	± 0.46%	1.1042E+20	± 0.28%	8.3923E+17	± 2.26%	1.5106E+20	± 0.24%
-470.00	6.1922E+17	± 2.87%	9.8082E+18	± 0.78%	2.5411E+19	± 0.48%	9.9878E+19	± 0.30%	7.2614E+17	± 2.33%	1.3644E+20	± 0.25%
-533.50	5.8676E+17	± 2.39%	6.1583E+18	± 0.83%	1.5066E+19	± 0.52%	6.8980E+19	± 0.30%	9.0247E+17	± 1.71%	9.1694E+19	± 0.26%
-608.50	5.8237E+17	± 2.41%	2.7375E+18	± 1.33%	4.8813E+18	± 0.91%	3.3431E+19	± 0.44%	1.2166E+18	± 1.54%	4.2849E+19	± 0.39%
-670.00	5.8189E+17	± 2.81%	2.0256E+18	± 1.69%	3.0562E+18	± 1.25%	2.0972E+19	± 0.62%	9.8880E+17	± 2.10%	2.7625E+19	± 0.53%
-720.00	5.3279E+17	± 2.84%	1.6398E+18	± 1.79%	2.2955E+18	± 1.36%	1.4546E+19	± 0.72%	7.2932E+17	± 2.12%	1.9744E+19	± 0.60%
-770.00	4.6788E+17	± 2.95%	1.4041E+18	± 1.92%	1.7821E+18	± 1.41%	1.0447E+19	± 0.82%	5.6603E+17	± 2.52%	1.4667E+19	± 0.67%
-820.00	4.2232E+17	± 3.20%	1.2299E+18	± 2.08%	1.4972E+18	± 1.59%	7.6914E+18	± 0.94%	4.2184E+17	± 2.91%	1.1263E+19	± 0.76%
-864.50	3.7554E+17	± 3.73%	1.0106E+18	± 2.38%	1.2014E+18	± 1.69%	5.9391E+18	± 1.14%	3.2622E+17	± 3.60%	8.8528E+18	± 0.90%
-914.50	3.2300E+17	± 3.42%	8.0423E+17	± 2.23%	9.8424E+17	± 1.53%	4.6234E+18	± 1.08%	2.5503E+17	± 3.03%	6.9899E+18	± 0.84%
-995.00	2.4904E+17	± 3.11%	6.2962E+17	± 2.17%	7.1821E+17	± 1.40%	3.1235E+18	± 1.06%	1.7281E+17	± 2.82%	4.8932E+18	± 0.82%
-1095.00	2.0138E+17	± 3.70%	4.3902E+17	± 2.62%	4.9479E+17	± 1.51%	1.9732E+18	± 1.28%	1.0716E+17	± 3.42%	3.2156E+18	± 0.97%
-1202.00	1.4034E+17	± 4.27%	3.2016E+17	± 2.80%	3.6194E+17	± 2.07%	1.3452E+18	± 1.42%	7.5164E+16	± 3.96%	2.2428E+18	± 1.11%
-1302.00	9.7420E+16	± 5.49%	2.4276E+17	± 3.52%	2.4934E+17	± 2.33%	8.9657E+17	± 1.79%	4.6363E+16	± 4.78%	1.5325E+18	± 1.38%
-1395.00	6.8484E+16	± 6.33%	1.4959E+17	± 3.80%	1.8166E+17	± 2.65%	6.7217E+17	± 1.94%	3.3242E+16	± 5.21%	1.1051E+18	± 1.51%
-1495.00	5.9790E+16	± 6.47%	1.3278E+17	± 4.64%	1.3967E+17	± 3.14%	4.7512E+17	± 2.14%	2.3896E+16	± 5.75%	8.3126E+17	± 1.72%
-1589.50	4.2473E+16	± 8.71%	9.2605E+16	± 6.10%	9.5840E+16	± 2.95%	3.4231E+17	± 2.62%	1.9838E+16	± 8.78%	5.9307E+17	± 2.10%
-1689.50	3.2216E+16	± 8.04%	6.2225E+16	± 6.24%	6.9795E+16	± 3.23%	2.7008E+17	± 3.02%	1.5583E+16	± 8.56%	4.4990E+17	± 2.30%
-1820.00	1.7191E+16	± 12.31%	4.4777E+16	± 6.68%	4.4999E+16	± 4.87%	1.7670E+17	± 3.16%	1.0636E+16	± 8.99%	2.9430E+17	± 2.60%
-1968.60	1.2324E+16	± 13.86%	2.9123E+16	± 9.52%	2.5226E+16	± 4.37%	1.1379E+17	± 3.67%	5.3154E+15	± 10.92%	1.8578E+17	± 3.13%

Table E-20. Five-group Photon Spectrum (m^2s^{-1}) in the Inner Core Pressure Boundary Tube. Normalized to 330 MWt, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
2088.45	2.369E+15	± 18.05%	7.634E+15	± 10.02%	7.3738E+15	± 6.91%	3.1794E+16	± 5.10%	1.4678E+15	± 13.08%	5.0639E+16	± 4.18%
1820.00	4.5255E+15	± 19.24%	1.4546E+16	± 15.94%	1.4015E+16	± 7.33%	6.7791E+16	± 5.43%	3.7861E+15	± 14.08%	1.0466E+17	± 4.60%
1689.50	4.9595E+15	± 20.72%	2.1079E+16	± 13.29%	2.0931E+16	± 8.69%	1.1074E+17	± 5.38%	5.6650E+15	± 13.43%	1.6338E+17	± 4.44%
1589.50	7.0897E+15	± 19.79%	2.8037E+16	± 10.50%	3.4558E+16	± 9.11%	1.7252E+17	± 4.85%	8.6719E+15	± 14.13%	2.5087E+17	± 4.01%
1495.00	5.8609E+15	± 18.28%	3.5443E+16	± 8.74%	4.7841E+16	± 8.16%	2.3707E+17	± 3.91%	1.0791E+16	± 11.71%	3.3700E+17	± 3.32%
1395.00	8.1185E+15	± 14.88%	5.5906E+16	± 8.48%	7.2565E+16	± 6.04%	3.5823E+17	± 3.25%	1.7904E+16	± 10.23%	5.1272E+17	± 2.74%
1302.00	1.2802E+16	± 16.99%	8.4098E+16	± 8.59%	1.1141E+17	± 5.99%	5.5535E+17	± 2.99%	2.4537E+16	± 9.82%	7.8820E+17	± 2.56%
1202.00	2.2892E+16	± 16.22%	1.3332E+17	± 5.30%	1.7531E+17	± 4.21%	8.7335E+17	± 2.17%	4.1417E+16	± 6.09%	1.2463E+18	± 1.86%
1095.00	3.4937E+16	± 9.23%	2.3323E+17	± 3.77%	3.0682E+17	± 3.53%	1.5108E+18	± 1.78%	7.0722E+16	± 5.58%	2.1565E+18	± 1.49%
995.00	5.5005E+16	± 7.28%	3.8458E+17	± 2.93%	5.2783E+17	± 2.42%	2.5066E+18	± 1.29%	1.2127E+17	± 4.11%	3.5953E+18	± 1.07%
914.50	8.0591E+16	± 6.61%	5.8964E+17	± 2.93%	7.5003E+17	± 2.29%	3.8391E+18	± 1.32%	1.9064E+17	± 4.00%	5.4500E+18	± 1.08%
864.50	1.0689E+17	± 6.82%	7.3412E+17	± 3.15%	1.0148E+18	± 2.50%	4.9286E+18	± 1.32%	2.4506E+17	± 4.20%	7.0295E+18	± 1.10%
820.00	1.4243E+17	± 5.28%	8.5099E+17	± 2.50%	1.1825E+18	± 1.99%	6.2579E+18	± 1.09%	3.0000E+17	± 3.28%	8.7338E+18	± 0.90%
770.00	1.7144E+17	± 4.86%	9.7121E+17	± 2.32%	1.3936E+18	± 1.78%	8.0582E+18	± 0.92%	4.0327E+17	± 2.77%	1.0998E+19	± 0.77%
720.00	2.2308E+17	± 4.44%	1.1049E+18	± 2.14%	1.6697E+18	± 1.63%	1.0355E+19	± 0.80%	5.4261E+17	± 2.53%	1.3895E+19	± 0.68%
670.00	2.7232E+17	± 3.96%	1.4188E+18	± 2.00%	2.1267E+18	± 1.44%	1.3999E+19	± 0.70%	6.8377E+17	± 2.27%	1.8501E+19	± 0.60%
608.50	2.9138E+17	± 3.38%	1.8759E+18	± 1.49%	3.2531E+18	± 1.07%	2.1441E+19	± 0.49%	8.0887E+17	± 1.74%	2.7670E+19	± 0.43%
533.50	3.4928E+17	± 2.89%	3.7871E+18	± 0.90%	9.0405E+18	± 0.57%	4.3433E+19	± 0.32%	5.2682E+17	± 1.89%	5.7136E+19	± 0.28%
470.00	3.9790E+17	± 3.21%	6.0905E+18	± 0.85%	1.5441E+19	± 0.53%	6.4765E+19	± 0.31%	4.3813E+17	± 2.44%	8.7133E+19	± 0.27%
420.00	4.3611E+17	± 3.16%	6.9489E+18	± 0.80%	1.7485E+19	± 0.49%	7.3523E+19	± 0.29%	4.7292E+17	± 2.39%	9.8866E+19	± 0.25%
370.00	4.6964E+17	± 2.92%	7.8399E+18	± 0.75%	2.0004E+19	± 0.46%	8.2781E+19	± 0.28%	5.2882E+17	± 2.44%	1.1162E+20	± 0.24%
320.00	5.3804E+17	± 2.78%	8.7142E+18	± 0.72%	2.1940E+19	± 0.44%	8.9439E+19	± 0.27%	5.4474E+17	± 2.21%	1.2118E+20	± 0.23%
270.00	5.6091E+17	± 2.84%	9.2926E+18	± 0.71%	2.3056E+19	± 0.43%	9.4367E+19	± 0.26%	5.9798E+17	± 2.15%	1.2787E+20	± 0.22%
220.00	5.6712E+17	± 2.66%	9.6553E+18	± 0.69%	2.4370E+19	± 0.42%	9.8675E+19	± 0.26%	6.4525E+17	± 2.15%	1.3391E+20	± 0.22%
170.00	6.2034E+17	± 2.46%	1.0020E+19	± 0.68%	2.5394E+19	± 0.41%	1.0237E+20	± 0.25%	6.3842E+17	± 2.06%	1.3905E+20	± 0.21%
125.00	6.7794E+17	± 2.57%	1.0342E+19	± 0.73%	2.6251E+19	± 0.44%	1.0449E+20	± 0.27%	6.3293E+17	± 2.22%	1.4240E+20	± 0.23%
95.00	6.9917E+17	± 3.21%	1.0251E+19	± 0.93%	2.6314E+19	± 0.57%	1.0552E+20	± 0.33%	6.1568E+17	± 3.07%	1.4340E+20	± 0.28%
75.00	6.9152E+17	± 3.32%	1.0343E+19	± 0.94%	2.5952E+19	± 0.57%	1.0522E+20	± 0.34%	6.1952E+17	± 2.91%	1.4283E+20	± 0.29%
55.00	6.9065E+17	± 3.22%	1.0130E+19	± 0.94%	2.5405E+19	± 0.58%	1.0405E+20	± 0.34%	6.4540E+17	± 2.88%	1.4092E+20	± 0.29%
35.00	7.4787E+17	± 2.97%	9.0058E+18	± 0.97%	2.2473E+19	± 0.61%	9.8609E+19	± 0.34%	7.7115E+17	± 2.87%	1.3161E+20	± 0.30%
20.00	8.0067E+17	± 3.63%	7.0415E+18	± 1.36%	1.6462E+19	± 0.89%	8.9631E+19	± 0.44%	1.0795E+18	± 3.08%	1.1501E+20	± 0.38%
7.50	7.6180E+17	± 3.25%	5.9273E+18	± 1.31%	1.3212E+19	± 0.85%	8.1832E+19	± 0.40%	1.3804E+18	± 2.35%	1.0311E+20	± 0.36%
-7.50	7.5846E+17	± 3.51%	5.5001E+18	± 1.45%	1.1505E+19	± 0.95%	7.6958E+19	± 0.44%	1.7321E+18	± 2.30%	9.6454E+19	± 0.39%
-20.00	7.5738E+17	± 3.92%	5.2988E+18	± 1.65%	1.0746E+19	± 1.11%	7.4593E+19	± 0.50%	1.8491E+18	± 2.55%	9.3244E+19	± 0.44%
-35.00	8.1447E+17	± 3.36%	4.9918E+18	± 1.32%	1.0253E+19	± 0.88%	7.2501E+19	± 0.41%	1.9220E+18	± 1.99%	9.0482E+19	± 0.37%
-55.00	8.2409E+17	± 3.22%	4.9458E+18	± 1.33%	9.8885E+18	± 0.88%	7.1413E+19	± 0.41%	1.9943E+18	± 1.88%	8.9066E+19	± 0.36%
-75.00	8.4671E+17	± 3.17%	4.9050E+18	± 1.31%	9.8764E+18	± 0.85%	7.0935E+19	± 0.42%	1.9683E+18	± 1.93%	8.8532E+19	± 0.37%
-95.00	8.6655E+17	± 2.97%	5.0033E+18	± 1.27%	1.0046E+19	± 0.83%	7.0397E+19	± 0.42%	1.9405E+18	± 1.94%	8.8253E+19	± 0.36%
-125.00	8.5184E+17	± 2.42%	5.1476E+18	± 0.95%	1.0253E+19	± 0.60%	7.0947E+19	± 0.33%	1.9819E+18	± 1.49%	8.9181E+19	± 0.29%
-170.00	8.6279E+17	± 2.30%	5.1815E+18	± 0.84%	1.0575E+19	± 0.52%	7.1605E+19	± 0.30%	1.9895E+18	± 1.36%	9.0214E+19	± 0.26%
-220.00	8.5020E+17	± 2.27%	5.2295E+18	± 0.81%	1.0915E+19	± 0.50%	7.2146E+19	± 0.29%	1.9481E+18	± 1.38%	9.1088E+19	± 0.25%
-270.00	8.4204E+17	± 2.24%	5.2734E+18	± 0.81%	1.0963E+19	± 0.49%	7.1394E+19	± 0.30%	1.9114E+18	± 1.39%	9.0384E+19	± 0.26%

Table E-20. (Continued)

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
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-320.00	8.2233E+17	+	2.36%	5.1199E+18	+	0.82%	1.0622E+19	+	0.50%	6.8939E+19	+	0.30%	1.8132E+18	+	1.40%	8.7317E+19	+	0.26%
-370.00	7.9533E+17	+	2.35%	4.9248E+18	+	0.83%	1.0220E+19	+	0.50%	6.5555E+19	+	0.31%	1.7141E+18	+	1.48%	8.3209E+19	+	0.27%
-420.00	7.3351E+17	+	2.43%	4.5047E+18	+	0.85%	9.4510E+18	+	0.52%	6.0198E+19	+	0.32%	1.5548E+18	+	1.51%	7.6442E+19	+	0.28%
-470.00	6.8184E+17	+	2.52%	4.1241E+18	+	0.91%	8.2285E+18	+	0.54%	5.2327E+19	+	0.34%	1.3876E+18	+	1.57%	6.6749E+19	+	0.30%
-518.50	6.2920E+17	+	2.63%	3.4314E+18	+	1.04%	6.6319E+18	+	0.62%	4.2577E+19	+	0.40%	1.2173E+18	+	1.71%	5.4486E+19	+	0.34%
-568.50	6.1209E+17	+	2.52%	2.8029E+18	+	1.16%	4.7873E+18	+	0.72%	3.1838E+19	+	0.43%	1.0897E+18	+	1.75%	4.1130E+19	+	0.37%
-620.00	6.0721E+17	+	2.66%	2.2413E+18	+	1.35%	3.4964E+18	+	0.91%	2.2802E+19	+	0.52%	9.0644E+17	+	1.83%	3.0053E+19	+	0.44%
-670.00	5.5371E+17	+	2.64%	1.8478E+18	+	1.51%	2.6001E+18	+	1.02%	1.6129E+19	+	0.61%	7.5716E+17	+	2.08%	2.1888E+19	+	0.50%
-720.00	5.2779E+17	+	2.83%	1.5176E+18	+	1.65%	2.0766E+18	+	1.07%	1.1772E+19	+	0.70%	5.4998E+17	+	2.33%	1.6444E+19	+	0.57%
-770.00	4.8320E+17	+	2.87%	1.2979E+18	+	1.83%	1.6604E+18	+	1.17%	8.6753E+18	+	0.80%	4.0966E+17	+	2.54%	1.2526E+19	+	0.64%
-820.00	4.0767E+17	+	3.12%	1.0915E+18	+	1.96%	1.3507E+18	+	1.32%	6.4772E+18	+	0.92%	3.3558E+17	+	2.98%	9.6626E+18	+	0.72%
-864.50	3.6218E+17	+	3.53%	9.2153E+17	+	2.35%	1.1094E+18	+	1.41%	5.0724E+18	+	1.07%	2.5105E+17	+	3.55%	7.7166E+18	+	0.84%
-914.50	3.1251E+17	+	3.31%	7.8788E+17	+	2.15%	9.1072E+17	+	1.38%	3.9954E+18	+	1.06%	1.8978E+17	+	2.93%	6.1963E+18	+	0.81%
-995.00	2.4388E+17	+	3.07%	5.8773E+17	+	2.00%	7.0048E+17	+	1.58%	2.6765E+18	+	1.00%	1.3993E+17	+	2.84%	4.3485E+18	+	0.78%
-1095.00	1.7163E+17	+	3.61%	4.4593E+17	+	2.44%	4.8490E+17	+	1.70%	1.7379E+18	+	1.23%	9.5886E+16	+	3.63%	2.9363E+18	+	0.95%
-1202.00	1.3594E+17	+	4.09%	3.0413E+17	+	2.60%	3.3403E+17	+	1.69%	1.1467E+18	+	1.32%	5.5721E+16	+	3.51%	1.9765E+18	+	1.01%
-1302.00	9.4334E+16	+	5.60%	2.0677E+17	+	3.58%	2.4447E+17	+	2.37%	7.8882E+17	+	1.68%	3.9226E+16	+	4.94%	1.3736E+18	+	1.32%
-1395.00	8.0375E+16	+	5.54%	1.5350E+17	+	3.78%	1.7860E+17	+	2.02%	5.8181E+17	+	1.90%	2.9159E+16	+	5.91%	1.0234E+18	+	1.43%
-1495.00	5.8496E+16	+	6.64%	1.3623E+17	+	4.33%	1.3607E+17	+	2.69%	4.2093E+17	+	2.11%	2.0202E+16	+	6.17%	7.7193E+17	+	1.65%
-1589.50	4.3288E+16	+	7.64%	9.0403E+16	+	5.39%	9.6082E+16	+	2.74%	3.1190E+17	+	2.52%	1.7613E+16	+	7.79%	5.5929E+17	+	1.94%
-1689.50	3.2552E+16	+	7.76%	6.5436E+16	+	5.62%	7.4797E+16	+	3.38%	2.2901E+17	+	2.78%	1.1111E+16	+	9.78%	4.1291E+17	+	2.12%
-1820.00	2.0613E+16	+	9.10%	4.0575E+16	+	5.53%	4.5013E+16	+	3.30%	1.5772E+17	+	2.94%	1.0189E+16	+	9.95%	2.7411E+17	+	2.28%
-1968.60	1.2197E+16	+	11.86%	2.1742E+16	+	7.89%	2.7622E+16	+	4.85%	1.0376E+17	+	3.79%	4.2492E+15	+	11.22%	1.6957E+17	+	2.97%

Table E-21. Five-group Photon Spectrum (m^2s^{-1}) in the Outer Core Pressure Boundary Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
2088.45	2.9299E+15	± 16.75%	7.3629E+15	± 10.50%	7.6509E+15	± 6.48%	3.0420E+16	± 5.20%	1.3349E+15	± 11.42%	4.9699E+16	± 4.12%
1820.00	4.7172E+15	± 17.68%	1.4298E+16	± 10.02%	1.7681E+16	± 9.45%	6.7317E+16	± 4.95%	3.6353E+15	± 14.72%	1.0765E+17	± 4.20%
1689.50	5.0790E+15	± 15.97%	2.2477E+16	± 10.84%	2.3976E+16	± 9.00%	1.1053E+17	± 5.07%	5.0279E+15	± 13.55%	1.6709E+17	± 4.06%
1589.50	6.1400E+15	± 19.29%	3.0081E+16	± 10.03%	3.2084E+16	± 7.19%	1.6390E+17	± 4.35%	7.9804E+15	± 12.52%	2.4019E+17	± 3.60%
1495.00	6.5428E+15	± 16.78%	4.0720E+16	± 9.08%	5.6490E+16	± 7.04%	2.3899E+17	± 3.58%	9.7889E+15	± 10.71%	3.5253E+17	± 3.05%
1395.00	8.2511E+15	± 14.62%	5.3760E+16	± 6.74%	7.2586E+16	± 5.75%	3.5371E+17	± 3.27%	1.6772E+16	± 9.58%	5.0508E+17	± 2.68%
1302.00	1.1557E+16	± 14.89%	8.4817E+16	± 6.63%	1.1411E+17	± 5.83%	5.4164E+17	± 2.72%	2.2017E+16	± 9.18%	7.7415E+17	± 2.33%
1202.00	1.6700E+16	± 10.87%	1.3166E+17	± 4.53%	1.7968E+17	± 4.02%	8.3362E+17	± 2.00%	3.3139E+16	± 5.73%	1.1948E+18	± 1.70%
1095.00	3.3288E+16	± 8.47%	2.3956E+17	± 3.48%	3.1576E+17	± 3.06%	1.4414E+18	± 1.62%	5.6432E+16	± 5.12%	2.0865E+18	± 1.36%
995.00	5.6157E+16	± 6.10%	3.9702E+17	± 2.71%	5.2662E+17	± 2.25%	2.4101E+18	± 1.24%	1.0085E+17	± 3.82%	3.4907E+18	± 1.03%
914.50	9.3434E+16	± 5.72%	5.8980E+17	± 2.55%	7.9513E+17	± 2.23%	3.6484E+18	± 1.22%	1.5524E+17	± 3.96%	5.2820E+18	± 1.01%
864.50	1.1952E+17	± 5.85%	7.4728E+17	± 2.86%	1.0313E+18	± 2.23%	4.7080E+18	± 1.27%	2.0190E+17	± 4.09%	6.8080E+18	± 1.03%
820.00	1.5364E+17	± 4.56%	8.3154E+17	± 2.17%	1.1317E+18	± 1.77%	5.9589E+18	± 1.00%	2.6730E+17	± 3.25%	8.3476E+18	± 0.82%
770.00	1.8305E+17	± 4.54%	9.6870E+17	± 2.14%	1.3063E+18	± 1.57%	7.4554E+18	± 0.88%	3.6183E+17	± 2.83%	1.0275E+19	± 0.73%
720.00	2.2915E+17	± 3.71%	1.0745E+18	± 1.90%	1.5146E+18	± 1.44%	9.7084E+18	± 0.75%	4.8594E+17	± 2.42%	1.3013E+19	± 0.64%
670.00	2.5869E+17	± 3.44%	1.3154E+18	± 1.74%	1.9509E+18	± 1.31%	1.3059E+19	± 0.66%	6.3805E+17	± 2.02%	1.7222E+19	± 0.56%
620.00	2.9141E+17	± 3.32%	1.6073E+18	± 1.53%	2.6154E+18	± 1.14%	1.8200E+19	± 0.55%	7.5769E+17	± 1.81%	2.3472E+19	± 0.48%
568.50	3.1882E+17	± 3.17%	2.1524E+18	± 1.27%	4.1200E+18	± 0.88%	2.6850E+19	± 0.44%	8.6206E+17	± 1.68%	3.4303E+19	± 0.38%
518.50	3.3873E+17	± 3.24%	3.4114E+18	± 1.02%	8.0553E+18	± 0.64%	4.2462E+19	± 0.37%	8.5417E+17	± 1.72%	5.5122E+19	± 0.32%
470.00	3.6294E+17	± 2.96%	4.4941E+18	± 0.85%	1.0932E+19	± 0.53%	5.5109E+19	± 0.31%	1.0021E+18	± 1.60%	7.1900E+19	± 0.27%
420.00	3.9123E+17	± 2.81%	5.2550E+18	± 0.80%	1.2521E+19	± 0.50%	6.3339E+19	± 0.29%	1.1222E+18	± 1.53%	8.2628E+19	± 0.25%
370.00	4.3672E+17	± 2.78%	5.8469E+18	± 0.76%	1.4254E+19	± 0.47%	7.1123E+19	± 0.28%	1.2282E+18	± 1.43%	9.2889E+19	± 0.24%
320.00	4.9931E+17	± 2.50%	6.5355E+18	± 0.72%	1.5644E+19	± 0.45%	7.7041E+19	± 0.27%	1.2968E+18	± 1.40%	1.0102E+20	± 0.23%
270.00	5.1360E+17	± 2.47%	6.9425E+18	± 0.70%	1.6563E+19	± 0.44%	8.1594E+19	± 0.26%	1.3691E+18	± 1.35%	1.0698E+20	± 0.22%
220.00	5.6466E+17	± 2.41%	7.2058E+18	± 0.68%	1.7419E+19	± 0.43%	8.5366E+19	± 0.25%	1.4353E+18	± 1.36%	1.1199E+20	± 0.22%
170.00	6.0179E+17	± 2.32%	7.4481E+18	± 0.68%	1.8186E+19	± 0.42%	8.8496E+19	± 0.25%	1.4880E+18	± 1.33%	1.1622E+20	± 0.21%
125.00	6.4469E+17	± 2.40%	7.7057E+18	± 0.72%	1.8585E+19	± 0.45%	8.9777E+19	± 0.27%	1.5172E+18	± 1.49%	1.1823E+20	± 0.23%
95.00	6.5665E+17	± 3.01%	7.6979E+18	± 0.96%	1.8244E+19	± 0.59%	8.9957E+19	± 0.34%	1.4861E+18	± 2.01%	1.1804E+20	± 0.29%
75.00	6.5898E+17	± 2.94%	7.5659E+18	± 0.96%	1.8161E+19	± 0.60%	8.8867E+19	± 0.34%	1.5175E+18	± 1.96%	1.1677E+20	± 0.29%
55.00	6.8736E+17	± 3.13%	7.2430E+18	± 0.98%	1.7170E+19	± 0.60%	8.6756E+19	± 0.34%	1.5410E+18	± 2.01%	1.1340E+20	± 0.29%
35.00	7.1216E+17	± 2.92%	6.4919E+18	± 1.01%	1.5426E+19	± 0.64%	8.2093E+19	± 0.34%	1.5760E+18	± 1.93%	1.0630E+20	± 0.30%
20.00	7.5197E+17	± 3.43%	5.8975E+18	± 1.36%	1.2956E+19	± 0.89%	7.6910E+19	± 0.44%	1.7317E+18	± 2.38%	9.8247E+19	± 0.38%
7.50	7.2722E+17	± 2.92%	5.1938E+18	± 1.27%	1.1088E+19	± 0.83%	7.2932E+19	± 0.40%	1.8365E+18	± 2.04%	9.1777E+19	± 0.35%
-7.50	7.4331E+17	± 2.98%	4.7835E+18	± 1.30%	1.0056E+19	± 0.87%	6.8625E+19	± 0.41%	1.9448E+18	± 1.89%	8.6153E+19	± 0.36%
-20.00	8.1497E+17	± 3.22%	4.7006E+18	± 1.50%	9.2303E+18	± 1.00%	6.6366E+19	± 0.47%	2.0314E+18	± 2.13%	8.3144E+19	± 0.41%
-35.00	8.0210E+17	± 2.66%	4.5653E+18	± 1.21%	8.8682E+18	± 0.81%	6.4593E+19	± 0.39%	2.0458E+18	± 1.65%	8.0875E+19	± 0.34%
-55.00	8.1779E+17	± 2.58%	4.4371E+18	± 1.21%	8.6483E+18	± 0.80%	6.3081E+19	± 0.39%	2.0921E+18	± 1.61%	7.9076E+19	± 0.34%
-75.00	8.6967E+17	± 2.57%	4.3946E+18	± 1.19%	8.4858E+18	± 0.80%	6.2528E+19	± 0.39%	2.1479E+18	± 1.72%	7.8426E+19	± 0.34%
-95.00	8.5631E+17	± 2.56%	4.4445E+18	± 1.17%	8.7201E+18	± 0.78%	6.2399E+19	± 0.39%	2.1268E+18	± 1.66%	7.8546E+19	± 0.34%
-125.00	8.3109E+17	± 2.04%	4.5566E+18	± 0.89%	8.8122E+18	± 0.58%	6.2695E+19	± 0.31%	2.1346E+18	± 1.25%	7.9029E+19	± 0.27%
-170.00	8.5485E+17	± 1.89%	4.7028E+18	± 0.79%	9.0799E+18	± 0.50%	6.3052E+19	± 0.29%	2.0810E+18	± 1.13%	7.9771E+19	± 0.25%
-220.00	8.3837E+17	± 1.92%	4.6815E+18	± 0.78%	9.4060E+18	± 0.49%	6.3011E+19	± 0.29%	2.0352E+18	± 1.14%	7.9972E+19	± 0.25%

Table E-21. (Continued)

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
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-270.00	8.3270E+17	± 1.96%	4.7102E+18	± 0.77%	9.3992E+18	± 0.48%	6.2338E+19	± 0.29%	1.9465E+18	± 1.15%	7.9226E+19	± 0.25%
-320.00	8.0728E+17	± 1.97%	4.5654E+18	± 0.78%	9.1030E+18	± 0.49%	6.0299E+19	± 0.29%	1.8703E+18	± 1.17%	7.6645E+19	± 0.25%
-370.00	7.7612E+17	± 1.98%	4.3926E+18	± 0.79%	8.7161E+18	± 0.50%	5.7252E+19	± 0.31%	1.7887E+18	± 1.27%	7.2926E+19	± 0.26%
-420.00	7.4303E+17	± 2.09%	3.9943E+18	± 0.82%	8.1024E+18	± 0.51%	5.2235E+19	± 0.31%	1.5982E+18	± 1.24%	6.6673E+19	± 0.27%
-470.00	6.8575E+17	± 2.12%	3.6685E+18	± 0.88%	7.0362E+18	± 0.54%	4.5700E+19	± 0.34%	1.4739E+18	± 1.32%	5.8564E+19	± 0.29%
-518.50	6.5446E+17	± 2.22%	3.1379E+18	± 0.97%	5.7791E+18	± 0.62%	3.7300E+19	± 0.38%	1.2742E+18	± 1.49%	4.8145E+19	± 0.33%
-568.50	6.3459E+17	± 2.19%	2.5770E+18	± 1.05%	4.2569E+18	± 0.68%	2.8258E+19	± 0.42%	1.0745E+18	± 1.50%	3.6801E+19	± 0.35%
-620.00	6.0646E+17	± 2.20%	2.1104E+18	± 1.21%	3.1920E+18	± 0.82%	2.0305E+19	± 0.50%	8.8695E+17	± 1.68%	2.7100E+19	± 0.41%
-670.00	5.7211E+17	± 2.27%	1.7799E+18	± 1.33%	2.4720E+18	± 0.93%	1.4756E+19	± 0.57%	7.1220E+17	± 1.85%	2.0292E+19	± 0.48%
-720.00	5.2103E+17	± 2.38%	1.4328E+18	± 1.45%	1.9577E+18	± 1.01%	1.0808E+19	± 0.67%	5.5782E+17	± 2.08%	1.5277E+19	± 0.54%
-770.00	4.6606E+17	± 2.50%	1.2494E+18	± 1.57%	1.5781E+18	± 1.08%	7.9807E+18	± 0.74%	4.1278E+17	± 2.33%	1.1687E+19	± 0.59%
-820.00	3.9961E+17	± 2.72%	1.0732E+18	± 1.75%	1.2954E+18	± 1.18%	5.9287E+18	± 0.85%	3.2297E+17	± 2.57%	9.0199E+18	± 0.66%
-864.50	3.5892E+17	± 3.09%	8.7854E+17	± 2.01%	1.0729E+18	± 1.37%	4.8529E+18	± 1.03%	2.4244E+17	± 3.05%	7.4057E+18	± 0.78%
-914.50	3.0792E+17	± 2.83%	7.5985E+17	± 1.87%	8.7761E+17	± 1.20%	3.6714E+18	± 0.98%	2.0053E+17	± 2.91%	5.8173E+18	± 0.74%
-995.00	2.3547E+17	± 2.66%	5.7344E+17	± 1.73%	6.6967E+17	± 1.07%	2.5269E+18	± 0.96%	1.4202E+17	± 2.58%	4.1475E+18	± 0.72%
-1095.00	1.7096E+17	± 3.12%	4.0882E+17	± 2.10%	4.6042E+17	± 1.23%	1.6326E+18	± 1.12%	9.4700E+16	± 3.28%	2.7675E+18	± 0.84%
-1202.00	1.3294E+17	± 3.46%	2.8750E+17	± 2.43%	3.1983E+17	± 1.33%	1.0795E+18	± 1.24%	5.9488E+16	± 3.55%	1.8793E+18	± 0.94%
-1302.00	9.1722E+16	± 4.56%	1.9741E+17	± 3.05%	2.2496E+17	± 1.62%	7.6398E+17	± 1.64%	4.1183E+16	± 4.94%	1.3193E+18	± 1.22%
-1395.00	7.5231E+16	± 4.89%	1.5342E+17	± 3.45%	1.7382E+17	± 1.75%	5.5614E+17	± 1.77%	2.6507E+16	± 4.43%	9.8512E+17	± 1.33%
-1495.00	5.7543E+16	± 5.60%	1.2205E+17	± 3.73%	1.2913E+17	± 2.08%	4.0018E+17	± 2.11%	2.0133E+16	± 5.45%	7.2904E+17	± 1.54%
-1589.50	4.0902E+16	± 6.77%	9.6389E+16	± 4.69%	9.6510E+16	± 2.73%	3.0017E+17	± 2.37%	1.6904E+16	± 7.37%	5.5088E+17	± 1.81%
-1689.50	3.5214E+16	± 6.92%	6.7166E+16	± 4.99%	6.8618E+16	± 2.52%	2.1801E+17	± 2.54%	1.0884E+16	± 7.74%	3.9989E+17	± 1.93%
-1820.00	2.1049E+16	± 7.76%	4.5555E+16	± 5.42%	4.5536E+16	± 3.32%	1.5582E+17	± 2.76%	9.1885E+15	± 6.77%	2.7715E+17	± 2.17%
-1968.60	1.1583E+16	± 10.76%	2.3834E+16	± 7.06%	2.6897E+16	± 3.81%	9.8575E+16	± 3.31%	4.7144E+15	± 10.86%	1.6560E+17	± 2.64%

Table E-22. Five-group Photon Spectrum (m^2s^{-1}) in the Central Control Rod 1 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1295.00	b	9.7405E+16 $\pm$ 12.97%	1.4993E+17 $\pm$ 14.02%	1.5722E+17 $\pm$ 9.53%	4.3192E+14 $\pm$ 23.90%	4.1328E+17 $\pm$ 7.65%
1195.00	b	1.4894E+17 $\pm$ 13.05%	1.9992E+17 $\pm$ 9.92%	2.6582E+17 $\pm$ 7.98%	5.3869E+14 $\pm$ 22.67%	6.2010E+17 $\pm$ 6.24%
1095.00	1.8954E+16 $\pm$ 23.32%	3.0449E+17 $\pm$ 9.38%	3.7965E+17 $\pm$ 8.51%	4.6882E+17 $\pm$ 6.15%	7.7157E+14 $\pm$ 17.65%	1.1727E+18 $\pm$ 4.87%
995.00	3.3127E+16 $\pm$ 18.50%	5.5090E+17 $\pm$ 6.30%	7.0024E+17 $\pm$ 5.33%	9.2060E+17 $\pm$ 4.43%	1.1840E+15 $\pm$ 12.94%	2.2060E+18 $\pm$ 3.33%
895.00	6.7786E+16 $\pm$ 15.80%	1.1913E+18 $\pm$ 4.57%	1.5246E+18 $\pm$ 3.81%	1.6555E+18 $\pm$ 3.24%	2.7774E+15 $\pm$ 9.35%	4.4419E+18 $\pm$ 2.43%
820.00	8.4970E+16 $\pm$ 17.55%	2.0496E+18 $\pm$ 4.71%	2.8914E+18 $\pm$ 4.13%	2.6689E+18 $\pm$ 3.35%	3.8082E+15 $\pm$ 13.22%	7.6987E+18 $\pm$ 2.56%
770.00	1.1563E+17 $\pm$ 16.70%	2.7598E+18 $\pm$ 3.93%	3.6298E+18 $\pm$ 3.48%	3.8049E+18 $\pm$ 2.95%	5.5703E+15 $\pm$ 10.65%	1.0316E+19 $\pm$ 2.15%
720.00	1.2289E+17 $\pm$ 13.77%	3.5293E+18 $\pm$ 3.69%	4.7770E+18 $\pm$ 2.96%	4.9945E+18 $\pm$ 2.53%	7.3622E+15 $\pm$ 9.96%	1.3431E+19 $\pm$ 1.89%
670.00	1.9632E+17 $\pm$ 11.93%	4.6832E+18 $\pm$ 3.04%	6.3753E+18 $\pm$ 2.59%	6.7947E+18 $\pm$ 2.22%	9.7391E+15 $\pm$ 8.37%	1.8059E+19 $\pm$ 1.63%
620.00	2.4228E+17 $\pm$ 11.15%	5.9834E+18 $\pm$ 2.79%	7.8347E+18 $\pm$ 2.36%	8.7034E+18 $\pm$ 1.88%	1.1064E+16 $\pm$ 6.32%	2.2775E+19 $\pm$ 1.45%
570.00	2.2657E+17 $\pm$ 12.29%	6.8444E+18 $\pm$ 2.49%	9.8516E+18 $\pm$ 2.09%	1.1279E+19 $\pm$ 1.63%	1.3496E+16 $\pm$ 5.59%	2.8215E+19 $\pm$ 1.28%
520.00	2.5930E+17 $\pm$ 9.71%	7.5136E+18 $\pm$ 2.27%	1.1233E+19 $\pm$ 1.90%	1.3925E+19 $\pm$ 1.40%	1.7624E+16 $\pm$ 5.91%	3.2949E+19 $\pm$ 1.13%
470.00	3.4548E+17 $\pm$ 10.28%	9.2135E+18 $\pm$ 2.10%	1.3122E+19 $\pm$ 1.71%	1.7361E+19 $\pm$ 1.27%	1.8480E+16 $\pm$ 4.91%	4.0060E+19 $\pm$ 1.02%
420.00	3.4916E+17 $\pm$ 8.64%	1.0351E+19 $\pm$ 1.97%	1.5152E+19 $\pm$ 1.55%	2.0192E+19 $\pm$ 1.19%	2.1199E+16 $\pm$ 4.22%	4.6065E+19 $\pm$ 0.95%
370.00	4.8262E+17 $\pm$ 10.62%	1.1851E+19 $\pm$ 1.81%	1.7504E+19 $\pm$ 1.49%	2.2815E+19 $\pm$ 1.10%	2.5947E+16 $\pm$ 4.51%	5.2678E+19 $\pm$ 0.89%
320.00	4.1899E+17 $\pm$ 7.74%	1.3270E+19 $\pm$ 1.71%	1.9296E+19 $\pm$ 1.41%	2.5153E+19 $\pm$ 1.04%	2.7213E+16 $\pm$ 4.69%	5.8165E+19 $\pm$ 0.84%
270.00	4.8333E+17 $\pm$ 7.84%	1.4331E+19 $\pm$ 1.68%	2.0296E+19 $\pm$ 1.35%	2.6982E+19 $\pm$ 1.00%	3.0746E+16 $\pm$ 3.92%	6.2123E+19 $\pm$ 0.81%
220.00	5.6792E+17 $\pm$ 7.76%	1.5527E+19 $\pm$ 1.59%	2.2727E+19 $\pm$ 1.30%	2.9558E+19 $\pm$ 0.98%	3.6317E+16 $\pm$ 4.27%	6.8416E+19 $\pm$ 0.78%
170.00	7.4015E+17 $\pm$ 6.45%	1.8666E+19 $\pm$ 1.52%	2.6809E+19 $\pm$ 1.23%	3.3245E+19 $\pm$ 0.91%	4.2797E+16 $\pm$ 3.85%	7.9503E+19 $\pm$ 0.75%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-23. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Central Control Rod 1 Al-6061 Support Tube. Normalized to 330 MWt, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
2188.45	b	b	6.9182E+15	2.5240E+16	b	4.0278E+16
1995.00	b	b	1.1001E+16	2.9589E+16	b	5.4619E+16
1820.00	b	b	1.3671E+16	7.0169E+16	b	1.1133E+17
1695.00	b	b	1.9742E+16	9.7358E+16	b	1.5208E+17
1595.00	b	b	2.6604E+16	1.5820E+17	b	2.3205E+17
1495.00	b	b	4.2027E+16	2.3450E+17	b	3.1819E+17
1395.00	b	b	5.7022E+16	2.6786E+17	b	3.8080E+17
1295.00	b	b	1.0961E+17	1.5133E+17	b	3.3579E+17
1195.00	b	b	1.7452E+17	3.6144E+17	b	6.5666E+17
1095.00	b	b	3.1795E+17	5.3675E+17	b	1.0580E+18
995.00	2.2566E+16	4.3667E+17	6.9812E+17	1.0349E+18	b	2.1939E+18
895.00	5.9420E+16	9.9976E+17	1.2721E+18	2.0119E+18	b	4.3479E+18
820.00	7.0881E+16	1.7033E+18	2.4297E+18	3.1665E+18	b	7.3766E+18
770.00	1.0415E+17	2.1572E+18	3.1534E+18	4.1728E+18	b	9.6020E+18
720.00	1.1089E+17	2.8268E+18	4.1160E+18	5.8599E+18	b	1.2950E+19
670.00	1.6059E+17	3.4997E+18	5.2659E+18	7.5301E+18	b	1.6692E+19
620.00	2.3055E+17	4.6572E+18	6.3512E+18	1.0189E+19	2.3.28%	2.1463E+19
570.00	2.0512E+17	5.7864E+18	7.9627E+18	1.2950E+19	2.2.30%	2.6955E+19
520.00	2.6101E+17	6.5141E+18	9.6799E+18	1.6552E+19	2.2.05%	3.3060E+19
470.00	3.1134E+17	7.5350E+18	1.1283E+19	2.0399E+19	1.8.3%	3.9615E+19
420.00	3.1786E+17	8.1999E+18	1.3289E+19	2.3666E+19	1.7.0%	4.5593E+19
370.00	3.8533E+17	9.6452E+18	1.4677E+19	2.782E+19	1.6.1%	5.1976E+19
320.00	3.5500E+17	1.0622E+19	1.6416E+19	2.9537E+19	1.5.0%	5.7034E+19
270.00	4.4778E+17	1.1906E+19	1.7418E+19	3.2142E+19	1.4.5%	6.2041E+19
220.00	5.4954E+17	1.2945E+19	1.9394E+19	3.4601E+19	1.3.6%	6.7664E+19
170.00	6.9587E+17	1.3583E+19	2.0494E+19	3.7422E+19	8.4.2%	7.8538E+19
125.00	7.4879E+17	8.3634E+18	1.4968E+19	7.5022E+19	9.9.36E+17	1.0010E+20
95.00	7.1015E+17	6.5015E+18	1.2268E+19	8.3445E+19	1.4.42E+18	1.0370E+20
75.00	7.0248E+17	6.2832E+18	1.1830E+19	8.6380E+19	1.3.79E+18	1.0635E+20
55.00	7.4861E+17	5.9066E+18	1.1536E+19	8.8372E+19	1.4.68E+18	1.0809E+20
35.00	8.0561E+17	5.9009E+18	1.2171E+19	9.2092E+19	1.5.23E+18	1.1244E+20
20.00	7.5410E+17	5.9009E+18	1.2681E+19	9.5410E+19	1.6.08E+18	1.1672E+20
7.50	8.2226E+17	6.2719E+18	1.3076E+19	1.0025E+20	1.6.22E+18	1.2201E+20
-7.50	7.8512E+17	6.3146E+18	1.4243E+19	1.0314E+20	1.4.10E+18	1.2595E+20
-20.00	8.0125E+17	6.3146E+18	1.5445E+19	1.0717E+20	1.5.61E+18	1.3176E+20
-35.00	8.0099E+17	6.7835E+18	1.5850E+19	1.1326E+20	1.5.04E+18	1.3849E+20
-55.00	7.7224E+17	7.1004E+18	1.5850E+19	1.1326E+20	1.5.04E+18	1.4576E+20
-75.00	7.1754E+17	7.8896E+18	1.7545E+19	1.1813E+20	1.4.763E+18	1.4972E+20
-95.00	7.6279E+17	7.3151E+18	1.8488E+19	1.2667E+20	1.5.360E+18	1.5642E+20
-125.00	6.6736E+17	8.3402E+18	1.9220E+19	1.3142E+20	1.5.235E+18	1.6268E+20
-170.00	6.6247E+17	8.8053E+18	2.0281E+19	1.3142E+20	1.5.104E+18	1.6673E+20
-220.00	7.0175E+17	8.9848E+18	2.1282E+19	1.3425E+20	1.5.075E+18	1.6673E+20

Table E-23. (Continued)

-270.00	6.2982E+17 ±	6.01%	8.8520E+18 ±	1.99%	2.2066E+19 ±	1.23%	1.3443E+20 ±	0.58%	1.4918E+18 ±	3.50%	1.6747E+20 ±	0.53%
-320.00	6.2722E+17 ±	6.59%	8.9099E+18 ±	2.02%	2.1069E+19 ±	1.24%	1.3026E+20 ±	0.59%	1.4192E+18 ±	3.63%	1.6229E+20 ±	0.53%
-370.00	6.7109E+17 ±	6.40%	8.1850E+18 ±	2.07%	1.9903E+19 ±	1.26%	1.2051E+20 ±	0.61%	1.3103E+18 ±	3.84%	1.5058E+20 ±	0.54%
-420.00	5.4620E+17 ±	6.65%	7.8772E+18 ±	2.16%	1.8448E+19 ±	1.31%	1.1139E+20 ±	0.64%	1.1804E+18 ±	3.84%	1.3944E+20 ±	0.57%
-470.00	6.0952E+17 ±	6.07%	7.0796E+18 ±	2.23%	1.6601E+19 ±	1.41%	9.8289E+19 ±	0.68%	1.0926E+18 ±	4.32%	1.2367E+20 ±	0.61%
-520.00	6.2581E+17 ±	6.02%	5.4829E+18 ±	2.46%	1.2844E+19 ±	1.61%	7.8008E+19 ±	0.76%	1.0800E+18 ±	4.46%	9.8040E+19 ±	0.68%
-570.00	7.0355E+17 ±	5.84%	3.9412E+18 ±	2.78%	7.9944E+18 ±	1.88%	5.4000E+19 ±	0.89%	9.0132E+17 ±	4.44%	6.7540E+19 ±	0.79%
-620.00	7.6539E+17 ±	4.92%	3.1076E+18 ±	2.93%	5.3791E+18 ±	2.23%	3.5603E+19 ±	1.08%	7.4308E+17 ±	4.52%	4.5599E+19 ±	0.94%
-670.00	7.2991E+17 ±	5.08%	2.5845E+18 ±	3.12%	3.8065E+18 ±	2.36%	2.4130E+19 ±	1.29%	5.5703E+17 ±	5.59%	3.1808E+19 ±	1.09%
-720.00	6.5402E+17 ±	5.25%	2.1228E+18 ±	3.15%	2.9269E+18 ±	2.42%	1.6384E+19 ±	1.56%	4.2551E+17 ±	5.89%	2.2513E+19 ±	1.26%
-770.00	6.0757E+17 ±	5.43%	1.8435E+18 ±	3.36%	2.2081E+18 ±	2.47%	1.1285E+19 ±	1.74%	3.0494E+17 ±	6.38%	1.6249E+19 ±	1.36%
-820.00	5.6586E+17 ±	5.72%	1.5447E+18 ±	3.81%	1.9210E+18 ±	2.87%	8.4984E+18 ±	2.02%	2.7163E+17 ±	8.68%	1.2802E+19 ±	1.57%
-895.00	4.5614E+17 ±	4.87%	1.2102E+18 ±	3.63%	1.4163E+18 ±	2.33%	5.5236E+18 ±	1.84%	1.4310E+17 ±	6.26%	8.7493E+18 ±	1.41%
-995.00	3.5786E+17 ±	5.57%	7.7677E+17 ±	3.89%	9.3300E+17 ±	2.65%	3.4790E+18 ±	2.20%	8.5470E+16 ±	7.33%	5.6321E+18 ±	1.64%
-1095.00	2.3321E+17 ±	7.04%	5.4673E+17 ±	5.13%	6.5780E+17 ±	2.71%	2.2730E+18 ±	2.52%	5.9814E+16 ±	8.26%	3.7705E+18 ±	1.90%
-1195.00	1.7504E+17 ±	8.19%	4.2739E+17 ±	5.09%	4.5336E+17 ±	3.60%	1.4214E+18 ±	2.92%	3.9107E+16 ±	9.15%	2.5163E+18 ±	2.18%
-1295.00	1.3464E+17 ±	8.68%	2.9818E+17 ±	6.27%	3.1946E+17 ±	3.41%	1.0087E+18 ±	3.45%	2.8155E+16 ±	9.91%	1.7891E+18 ±	2.52%
-1395.00	1.0656E+17 ±	10.79%	2.1872E+17 ±	7.30%	2.2577E+17 ±	3.71%	7.6002E+17 ±	4.09%	1.9779E+16 ±	12.02%	1.3309E+18 ±	3.01%
-1495.00	6.3569E+16 ±	12.17%	1.5796E+17 ±	8.68%	1.7464E+17 ±	4.78%	5.3267E+17 ±	4.64%	1.8530E+16 ±	17.60%	9.4736E+17 ±	3.42%
-1595.00	3.7605E+16 ±	15.29%	1.0867E+17 ±	10.65%	1.4054E+17 ±	6.11%	4.0641E+17 ±	5.64%	1.2152E+16 ±	19.87%	7.0538E+17 ±	4.23%
-1695.00	4.5889E+16 ±	15.12%	8.6626E+16 ±	11.83%	9.4828E+16 ±	7.25%	2.9174E+17 ±	6.43%	7.5403E+15 ±	19.26%	5.2662E+17 ±	4.79%
-1820.00	2.0027E+16 ±	20.04%	4.9767E+16 ±	12.77%	5.2775E+16 ±	7.50%	1.9355E+17 ±	7.24%	6.2205E+15 ±	26.68%	3.2234E+17 ±	5.44%
-1968.60	1.3367E+16 ±	23.73%	3.2238E+16 ±	17.02%	3.2973E+16 ±	9.22%	1.0156E+17 ±	8.48%	2.7399E+15 ±	26.08%	1.8288E+17 ±	6.41%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-24. Five-group Photon Spectrum (m^2s^{-1}) in the Central Control Rod 2 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1295.00	b	1.0000E+17 $\pm$ 13.91%	1.1226E+17 $\pm$ 12.45%	1.4972E+17 $\pm$ 8.78%	2.7004E+14 $\pm$ 24.79%	3.6944E+17 $\pm$ 7.23%
1195.00	b	1.2391E+17 $\pm$ 11.23%	2.1341E+17 $\pm$ 10.40%	2.5446E+17 $\pm$ 7.91%	7.2815E+14 $\pm$ 21.94%	6.0377E+17 $\pm$ 6.10%
1095.00	2.4185E+16 $\pm$ 25.21%	2.7971E+17 $\pm$ 9.24%	3.8980E+17 $\pm$ 7.47%	4.5456E+17 $\pm$ 5.86%	1.0202E+15 $\pm$ 20.64%	1.1493E+18 $\pm$ 4.51%
995.00	2.2212E+16 $\pm$ 22.88%	5.8632E+17 $\pm$ 6.97%	8.1369E+17 $\pm$ 5.51%	8.6388E+17 $\pm$ 4.43%	1.4670E+15 $\pm$ 14.26%	2.2876E+18 $\pm$ 3.46%
895.00	5.6757E+16 $\pm$ 15.84%	1.2351E+18 $\pm$ 4.48%	1.5163E+18 $\pm$ 3.89%	1.5904E+18 $\pm$ 3.20%	2.4525E+15 $\pm$ 12.40%	4.4011E+18 $\pm$ 2.42%
820.00	5.6558E+16 $\pm$ 19.12%	2.0473E+18 $\pm$ 4.59%	2.6122E+18 $\pm$ 4.29%	2.5368E+18 $\pm$ 3.43%	4.3689E+15 $\pm$ 10.53%	7.2573E+18 $\pm$ 2.57%
770.00	1.0594E+17 $\pm$ 16.37%	2.8134E+18 $\pm$ 4.04%	3.5473E+18 $\pm$ 3.67%	3.5853E+18 $\pm$ 2.97%	4.6183E+15 $\pm$ 9.02%	1.0057E+19 $\pm$ 2.24%
720.00	1.1135E+17 $\pm$ 13.73%	3.4931E+18 $\pm$ 3.55%	4.8893E+18 $\pm$ 3.05%	4.9490E+18 $\pm$ 2.54%	6.8795E+15 $\pm$ 7.58%	1.3450E+19 $\pm$ 1.90%
670.00	1.4074E+17 $\pm$ 12.98%	4.7014E+18 $\pm$ 3.15%	6.2945E+18 $\pm$ 2.61%	6.5693E+18 $\pm$ 2.18%	1.2174E+16 $\pm$ 10.10%	1.7718E+19 $\pm$ 1.66%
620.00	1.8902E+17 $\pm$ 10.94%	5.5482E+18 $\pm$ 2.76%	7.7425E+18 $\pm$ 2.42%	8.6117E+18 $\pm$ 1.87%	1.1539E+16 $\pm$ 6.41%	2.2103E+19 $\pm$ 1.46%
570.00	2.3973E+17 $\pm$ 10.58%	6.9880E+18 $\pm$ 2.49%	9.8113E+18 $\pm$ 2.09%	1.1159E+19 $\pm$ 1.67%	1.3785E+16 $\pm$ 5.64%	2.8212E+19 $\pm$ 1.29%
520.00	2.4639E+17 $\pm$ 12.07%	7.6326E+18 $\pm$ 2.33%	1.1247E+19 $\pm$ 1.86%	1.4135E+19 $\pm$ 1.43%	1.6013E+16 $\pm$ 5.29%	3.3277E+19 $\pm$ 1.14%
470.00	3.2517E+17 $\pm$ 8.93%	8.5451E+18 $\pm$ 2.12%	1.2839E+19 $\pm$ 1.74%	1.7049E+19 $\pm$ 1.29%	1.8884E+16 $\pm$ 5.12%	3.8777E+19 $\pm$ 1.04%
420.00	3.5031E+17 $\pm$ 8.74%	1.0206E+19 $\pm$ 1.98%	1.4913E+19 $\pm$ 1.60%	2.0760E+19 $\pm$ 1.21%	2.1285E+16 $\pm$ 4.60%	4.6250E+19 $\pm$ 0.97%
370.00	4.5701E+17 $\pm$ 8.31%	1.1812E+19 $\pm$ 1.80%	1.6956E+19 $\pm$ 1.49%	2.2945E+19 $\pm$ 1.10%	2.6050E+16 $\pm$ 4.92%	5.2197E+19 $\pm$ 0.88%
320.00	4.1614E+17 $\pm$ 7.65%	1.3042E+19 $\pm$ 1.75%	1.8845E+19 $\pm$ 1.43%	2.4974E+19 $\pm$ 1.05%	2.7870E+16 $\pm$ 4.46%	5.7305E+19 $\pm$ 0.86%
270.00	4.8280E+17 $\pm$ 7.44%	1.4232E+19 $\pm$ 1.66%	2.0087E+19 $\pm$ 1.35%	2.7082E+19 $\pm$ 1.01%	3.0530E+16 $\pm$ 4.40%	6.1914E+19 $\pm$ 0.82%
220.00	6.2681E+17 $\pm$ 7.06%	1.5518E+19 $\pm$ 1.61%	2.2459E+19 $\pm$ 1.28%	2.9016E+19 $\pm$ 0.98%	3.3326E+16 $\pm$ 4.13%	6.7653E+19 $\pm$ 0.79%
170.00	7.6817E+17 $\pm$ 6.65%	1.8066E+19 $\pm$ 1.53%	2.6653E+19 $\pm$ 1.23%	3.3013E+19 $\pm$ 0.94%	4.0420E+16 $\pm$ 3.34%	7.8540E+19 $\pm$ 0.76%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-25. Five-group Photon Spectrum (m^2s^{-1}) in the Central Control Rod 2 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
2188.45	b	b	5.2351E+15 ± 16.41%	2.6248E+16 ± 17.76%	b	3.9278E+16 ± 14.61%
1995.00	b	9.7396E+15 ± 24.82%	7.8347E+15 ± 16.29%	3.7570E+16 ± 15.09%	b	5.9142E+16 ± 11.44%
1820.00	b	9.5990E+15 ± 27.76%	1.3538E+16 ± 16.00%	5.5572E+16 ± 15.15%	b	8.3196E+16 ± 12.71%
1695.00	b	2.1586E+16 ± 22.83%	1.6526E+16 ± 24.01%	8.8332E+16 ± 14.62%	b	1.3488E+17 ± 11.11%
1595.00	b	2.2659E+16 ± 24.00%	3.0665E+16 ± 27.14%	1.3313E+17 ± 12.61%	b	1.9634E+17 ± 11.13%
1495.00	b	2.5172E+16 ± 27.18%	4.2645E+16 ± 19.09%	1.8994E+17 ± 11.63%	b	2.7299E+17 ± 9.48%
1395.00	b	4.5409E+16 ± 22.27%	5.8062E+16 ± 15.29%	2.6854E+17 ± 9.99%	b	3.8388E+17 ± 8.31%
1295.00	b	7.2201E+16 ± 19.81%	7.6211E+16 ± 16.96%	1.7019E+17 ± 17.34%	b	3.3274E+17 ± 11.15%
1195.00	b	1.5816E+17 ± 17.61%	1.9424E+17 ± 15.11%	3.0796E+17 ± 12.54%	b	6.7440E+17 ± 9.22%
1095.00	b	2.1947E+17 ± 14.02%	3.5504E+17 ± 10.32%	4.8027E+17 ± 9.28%	b	1.0854E+18 ± 6.28%
995.00	2.0310E+16 ± 24.73%	4.7838E+17 ± 9.45%	6.4264E+17 ± 7.78%	9.9112E+17 ± 6.61%	b	2.1366E+18 ± 4.67%
895.00	5.3009E+16 ± 19.84%	1.0317E+18 ± 6.23%	1.2898E+18 ± 5.55%	1.8516E+18 ± 4.67%	b	4.2295E+18 ± 3.25%
820.00	8.7580E+16 ± 24.34%	1.7497E+18 ± 6.26%	2.0646E+18 ± 5.52%	3.0995E+18 ± 5.07%	b	7.0095E+18 ± 3.33%
770.00	8.7332E+16 ± 20.26%	2.2667E+18 ± 5.29%	2.8609E+18 ± 4.69%	4.4027E+18 ± 4.27%	b	9.6266E+18 ± 2.83%
720.00	1.1740E+17 ± 17.31%	2.9409E+18 ± 4.89%	3.7997E+18 ± 3.98%	5.8074E+18 ± 3.75%	b	1.2698E+19 ± 2.50%
670.00	1.0537E+17 ± 18.67%	3.7430E+18 ± 4.23%	4.9486E+18 ± 3.48%	7.8476E+18 ± 3.14%	b	1.6686E+19 ± 2.16%
620.00	2.1138E+17 ± 17.26%	4.5260E+18 ± 3.75%	6.3714E+18 ± 3.02%	1.0097E+19 ± 2.76%	b	2.1256E+19 ± 1.89%
570.00	2.5218E+17 ± 16.75%	5.4924E+18 ± 3.32%	7.9518E+18 ± 2.73%	1.2613E+19 ± 2.28%	6.4512E+16 ± 27.00%	2.6374E+19 ± 1.63%
520.00	2.3027E+17 ± 12.39%	6.0992E+18 ± 3.08%	9.0941E+18 ± 2.43%	1.6791E+19 ± 2.05%	9.9309E+16 ± 21.75%	3.2314E+19 ± 1.47%
470.00	2.8302E+17 ± 11.75%	7.3678E+18 ± 2.76%	1.0540E+19 ± 2.24%	1.9990E+19 ± 1.84%	5.6094E+16 ± 17.83%	3.8237E+19 ± 1.33%
420.00	3.0429E+17 ± 10.60%	8.4723E+18 ± 2.58%	1.2451E+19 ± 2.05%	2.3671E+19 ± 1.68%	9.2974E+16 ± 18.18%	4.4991E+19 ± 1.22%
370.00	4.3820E+17 ± 10.08%	9.7371E+18 ± 2.43%	1.4265E+19 ± 1.94%	2.6788E+19 ± 1.56%	1.3140E+17 ± 17.39%	5.1359E+19 ± 1.14%
320.00	4.3307E+17 ± 9.98%	1.0701E+19 ± 2.26%	1.5903E+19 ± 1.82%	2.9457E+19 ± 1.49%	1.1457E+17 ± 15.19%	5.6609E+19 ± 1.08%
270.00	5.0310E+17 ± 9.85%	1.1414E+19 ± 2.16%	1.7059E+19 ± 1.76%	3.1177E+19 ± 1.44%	1.1434E+17 ± 15.02%	6.0267E+19 ± 1.04%
220.00	5.0737E+17 ± 9.81%	1.2518E+19 ± 2.16%	1.8827E+19 ± 1.66%	3.4444E+19 ± 1.36%	1.8159E+17 ± 13.49%	6.6477E+19 ± 0.99%
170.00	7.0967E+17 ± 8.42%	1.3309E+19 ± 2.12%	2.0265E+19 ± 1.62%	4.4520E+19 ± 1.24%	3.6639E+17 ± 9.45%	7.9170E+19 ± 0.94%
125.00	7.1818E+17 ± 6.48%	8.1642E+18 ± 2.30%	1.4118E+19 ± 1.68%	7.4223E+19 ± 0.84%	9.9752E+17 ± 4.62%	9.8220E+19 ± 0.74%
95.00	7.5266E+17 ± 7.13%	5.9517E+18 ± 3.07%	1.2295E+19 ± 2.19%	8.1391E+19 ± 0.97%	1.1779E+18 ± 5.39%	1.0157E+20 ± 0.86%
75.00	7.3724E+17 ± 7.16%	5.9121E+18 ± 3.22%	1.1640E+19 ± 2.22%	8.3331E+19 ± 0.94%	1.4635E+18 ± 5.54%	1.0308E+20 ± 0.85%
55.00	7.3650E+17 ± 7.16%	6.0298E+18 ± 3.23%	1.1765E+19 ± 2.23%	8.5930E+19 ± 0.94%	1.4720E+18 ± 5.13%	1.0593E+20 ± 0.84%
35.00	6.7126E+17 ± 6.91%	5.5190E+18 ± 3.25%	1.1389E+19 ± 2.20%	9.0013E+19 ± 0.91%	1.5192E+18 ± 5.14%	1.0911E+20 ± 0.82%
20.00	7.3084E+17 ± 8.78%	5.4114E+18 ± 3.57%	1.2047E+19 ± 2.47%	9.2149E+19 ± 1.08%	1.5336E+18 ± 6.95%	1.1187E+20 ± 0.97%
7.50	7.2965E+17 ± 8.08%	6.1414E+18 ± 3.34%	1.2708E+19 ± 2.27%	9.4526E+19 ± 0.95%	1.5609E+18 ± 5.63%	1.1567E+20 ± 0.86%
-7.50	7.7346E+17 ± 8.11%	6.1369E+18 ± 3.19%	1.3060E+19 ± 2.15%	1.0012E+20 ± 0.94%	1.5051E+18 ± 5.59%	1.2160E+20 ± 0.85%
-20.00	7.0126E+17 ± 8.24%	6.5567E+18 ± 3.63%	1.3964E+19 ± 2.42%	1.0263E+20 ± 1.03%	1.4434E+18 ± 6.28%	1.2530E+20 ± 0.92%
-35.00	7.1452E+17 ± 7.29%	6.6911E+18 ± 3.06%	1.4932E+19 ± 1.98%	1.0688E+20 ± 0.85%	1.3741E+18 ± 4.62%	1.3059E+20 ± 0.76%
-55.00	6.4177E+17 ± 8.68%	7.2751E+18 ± 2.99%	1.5901E+19 ± 1.90%	1.1259E+20 ± 0.84%	1.4137E+18 ± 5.41%	1.3782E+20 ± 0.76%
-75.00	7.0377E+17 ± 8.29%	7.3616E+18 ± 2.97%	1.7192E+19 ± 1.85%	1.1721E+20 ± 0.82%	1.4901E+18 ± 5.00%	1.4396E+20 ± 0.74%
-95.00	7.0242E+17 ± 7.55%	8.0756E+18 ± 2.84%	1.8641E+19 ± 1.82%	1.1893E+20 ± 0.81%	1.5430E+18 ± 5.10%	1.4790E+20 ± 0.73%
-125.00	7.1265E+17 ± 6.18%	8.2470E+18 ± 2.26%	1.9048E+19 ± 1.40%	1.2521E+20 ± 0.65%	1.5625E+18 ± 4.00%	1.5479E+20 ± 0.58%
-170.00	6.9521E+17 ± 5.70%	8.8498E+18 ± 1.96%	2.0101E+19 ± 1.26%	1.3228E+20 ± 0.59%	1.5445E+18 ± 3.37%	1.6347E+20 ± 0.53%
-220.00	7.0050E+17 ± 6.41%	9.1991E+18 ± 1.96%	2.1663E+19 ± 1.24%	1.3539E+20 ± 0.58%	1.4856E+18 ± 3.42%	1.6844E+20 ± 0.52%

Table E-25. (Continued)

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
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-270.00	6.3089E+17 ±	6.60%	9.1136E+18 ±	1.99%	2.1754E+19 ±	1.22%	1.3376E+20 ±	0.58%	1.4543E+18 ±	3.44%	1.6671E+20 ±	0.52%
-320.00	5.9748E+17 ±	6.66%	8.6716E+18 ±	2.04%	2.1317E+19 ±	1.24%	1.3023E+20 ±	0.60%	1.4690E+18 ±	3.75%	1.6229E+20 ±	0.54%
-370.00	6.4066E+17 ±	6.55%	8.1628E+18 ±	2.02%	2.0394E+19 ±	1.27%	1.2201E+20 ±	0.61%	1.3901E+18 ±	3.63%	1.5260E+20 ±	0.54%
-420.00	5.7653E+17 ±	7.07%	7.8905E+18 ±	2.13%	1.8823E+19 ±	1.34%	1.1182E+20 ±	0.64%	1.3158E+18 ±	3.82%	1.4043E+20 ±	0.57%
-470.00	5.7811E+17 ±	6.44%	6.9647E+18 ±	2.27%	1.6102E+19 ±	1.41%	9.8162E+19 ±	0.68%	1.1167E+18 ±	4.16%	1.2292E+20 ±	0.61%
-520.00	6.1362E+17 ±	5.92%	5.7075E+18 ±	2.50%	1.2444E+19 ±	1.57%	7.8073E+19 ±	0.76%	9.5370E+17 ±	4.23%	9.7791E+19 ±	0.68%
-570.00	7.0134E+17 ±	5.48%	3.9904E+18 ±	2.85%	8.2043E+18 ±	1.93%	5.4468E+19 ±	0.90%	8.8553E+17 ±	4.32%	6.8250E+19 ±	0.80%
-620.00	7.9235E+17 ±	5.05%	3.0468E+18 ±	3.09%	5.4448E+18 ±	2.16%	3.5730E+19 ±	1.09%	7.9314E+17 ±	5.15%	4.5807E+19 ±	0.94%
-670.00	6.8981E+17 ±	5.16%	2.5128E+18 ±	3.05%	3.9087E+18 ±	2.44%	2.3916E+19 ±	1.28%	5.6590E+17 ±	5.57%	3.1593E+19 ±	1.09%
-720.00	6.8823E+17 ±	5.06%	2.0948E+18 ±	3.34%	3.0062E+18 ±	2.48%	1.6137E+19 ±	1.51%	4.2704E+17 ±	5.92%	2.2354E+19 ±	1.23%
-770.00	5.9919E+17 ±	5.46%	1.8379E+18 ±	3.49%	2.2582E+18 ±	2.69%	1.1401E+19 ±	1.75%	3.4502E+17 ±	7.11%	1.6442E+19 ±	1.39%
-820.00	5.6428E+17 ±	5.72%	1.6108E+18 ±	3.68%	1.9025E+18 ±	2.68%	8.2227E+18 ±	2.00%	2.3083E+17 ±	7.27%	1.2531E+19 ±	1.53%
-895.00	5.0753E+17 ±	4.68%	1.1824E+18 ±	3.22%	1.4231E+18 ±	2.43%	5.6911E+18 ±	1.84%	1.4827E+17 ±	7.26%	8.9524E+18 ±	1.40%
-995.00	3.2556E+17 ±	5.78%	8.1650E+17 ±	3.70%	9.4306E+17 ±	2.47%	3.5112E+18 ±	2.20%	9.4480E+16 ±	8.10%	5.6908E+18 ±	1.65%
-1095.00	2.2676E+17 ±	6.65%	5.6587E+17 ±	4.81%	6.5492E+17 ±	2.69%	2.1533E+18 ±	2.54%	6.1956E+16 ±	9.69%	3.6628E+18 ±	1.89%
-1195.00	1.5931E+17 ±	8.51%	4.1639E+17 ±	5.29%	4.6382E+17 ±	3.25%	1.4877E+18 ±	3.05%	4.3450E+16 ±	9.04%	2.5707E+18 ±	2.24%
-1295.00	1.3531E+17 ±	9.08%	2.6129E+17 ±	6.17%	3.1555E+17 ±	3.62%	1.0516E+18 ±	3.43%	3.4382E+16 ±	11.53%	1.7981E+18 ±	2.57%
-1395.00	1.0458E+17 ±	10.39%	2.1365E+17 ±	7.12%	2.2273E+17 ±	4.18%	7.8317E+17 ±	4.07%	2.7900E+16 ±	11.57%	1.3520E+18 ±	3.00%
-1495.00	7.9860E+16 ±	12.22%	1.6044E+17 ±	8.33%	1.7793E+17 ±	4.58%	5.0575E+17 ±	4.72%	1.5038E+16 ±	16.18%	9.3902E+17 ±	3.41%
-1595.00	4.4946E+16 ±	15.67%	1.3719E+17 ±	9.25%	1.3711E+17 ±	5.07%	3.8657E+17 ±	5.81%	6.9744E+15 ±	15.42%	7.1279E+17 ±	4.18%
-1695.00	3.5958E+16 ±	16.54%	1.0215E+17 ±	10.15%	9.7228E+16 ±	6.52%	2.4717E+17 ±	6.47%	6.1455E+15 ±	25.31%	4.8866E+17 ±	4.53%
-1820.00	2.2999E+16 ±	19.45%	6.3862E+16 ±	11.55%	6.0832E+16 ±	8.21%	1.9079E+17 ±	6.69%	4.5030E+15 ±	22.00%	3.4298E+17 ±	5.17%
-1968.60	1.1986E+16 ±	26.28%	3.4953E+16 ±	17.23%	3.2165E+16 ±	9.85%	1.2653E+17 ±	8.57%	b		2.0847E+17 ±	6.76%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-26. Five-group Photon Spectrum (m^2s^{-1}) in the Central Control Rod 3 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1295.00	b	$9.0801\text{E}+16 \pm 16.22\%$	$1.3076\text{E}+17 \pm 12.20\%$	$1.7049\text{E}+17 \pm 9.71\%$	b	$3.9801\text{E}+17 \pm 7.79\%$
1195.00	b	$1.4084\text{E}+17 \pm 11.31\%$	$2.0409\text{E}+17 \pm 10.53\%$	$2.9105\text{E}+17 \pm 9.17\%$	$4.9416\text{E}+14 \pm 24.59\%$	$6.4707\text{E}+17 \pm 6.36\%$
1095.00	$1.4573\text{E}+16 \pm 29.76\%$	$2.6881\text{E}+17 \pm 9.56\%$	$3.4188\text{E}+17 \pm 8.05\%$	$4.6618\text{E}+17 \pm 5.88\%$	$5.5952\text{E}+14 \pm 16.55\%$	$1.0920\text{E}+18 \pm 4.67\%$
995.00	$3.2378\text{E}+16 \pm 18.82\%$	$5.2720\text{E}+17 \pm 6.48\%$	$8.5339\text{E}+17 \pm 5.25\%$	$8.2532\text{E}+17 \pm 4.32\%$	$1.8585\text{E}+15 \pm 12.10\%$	$2.2401\text{E}+18 \pm 3.32\%$
895.00	$5.8014\text{E}+16 \pm 15.36\%$	$1.3152\text{E}+18 \pm 4.39\%$	$1.5917\text{E}+18 \pm 3.93\%$	$1.7074\text{E}+18 \pm 3.26\%$	$2.5620\text{E}+15 \pm 10.32\%$	$4.6748\text{E}+18 \pm 2.44\%$
820.00	$7.6256\text{E}+16 \pm 17.78\%$	$1.9854\text{E}+18 \pm 4.75\%$	$2.4506\text{E}+18 \pm 4.04\%$	$2.7339\text{E}+18 \pm 3.73\%$	$3.3445\text{E}+15 \pm 10.04\%$	$7.2495\text{E}+18 \pm 2.62\%$
770.00	$1.1712\text{E}+17 \pm 14.84\%$	$2.9481\text{E}+18 \pm 3.97\%$	$3.5421\text{E}+18 \pm 3.59\%$	$3.7928\text{E}+18 \pm 3.13\%$	$5.7225\text{E}+15 \pm 10.03\%$	$1.0406\text{E}+19 \pm 2.20\%$
720.00	$1.4596\text{E}+17 \pm 15.03\%$	$3.8572\text{E}+18 \pm 3.53\%$	$4.8020\text{E}+18 \pm 3.04\%$	$4.9747\text{E}+18 \pm 2.56\%$	$6.3886\text{E}+15 \pm 8.30\%$	$1.3786\text{E}+19 \pm 1.91\%$
670.00	$1.8656\text{E}+17 \pm 14.96\%$	$4.9789\text{E}+18 \pm 3.11\%$	$6.5525\text{E}+18 \pm 2.69\%$	$6.6928\text{E}+18 \pm 2.20\%$	$9.1116\text{E}+15 \pm 10.01\%$	$1.8420\text{E}+19 \pm 1.67\%$
620.00	$2.3185\text{E}+17 \pm 12.09\%$	$6.2042\text{E}+18 \pm 2.68\%$	$8.0407\text{E}+18 \pm 2.36\%$	$8.7280\text{E}+18 \pm 1.86\%$	$1.0580\text{E}+16 \pm 6.89\%$	$2.3215\text{E}+19 \pm 1.44\%$
570.00	$2.2825\text{E}+17 \pm 11.32\%$	$7.2505\text{E}+18 \pm 2.51\%$	$9.9670\text{E}+18 \pm 2.06\%$	$1.1844\text{E}+19 \pm 1.63\%$	$1.3800\text{E}+16 \pm 6.63\%$	$2.9303\text{E}+19 \pm 1.27\%$
520.00	$2.6998\text{E}+17 \pm 9.74\%$	$8.0478\text{E}+18 \pm 2.26\%$	$1.1556\text{E}+19 \pm 1.87\%$	$1.4609\text{E}+19 \pm 1.43\%$	$1.6429\text{E}+16 \pm 4.80\%$	$3.4499\text{E}+19 \pm 1.13\%$
470.00	$3.9252\text{E}+17 \pm 9.55\%$	$9.0078\text{E}+18 \pm 2.10\%$	$1.3158\text{E}+19 \pm 1.72\%$	$1.7337\text{E}+19 \pm 1.29\%$	$1.9199\text{E}+16 \pm 5.02\%$	$3.9915\text{E}+19 \pm 1.03\%$
420.00	$4.0597\text{E}+17 \pm 8.49\%$	$1.0533\text{E}+19 \pm 1.91\%$	$1.5282\text{E}+19 \pm 1.54\%$	$2.0590\text{E}+19 \pm 1.16\%$	$2.2003\text{E}+16 \pm 4.70\%$	$4.6833\text{E}+19 \pm 0.93\%$
370.00	$4.2021\text{E}+17 \pm 7.78\%$	$1.1985\text{E}+19 \pm 1.78\%$	$1.7527\text{E}+19 \pm 1.48\%$	$2.3017\text{E}+19 \pm 1.10\%$	$2.6499\text{E}+16 \pm 4.34\%$	$5.2976\text{E}+19 \pm 0.88\%$
320.00	$4.1681\text{E}+17 \pm 8.56\%$	$1.3474\text{E}+19 \pm 1.71\%$	$1.9081\text{E}+19 \pm 1.40\%$	$2.5554\text{E}+19 \pm 1.04\%$	$2.9083\text{E}+16 \pm 4.58\%$	$5.8555\text{E}+19 \pm 0.84\%$
270.00	$4.8634\text{E}+17 \pm 7.59\%$	$1.4490\text{E}+19 \pm 1.65\%$	$2.0809\text{E}+19 \pm 1.34\%$	$2.7813\text{E}+19 \pm 1.01\%$	$2.9422\text{E}+16 \pm 4.00\%$	$6.3628\text{E}+19 \pm 0.81\%$
220.00	$6.1769\text{E}+17 \pm 6.76\%$	$1.5550\text{E}+19 \pm 1.59\%$	$2.2690\text{E}+19 \pm 1.31\%$	$2.9634\text{E}+19 \pm 0.99\%$	$3.1975\text{E}+16 \pm 3.73\%$	$6.8524\text{E}+19 \pm 0.79\%$
170.00	$6.7054\text{E}+17 \pm 6.76\%$	$1.8613\text{E}+19 \pm 1.46\%$	$2.6554\text{E}+19 \pm 1.25\%$	$3.3940\text{E}+19 \pm 0.92\%$	$4.0796\text{E}+16 \pm 3.61\%$	$7.9818\text{E}+19 \pm 0.74\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-27. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Central Control Rod 3 Al-6061 Support Tube. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
2188.45	b	b	6.2610E+15 ± 22.39%	3.0481E+16 ± 16.46%	b	4.6796E+16 ± 13.33%
1995.00	b	b	8.3315E+15 ± 14.96%	4.7416E+16 ± 14.96%	b	7.2471E+16 ± 13.42%
1820.00	b	b	1.9216E+16 ± 21.53%	8.3682E+16 ± 13.83%	b	1.2529E+17 ± 12.46%
1695.00	b	b	2.4808E+16 ± 21.60%	1.1276E+17 ± 13.58%	b	1.6092E+17 ± 11.49%
1595.00	b	2.0485E+16 ± 29.91%	4.3458E+16 ± 23.88%	1.3747E+17 ± 13.95%	b	2.0905E+17 ± 11.23%
1495.00	b	b	4.1339E+16 ± 25.44%	2.0156E+17 ± 10.26%	b	2.8520E+17 ± 9.52%
1395.00	b	4.9004E+16 ± 22.21%	4.6322E+16 ± 18.68%	2.8223E+17 ± 10.21%	9.5342E+15 ± 24.21%	3.9051E+17 ± 8.79%
1295.00	b	9.6186E+16 ± 20.33%	1.0103E+17 ± 17.24%	2.0447E+17 ± 15.01%	b	4.1002E+17 ± 10.90%
1195.00	b	1.4993E+17 ± 18.08%	1.7509E+17 ± 12.28%	3.5674E+17 ± 11.30%	b	7.0028E+17 ± 8.03%
1095.00	b	2.1742E+17 ± 14.14%	3.5531E+17 ± 9.67%	5.5648E+17 ± 9.86%	b	1.1465E+18 ± 6.68%
995.00	3.8868E+16 ± 21.25%	4.1469E+17 ± 9.09%	7.3504E+17 ± 7.26%	1.0054E+18 ± 6.50%	b	2.1949E+18 ± 4.48%
895.00	6.5823E+16 ± 18.84%	1.0809E+18 ± 6.37%	1.3299E+18 ± 4.96%	2.0007E+18 ± 4.70%	b	4.4796E+18 ± 3.16%
820.00	9.6340E+16 ± 21.10%	1.6906E+18 ± 6.41%	1.9357E+18 ± 5.61%	3.2795E+18 ± 4.84%	b	7.0110E+18 ± 3.30%
770.00	9.8426E+16 ± 23.79%	2.2792E+18 ± 5.41%	2.6113E+18 ± 5.08%	4.3790E+18 ± 4.05%	b	9.3808E+18 ± 2.83%
720.00	1.5475E+17 ± 18.21%	2.9843E+18 ± 4.72%	3.6011E+18 ± 4.08%	5.8941E+18 ± 3.78%	b	1.2649E+19 ± 2.51%
670.00	2.4405E+17 ± 20.41%	3.8882E+18 ± 4.39%	4.9636E+18 ± 3.57%	7.8817E+18 ± 3.14%	3.3551E+16 ± 24.00%	1.7011E+19 ± 2.18%
620.00	2.4928E+17 ± 16.85%	4.6734E+18 ± 3.67%	6.6757E+18 ± 3.02%	1.0318E+19 ± 2.65%	4.4050E+16 ± 21.88%	2.1960E+19 ± 1.82%
570.00	2.4461E+17 ± 13.23%	5.5739E+18 ± 3.33%	7.8283E+18 ± 2.67%	1.4077E+19 ± 2.33%	5.8630E+16 ± 19.46%	2.7782E+19 ± 1.63%
520.00	3.3041E+17 ± 13.34%	6.6469E+18 ± 3.03%	9.6133E+18 ± 2.44%	1.6960E+19 ± 2.03%	7.6817E+16 ± 18.24%	3.3627E+19 ± 1.47%
470.00	3.7782E+17 ± 11.38%	7.3957E+18 ± 2.72%	1.0766E+19 ± 2.22%	2.0350E+19 ± 1.80%	6.7419E+16 ± 15.16%	3.8957E+19 ± 1.30%
420.00	3.5687E+17 ± 10.51%	8.4955E+18 ± 2.52%	1.3259E+19 ± 2.04%	2.3787E+19 ± 1.74%	9.0504E+16 ± 16.32%	4.5988E+19 ± 1.23%
370.00	4.0991E+17 ± 10.58%	1.0058E+19 ± 2.40%	1.4693E+19 ± 1.89%	2.7871E+19 ± 1.59%	1.5450E+17 ± 13.70%	5.3187E+19 ± 1.14%
320.00	4.1488E+17 ± 9.97%	1.0618E+19 ± 2.28%	1.6211E+19 ± 1.80%	3.0142E+19 ± 1.48%	1.5598E+17 ± 14.82%	5.7542E+19 ± 1.08%
270.00	5.0044E+17 ± 9.87%	1.2077E+19 ± 2.16%	1.7803E+19 ± 1.72%	3.2168E+19 ± 1.45%	1.4497E+17 ± 15.19%	6.2694E+19 ± 1.05%
220.00	6.2634E+17 ± 8.60%	1.2713E+19 ± 2.12%	1.9186E+19 ± 1.67%	3.5890E+19 ± 1.39%	2.0759E+17 ± 13.42%	6.8624E+19 ± 1.00%
170.00	6.8682E+17 ± 8.56%	1.3614E+19 ± 2.05%	2.0575E+19 ± 1.65%	4.4305E+19 ± 1.22%	4.0483E+17 ± 9.64%	7.9585E+19 ± 0.92%
125.00	7.1379E+17 ± 6.46%	8.5691E+18 ± 2.22%	1.4826E+19 ± 1.67%	7.4485E+19 ± 0.84%	9.7112E+17 ± 4.72%	9.9565E+19 ± 0.73%
95.00	7.6229E+17 ± 7.00%	6.7400E+18 ± 2.95%	1.1967E+19 ± 2.15%	8.1718E+19 ± 0.97%	1.3067E+18 ± 5.80%	1.0249E+20 ± 0.86%
75.00	7.9006E+17 ± 6.96%	6.4136E+18 ± 3.20%	1.1921E+19 ± 2.14%	8.4569E+19 ± 0.95%	1.3245E+18 ± 5.55%	1.0502E+20 ± 0.85%
55.00	7.9508E+17 ± 7.64%	5.7482E+18 ± 3.16%	1.1684E+19 ± 2.20%	8.7025E+19 ± 0.93%	1.2939E+18 ± 5.18%	1.0655E+20 ± 0.84%
35.00	6.9582E+17 ± 7.66%	5.7484E+18 ± 3.18%	1.1612E+19 ± 2.16%	8.9067E+19 ± 0.92%	1.4669E+18 ± 4.75%	1.0859E+20 ± 0.83%
20.00	7.2305E+17 ± 8.72%	5.7593E+18 ± 3.67%	1.1958E+19 ± 2.47%	9.0429E+19 ± 1.06%	1.5981E+18 ± 6.08%	1.1047E+20 ± 0.95%
7.50	8.1801E+17 ± 7.92%	5.9609E+18 ± 3.31%	1.2691E+19 ± 2.24%	9.5357E+19 ± 0.95%	1.5145E+18 ± 5.35%	1.1634E+20 ± 0.85%
-7.50	7.8924E+17 ± 8.15%	6.3968E+18 ± 3.27%	1.3490E+19 ± 2.17%	1.0039E+20 ± 0.94%	1.5174E+18 ± 5.20%	1.2258E+20 ± 0.85%
-20.00	7.4988E+17 ± 7.88%	6.6807E+18 ± 3.53%	1.4198E+19 ± 2.32%	1.0338E+20 ± 1.01%	1.5424E+18 ± 7.39%	1.2655E+20 ± 0.90%
-35.00	7.9940E+17 ± 7.45%	6.5777E+18 ± 2.99%	1.4955E+19 ± 1.98%	1.0634E+20 ± 0.85%	1.7803E+18 ± 5.34%	1.3046E+20 ± 0.76%
-55.00	7.6145E+17 ± 7.28%	7.1360E+18 ± 3.01%	1.6436E+19 ± 1.92%	1.1314E+20 ± 0.83%	1.5551E+18 ± 5.19%	1.3903E+20 ± 0.75%
-75.00	7.1718E+17 ± 7.36%	7.1990E+18 ± 2.82%	1.6856E+19 ± 1.85%	1.1744E+20 ± 0.82%	1.4259E+18 ± 4.93%	1.4363E+20 ± 0.74%
-95.00	6.6986E+17 ± 7.28%	7.2346E+18 ± 2.88%	1.7612E+19 ± 1.80%	1.2071E+20 ± 0.80%	1.6099E+18 ± 5.25%	1.4784E+20 ± 0.73%
-125.00	6.7856E+17 ± 6.24%	8.1197E+18 ± 2.28%	1.8836E+19 ± 1.43%	1.2497E+20 ± 0.65%	1.5670E+18 ± 3.84%	1.5417E+20 ± 0.58%
-170.00	7.6010E+17 ± 6.02%	8.7957E+18 ± 2.03%	2.0820E+19 ± 1.26%	1.3163E+20 ± 0.59%	1.5422E+18 ± 3.47%	1.6355E+20 ± 0.53%
-220.00	7.0825E+17 ± 5.95%	9.2136E+18 ± 1.96%	2.1601E+19 ± 1.23%	1.3526E+20 ± 0.58%	1.5420E+18 ± 3.28%	1.6832E+20 ± 0.52%

Table E-27. (Continued)

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
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-270.00	6.5655E+17 ±	6.02%	8.8156E+18 ±	1.96%	2.1708E+19 ±	1.23%	1.3358E+20 ±	0.58%	1.5105E+18 ±	3.49%	1.6627E+20 ±	0.52%
-320.00	5.3816E+17 ±	6.44%	8.5195E+18 ±	2.01%	2.1067E+19 ±	1.26%	1.3055E+20 ±	0.60%	1.4025E+18 ±	3.58%	1.6208E+20 ±	0.53%
-370.00	5.1141E+17 ±	6.83%	8.4527E+18 ±	2.08%	2.0487E+19 ±	1.28%	1.2170E+20 ±	0.61%	1.3070E+18 ±	3.52%	1.5246E+20 ±	0.54%
-420.00	5.7931E+17 ±	6.51%	7.8440E+18 ±	2.12%	1.8481E+19 ±	1.31%	1.1046E+20 ±	0.64%	1.2259E+18 ±	3.86%	1.3859E+20 ±	0.57%
-470.00	6.0792E+17 ±	6.24%	6.7204E+18 ±	2.27%	1.6174E+19 ±	1.39%	9.7231E+19 ±	0.69%	1.1333E+18 ±	3.89%	1.2187E+20 ±	0.61%
-520.00	6.3255E+17 ±	5.81%	5.5587E+18 ±	2.55%	1.2525E+19 ±	1.59%	7.6852E+19 ±	0.76%	9.9899E+17 ±	4.37%	9.6567E+19 ±	0.67%
-570.00	6.9658E+17 ±	5.74%	4.1009E+18 ±	2.76%	7.6576E+18 ±	1.85%	5.3977E+19 ±	0.89%	9.3489E+17 ±	4.89%	6.7367E+19 ±	0.79%
-620.00	7.3602E+17 ±	5.09%	2.9805E+18 ±	2.92%	5.3722E+18 ±	2.19%	3.5942E+19 ±	1.10%	7.4743E+17 ±	4.91%	4.5778E+19 ±	0.95%
-670.00	7.2522E+17 ±	5.17%	2.4814E+18 ±	3.12%	3.9331E+18 ±	2.39%	2.3845E+19 ±	1.30%	6.1734E+17 ±	5.40%	3.1602E+19 ±	1.10%
-720.00	7.1138E+17 ±	5.20%	2.1137E+18 ±	3.42%	2.9436E+18 ±	2.31%	1.6150E+19 ±	1.50%	4.1242E+17 ±	5.69%	2.2331E+19 ±	1.23%
-770.00	6.9226E+17 ±	5.22%	1.8363E+18 ±	3.58%	2.3984E+18 ±	2.70%	1.1626E+19 ±	1.75%	2.8840E+17 ±	6.62%	1.6842E+19 ±	1.39%
-820.00	5.4522E+17 ±	5.72%	1.5469E+18 ±	3.77%	1.9113E+18 ±	2.85%	8.7100E+18 ±	2.00%	2.2305E+17 ±	7.34%	1.2936E+19 ±	1.56%
-895.00	4.7677E+17 ±	4.79%	1.1965E+18 ±	3.22%	1.3793E+18 ±	2.16%	5.4880E+18 ±	1.81%	1.6296E+17 ±	6.92%	8.7035E+18 ±	1.37%
-995.00	3.4117E+17 ±	5.88%	8.5359E+17 ±	4.31%	9.6352E+17 ±	2.72%	3.2741E+18 ±	2.14%	8.2149E+16 ±	6.68%	5.5145E+18 ±	1.62%
-1095.00	2.5194E+17 ±	6.70%	6.1363E+17 ±	4.47%	6.0954E+17 ±	2.69%	2.2016E+18 ±	2.60%	6.4750E+16 ±	9.71%	3.7415E+18 ±	1.91%
-1195.00	1.7483E+17 ±	8.15%	4.3582E+17 ±	5.30%	4.6302E+17 ±	2.84%	1.5223E+18 ±	3.08%	3.7778E+16 ±	10.63%	2.6337E+18 ±	2.25%
-1295.00	1.2698E+17 ±	8.96%	2.8639E+17 ±	6.23%	3.1866E+17 ±	3.61%	1.0844E+18 ±	3.67%	2.9615E+16 ±	11.43%	1.8460E+18 ±	2.67%
-1395.00	9.4365E+16 ±	11.20%	2.1622E+17 ±	7.74%	2.3133E+17 ±	4.05%	7.4310E+17 ±	4.26%	1.9700E+16 ±	12.99%	1.3047E+18 ±	3.12%
-1495.00	6.2757E+16 ±	13.44%	1.4243E+17 ±	8.76%	1.7490E+17 ±	4.82%	5.3425E+17 ±	4.70%	1.0449E+16 ±	13.36%	9.2479E+17 ±	3.52%
-1595.00	4.2558E+16 ±	17.67%	1.2287E+17 ±	9.66%	1.2674E+17 ±	5.57%	3.6710E+17 ±	4.95%	8.8987E+15 ±	17.76%	6.6816E+17 ±	3.84%
-1695.00	3.8178E+16 ±	16.46%	9.5468E+16 ±	11.65%	1.0857E+17 ±	6.96%	2.9034E+17 ±	6.41%	9.8983E+15 ±	21.29%	5.4246E+17 ±	4.67%
-1820.00	2.5998E+16 ±	18.73%	5.4038E+16 ±	13.65%	6.2081E+16 ±	8.31%	2.1493E+17 ±	6.69%	5.2847E+15 ±	26.47%	3.6234E+17 ±	5.18%
-1968.60	1.7341E+16 ±	26.22%	2.8130E+16 ±	17.94%	3.4613E+16 ±	10.29%	1.0833E+17 ±	7.73%	1.6737E+15 ±	29.46%	1.9009E+17 ±	6.50%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-28. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Irradiation Target 1 (Instrumented) Target. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
513.50	4.2859E+17 $\pm$ 11.48%	4.2226E+18 $\pm$ 4.08%	7.5578E+18 $\pm$ 2.87%	3.6045E+19 $\pm$ 1.51%	8.6495E+16 $\pm$ 9.04%	4.8340E+19 $\pm$ 1.31%
470.00	5.0885E+17 $\pm$ 8.41%	4.7041E+18 $\pm$ 3.44%	9.4344E+18 $\pm$ 2.30%	4.3592E+19 $\pm$ 1.22%	6.4009E+16 $\pm$ 10.08%	5.8303E+19 $\pm$ 1.06%
420.00	4.9592E+17 $\pm$ 8.75%	5.6561E+18 $\pm$ 3.21%	1.1077E+19 $\pm$ 2.17%	5.1015E+19 $\pm$ 1.13%	7.3736E+16 $\pm$ 10.26%	6.8317E+19 $\pm$ 1.00%
370.00	5.5337E+17 $\pm$ 8.46%	6.4305E+18 $\pm$ 2.92%	1.2490E+19 $\pm$ 2.04%	5.8041E+19 $\pm$ 1.05%	7.5902E+16 $\pm$ 9.72%	7.7591E+19 $\pm$ 0.92%
320.00	5.4980E+17 $\pm$ 7.92%	6.7194E+18 $\pm$ 2.92%	1.3540E+19 $\pm$ 1.95%	6.3513E+19 $\pm$ 1.02%	8.2285E+16 $\pm$ 8.26%	8.4404E+19 $\pm$ 0.90%
270.00	6.0739E+17 $\pm$ 7.88%	7.2569E+18 $\pm$ 2.77%	1.4859E+19 $\pm$ 1.87%	6.7138E+19 $\pm$ 0.99%	8.1492E+16 $\pm$ 8.11%	8.9944E+19 $\pm$ 0.86%
220.00	6.8368E+17 $\pm$ 6.71%	7.6197E+18 $\pm$ 2.69%	1.5440E+19 $\pm$ 1.85%	7.2510E+19 $\pm$ 0.97%	9.4175E+16 $\pm$ 7.30%	9.6347E+19 $\pm$ 0.85%
170.00	8.1762E+17 $\pm$ 6.32%	8.1135E+18 $\pm$ 2.69%	1.5956E+19 $\pm$ 1.82%	7.5831E+19 $\pm$ 0.93%	1.0809E+17 $\pm$ 7.52%	1.0083E+20 $\pm$ 0.81%
125.00	1.1247E+18 $\pm$ 5.78%	7.5178E+18 $\pm$ 2.89%	1.5656E+19 $\pm$ 2.00%	7.9736E+19 $\pm$ 1.00%	1.2798E+17 $\pm$ 8.62%	1.0416E+20 $\pm$ 0.87%
95.00	1.1486E+18 $\pm$ 7.04%	7.1614E+18 $\pm$ 3.68%	1.5188E+19 $\pm$ 2.49%	8.2023E+19 $\pm$ 1.21%	1.3705E+17 $\pm$ 10.33%	1.0566E+20 $\pm$ 1.06%
75.00	1.1478E+18 $\pm$ 7.03%	7.0946E+18 $\pm$ 3.77%	1.4460E+19 $\pm$ 2.51%	8.0839E+19 $\pm$ 1.22%	1.5723E+17 $\pm$ 13.43%	1.0370E+20 $\pm$ 1.08%
55.00	1.1968E+18 $\pm$ 6.78%	6.9928E+18 $\pm$ 3.74%	1.4611E+19 $\pm$ 2.53%	8.0599E+19 $\pm$ 1.19%	1.3026E+17 $\pm$ 9.71%	1.0353E+20 $\pm$ 1.05%
35.00	1.2043E+18 $\pm$ 7.06%	6.6459E+18 $\pm$ 3.89%	1.4332E+19 $\pm$ 2.49%	8.4067E+19 $\pm$ 1.16%	2.6230E+17 $\pm$ 9.34%	1.0651E+20 $\pm$ 1.03%

Table E-29. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Irradiation Target 1 (Instrumented) Bracket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
513.50	4.0034E+17 $\pm$ 15.53%	4.6052E+18 $\pm$ 5.19%	7.9321E+18 $\pm$ 3.98%	3.5431E+19 $\pm$ 2.04%	4.9655E+17 $\pm$ 16.70%	4.8865E+19 $\pm$ 1.72%
470.00	3.7851E+17 $\pm$ 12.90%	5.0282E+18 $\pm$ 4.66%	9.2765E+18 $\pm$ 3.15%	4.2968E+19 $\pm$ 1.59%	3.6812E+17 $\pm$ 13.22%	5.8019E+19 $\pm$ 1.37%
420.00	3.7720E+17 $\pm$ 11.54%	5.8137E+18 $\pm$ 4.31%	1.0771E+19 $\pm$ 2.82%	5.1999E+19 $\pm$ 1.51%	4.1862E+17 $\pm$ 13.70%	6.9379E+19 $\pm$ 1.30%
370.00	4.9562E+17 $\pm$ 10.42%	7.0951E+18 $\pm$ 3.87%	1.2533E+19 $\pm$ 2.75%	5.8017E+19 $\pm$ 1.41%	5.2674E+17 $\pm$ 15.52%	7.8668E+19 $\pm$ 1.21%
320.00	5.1224E+17 $\pm$ 10.37%	7.2870E+18 $\pm$ 3.64%	1.3492E+19 $\pm$ 2.64%	6.3496E+19 $\pm$ 1.31%	4.0250E+17 $\pm$ 11.27%	8.5189E+19 $\pm$ 1.13%
270.00	4.6016E+17 $\pm$ 10.39%	7.5642E+18 $\pm$ 3.47%	1.4940E+19 $\pm$ 2.45%	6.7288E+19 $\pm$ 1.27%	4.6951E+17 $\pm$ 12.94%	9.0722E+19 $\pm$ 1.09%
220.00	6.4423E+17 $\pm$ 8.77%	8.1448E+18 $\pm$ 3.53%	1.5445E+19 $\pm$ 2.56%	7.1928E+19 $\pm$ 1.24%	6.0583E+17 $\pm$ 11.46%	9.6769E+19 $\pm$ 1.07%
170.00	7.6109E+17 $\pm$ 8.18%	8.3104E+18 $\pm$ 3.39%	1.6239E+19 $\pm$ 2.43%	7.7711E+19 $\pm$ 1.21%	7.3032E+17 $\pm$ 9.40%	1.0375E+20 $\pm$ 1.05%
125.00	9.6923E+17 $\pm$ 8.87%	7.9323E+18 $\pm$ 3.97%	1.5065E+19 $\pm$ 2.70%	8.3574E+19 $\pm$ 1.31%	7.2011E+17 $\pm$ 9.40%	1.0826E+20 $\pm$ 1.14%
95.00	8.6451E+17 $\pm$ 10.75%	7.1941E+18 $\pm$ 5.88%	1.3750E+19 $\pm$ 3.68%	8.6472E+19 $\pm$ 1.65%	7.3329E+17 $\pm$ 10.67%	1.0901E+20 $\pm$ 1.46%
75.00	8.3721E+17 $\pm$ 10.57%	7.3153E+18 $\pm$ 5.88%	1.3865E+19 $\pm$ 3.88%	8.8306E+19 $\pm$ 1.68%	8.0169E+17 $\pm$ 14.15%	1.1113E+20 $\pm$ 1.49%
55.00	1.0829E+18 $\pm$ 10.07%	6.9062E+18 $\pm$ 5.28%	1.4091E+19 $\pm$ 3.78%	9.0671E+19 $\pm$ 1.67%	6.4905E+17 $\pm$ 11.09%	1.1340E+20 $\pm$ 1.47%
35.00	1.0107E+18 $\pm$ 9.92%	6.5395E+18 $\pm$ 5.71%	1.4700E+19 $\pm$ 4.00%	9.3427E+19 $\pm$ 1.62%	1.1151E+18 $\pm$ 11.97%	1.1679E+20 $\pm$ 1.44%

Table E-30. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Irradiation Target 2 (Uninstrumented) Target. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
513.50	4.9375E+17 $\pm$ 20.35%	4.3970E+18 $\pm$ 8.53%	8.4952E+18 $\pm$ 6.18%	3.9728E+19 $\pm$ 2.84%	2.6742E+17 $\pm$ 24.61%	5.3381E+19 $\pm$ 2.48%
470.00	3.8623E+17 $\pm$ 24.66%	4.9143E+18 $\pm$ 6.89%	9.9636E+18 $\pm$ 4.63%	4.9131E+19 $\pm$ 2.33%	2.0005E+17 $\pm$ 25.34%	6.4595E+19 $\pm$ 2.01%
420.00	4.0370E+17 $\pm$ 24.06%	5.7247E+18 $\pm$ 6.13%	1.1839E+19 $\pm$ 4.28%	5.8135E+19 $\pm$ 2.11%	2.7402E+17 $\pm$ 23.91%	7.6376E+19 $\pm$ 1.83%
370.00	4.2245E+17 $\pm$ 18.69%	6.5193E+18 $\pm$ 5.91%	1.4126E+19 $\pm$ 3.82%	6.4949E+19 $\pm$ 2.04%	2.8683E+17 $\pm$ 14.08%	8.6304E+19 $\pm$ 1.74%
320.00	6.4496E+17 $\pm$ 16.80%	7.8132E+18 $\pm$ 5.51%	1.4975E+19 $\pm$ 3.71%	7.2735E+19 $\pm$ 1.88%	2.9804E+17 $\pm$ 18.19%	9.6466E+19 $\pm$ 1.62%
270.00	5.1158E+17 $\pm$ 16.50%	7.5931E+18 $\pm$ 5.50%	1.6275E+19 $\pm$ 3.61%	7.8364E+19 $\pm$ 1.87%	2.2636E+17 $\pm$ 14.05%	1.0297E+20 $\pm$ 1.61%
220.00	5.4501E+17 $\pm$ 15.61%	7.7383E+18 $\pm$ 5.17%	1.6655E+19 $\pm$ 3.50%	7.9938E+19 $\pm$ 1.77%	2.4402E+17 $\pm$ 13.89%	1.0512E+20 $\pm$ 1.53%
170.00	8.8536E+17 $\pm$ 12.82%	7.6745E+18 $\pm$ 5.48%	1.6792E+19 $\pm$ 3.56%	8.7248E+19 $\pm$ 1.68%	2.8807E+17 $\pm$ 13.31%	1.1289E+20 $\pm$ 1.48%
125.00	7.5024E+17 $\pm$ 14.81%	7.2869E+18 $\pm$ 5.83%	1.6014E+19 $\pm$ 3.91%	8.6142E+19 $\pm$ 1.83%	3.3528E+17 $\pm$ 14.43%	1.1053E+20 $\pm$ 1.61%
95.00	9.6035E+17 $\pm$ 16.26%	7.1970E+18 $\pm$ 7.82%	1.6977E+19 $\pm$ 5.47%	9.1919E+19 $\pm$ 2.39%	4.5318E+17 $\pm$ 21.03%	1.1751E+20 $\pm$ 2.12%
75.00	8.7438E+17 $\pm$ 18.18%	7.4281E+18 $\pm$ 7.79%	1.6101E+19 $\pm$ 5.19%	9.0671E+19 $\pm$ 2.33%	3.7936E+17 $\pm$ 17.13%	1.1545E+20 $\pm$ 2.06%
55.00	8.1781E+17 $\pm$ 24.69%	7.4457E+18 $\pm$ 8.24%	1.4618E+19 $\pm$ 5.39%	8.6533E+19 $\pm$ 2.39%	7.4402E+17 $\pm$ 17.70%	1.1016E+20 $\pm$ 2.12%
35.00	5.6222E+17 $\pm$ 19.64%	7.8835E+18 $\pm$ 7.57%	1.4421E+19 $\pm$ 5.71%	9.2649E+19 $\pm$ 2.35%	4.9708E+17 $\pm$ 15.86%	1.1601E+20 $\pm$ 2.10%

Table E-31. Five-group Photon Spectrum (m^2s^{-1}) in the Upper Irradiation Target 2 (Uninstrumented) Bracket. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
513.50	3.8568E+17 $\pm$ 23.17%	4.2846E+18 $\pm$ 8.18%	7.7150E+18 $\pm$ 5.76%	3.8168E+19 $\pm$ 2.84%	6.2149E+17 $\pm$ 17.49%	5.1175E+19 $\pm$ 2.43%
470.00	3.5224E+17 $\pm$ 20.76%	5.1290E+18 $\pm$ 6.98%	9.7571E+18 $\pm$ 4.50%	4.8907E+19 $\pm$ 2.35%	4.3955E+17 $\pm$ 17.62%	6.4585E+19 $\pm$ 2.01%
420.00	3.9279E+17 $\pm$ 23.74%	5.3412E+18 $\pm$ 5.95%	1.2416E+19 $\pm$ 4.36%	5.9672E+19 $\pm$ 2.34%	4.9254E+17 $\pm$ 20.81%	7.8314E+19 $\pm$ 1.98%
370.00	3.9501E+17 $\pm$ 18.79%	6.3921E+18 $\pm$ 5.81%	1.2678E+19 $\pm$ 3.90%	6.3958E+19 $\pm$ 2.15%	6.9336E+17 $\pm$ 13.41%	8.4117E+19 $\pm$ 1.81%
320.00	4.7005E+17 $\pm$ 15.69%	6.6777E+18 $\pm$ 5.63%	1.4789E+19 $\pm$ 4.05%	7.1653E+19 $\pm$ 1.92%	6.1309E+17 $\pm$ 13.46%	9.4203E+19 $\pm$ 1.67%
270.00	5.1578E+17 $\pm$ 17.99%	8.2026E+18 $\pm$ 6.01%	1.6503E+19 $\pm$ 3.79%	8.2333E+19 $\pm$ 2.06%	5.8860E+17 $\pm$ 14.36%	1.0814E+20 $\pm$ 1.76%
220.00	4.8278E+17 $\pm$ 17.72%	7.4447E+18 $\pm$ 5.24%	1.5647E+19 $\pm$ 3.69%	8.0438E+19 $\pm$ 1.82%	6.1639E+17 $\pm$ 14.90%	1.0463E+20 $\pm$ 1.57%
170.00	7.2433E+17 $\pm$ 13.56%	7.3353E+18 $\pm$ 5.55%	1.6200E+19 $\pm$ 3.77%	9.0082E+19 $\pm$ 1.79%	9.2206E+17 $\pm$ 12.97%	1.1526E+20 $\pm$ 1.56%
125.00	5.6766E+17 $\pm$ 15.05%	7.1914E+18 $\pm$ 6.39%	1.6197E+19 $\pm$ 4.28%	8.9194E+19 $\pm$ 1.93%	8.1880E+17 $\pm$ 10.58%	1.1397E+20 $\pm$ 1.70%
95.00	9.4357E+17 $\pm$ 19.13%	6.9146E+18 $\pm$ 9.02%	1.5319E+19 $\pm$ 6.03%	9.1661E+19 $\pm$ 2.45%	1.0316E+18 $\pm$ 13.68%	1.1587E+20 $\pm$ 2.18%
75.00	7.0460E+17 $\pm$ 22.10%	7.0713E+18 $\pm$ 8.29%	1.5315E+19 $\pm$ 5.90%	9.5291E+19 $\pm$ 2.46%	1.8402E+18 $\pm$ 22.24%	1.2022E+20 $\pm$ 2.19%
55.00	8.7748E+17 $\pm$ 25.40%	7.4217E+18 $\pm$ 9.31%	1.5010E+19 $\pm$ 6.27%	9.2870E+19 $\pm$ 2.52%	1.4193E+18 $\pm$ 16.57%	1.1760E+20 $\pm$ 2.26%
35.00	7.1579E+17 $\pm$ 20.38%	7.4881E+18 $\pm$ 9.61%	1.5271E+19 $\pm$ 6.54%	9.7233E+19 $\pm$ 2.46%	1.4767E+18 $\pm$ 14.50%	1.2219E+20 $\pm$ 2.24%

Table E-32. Five-group Photon Spectrum (m^2s^{-1}) in the Transplutonium Production Rod 1 Actinide Oxide/Aluminum Target. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-67.50	6.0840E+17 $\pm$ 21.16%	6.6214E+18 $\pm$ 9.40%	1.5599E+19 $\pm$ 6.24%	9.0317E+19 $\pm$ 2.68%	2.1335E+18 $\pm$ 14.80%	1.1528E+20 $\pm$ 2.36%
-95.00	b	7.4050E+18 $\pm$ 11.39%	1.7685E+19 $\pm$ 7.49%	8.7481E+19 $\pm$ 3.24%	2.5900E+18 $\pm$ 20.36%	1.1567E+20 $\pm$ 2.88%
-125.00	8.2405E+17 $\pm$ 18.20%	6.8270E+18 $\pm$ 7.79%	1.7427E+19 $\pm$ 5.32%	9.4859E+19 $\pm$ 2.40%	1.7553E+18 $\pm$ 17.71%	1.2169E+20 $\pm$ 2.10%
-170.00	7.7094E+17 $\pm$ 16.64%	7.0569E+18 $\pm$ 7.49%	1.8370E+19 $\pm$ 5.61%	9.6850E+19 $\pm$ 2.13%	2.1720E+18 $\pm$ 12.33%	1.2522E+20 $\pm$ 1.92%
-220.00	8.7958E+17 $\pm$ 17.97%	7.9878E+18 $\pm$ 6.90%	2.0058E+19 $\pm$ 4.47%	1.0255E+20 $\pm$ 2.25%	2.3226E+18 $\pm$ 13.69%	1.3380E+20 $\pm$ 1.93%
-270.00	7.8570E+17 $\pm$ 29.51%	8.1620E+18 $\pm$ 7.42%	1.9541E+19 $\pm$ 4.34%	1.0026E+20 $\pm$ 2.24%	1.8647E+18 $\pm$ 15.20%	1.3061E+20 $\pm$ 1.95%
-320.00	7.5597E+17 $\pm$ 23.05%	8.1012E+18 $\pm$ 6.78%	1.8738E+19 $\pm$ 4.66%	9.8256E+19 $\pm$ 2.17%	2.1801E+18 $\pm$ 12.33%	1.2803E+20 $\pm$ 1.89%
-370.00	6.8214E+17 $\pm$ 20.40%	8.3305E+18 $\pm$ 7.77%	1.8364E+19 $\pm$ 5.32%	8.7084E+19 $\pm$ 2.38%	1.7391E+18 $\pm$ 12.16%	1.1620E+20 $\pm$ 2.10%
-420.00	5.6672E+17 $\pm$ 19.39%	7.4664E+18 $\pm$ 8.61%	1.5728E+19 $\pm$ 4.73%	8.4710E+19 $\pm$ 2.41%	1.2725E+18 $\pm$ 16.28%	1.0974E+20 $\pm$ 2.09%
-470.00	8.6034E+17 $\pm$ 18.20%	6.7614E+18 $\pm$ 7.86%	1.2695E+19 $\pm$ 4.94%	7.0948E+19 $\pm$ 2.51%	1.6334E+18 $\pm$ 17.23%	9.2898E+19 $\pm$ 2.17%
-520.00	5.2748E+17 $\pm$ 20.23%	5.0849E+18 $\pm$ 8.10%	1.1104E+19 $\pm$ 6.16%	5.8396E+19 $\pm$ 2.73%	1.3527E+18 $\pm$ 15.79%	7.6465E+19 $\pm$ 2.44%
-570.00	4.2360E+17 $\pm$ 21.57%	2.1496E+18 $\pm$ 9.77%	6.4999E+18 $\pm$ 8.57%	4.1422E+19 $\pm$ 3.39%	1.1689E+18 $\pm$ 14.92%	5.1664E+19 $\pm$ 3.05%
-620.00	6.0557E+17 $\pm$ 20.81%	2.2547E+18 $\pm$ 13.37%	2.7297E+18 $\pm$ 8.70%	2.8921E+19 $\pm$ 4.47%	1.3557E+18 $\pm$ 16.36%	3.5867E+19 $\pm$ 3.90%
-670.00	4.9290E+17 $\pm$ 19.86%	1.2621E+18 $\pm$ 14.81%	2.2521E+18 $\pm$ 9.52%	1.8144E+19 $\pm$ 4.55%	9.1855E+17 $\pm$ 18.35%	2.3069E+19 $\pm$ 3.89%
-720.00	5.2957E+17 $\pm$ 19.03%	1.0456E+18 $\pm$ 19.48%	1.7437E+18 $\pm$ 9.92%	1.2980E+19 $\pm$ 5.40%	7.2684E+17 $\pm$ 17.00%	1.7026E+19 $\pm$ 4.51%
-770.00	3.4770E+17 $\pm$ 23.79%	1.2639E+18 $\pm$ 16.41%	1.3156E+18 $\pm$ 9.79%	1.1090E+19 $\pm$ 6.89%	7.0372E+17 $\pm$ 25.88%	1.4721E+19 $\pm$ 5.62%
-820.00	4.8775E+17 $\pm$ 23.12%	1.1991E+18 $\pm$ 28.43%	1.3501E+18 $\pm$ 18.65%	7.0627E+18 $\pm$ 6.83%	b	1.0578E+19 $\pm$ 6.34%
-892.00	3.9231E+17 $\pm$ 21.58%	8.3576E+17 $\pm$ 15.57%	9.0556E+17 $\pm$ 12.32%	5.2159E+18 $\pm$ 6.91%	3.1522E+17 $\pm$ 18.21%	7.6647E+18 $\pm$ 5.44%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-33. Five-group Photon Spectrum (m^2s^{-1}) in the Transplutonium Production Rod 1 Al-1100 Clad. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-73.61	b	6.0867E+18 $\pm$ 14.36%	1.4870E+19 $\pm$ 8.52%	8.8829E+19 $\pm$ 3.90%	1.2788E+18 $\pm$ 28.10%	1.1139E+20 $\pm$ 3.47%
-95.00	b	6.2812E+18 $\pm$ 12.82%	1.8386E+19 $\pm$ 8.69%	8.6690E+19 $\pm$ 4.32%	2.4830E+18 $\pm$ 23.57%	1.1474E+20 $\pm$ 3.70%
-125.00	7.7418E+17 $\pm$ 23.61%	6.7714E+18 $\pm$ 9.71%	1.8007E+19 $\pm$ 6.58%	9.1805E+19 $\pm$ 3.09%	1.9646E+18 $\pm$ 27.27%	1.1932E+20 $\pm$ 2.70%
-170.00	9.8975E+17 $\pm$ 19.94%	7.2869E+18 $\pm$ 9.43%	1.8935E+19 $\pm$ 5.45%	9.4496E+19 $\pm$ 2.75%	1.7923E+18 $\pm$ 17.01%	1.2350E+20 $\pm$ 2.38%
-220.00	9.9645E+17 $\pm$ 23.33%	9.1849E+18 $\pm$ 8.87%	2.0969E+19 $\pm$ 5.54%	9.8998E+19 $\pm$ 2.92%	1.7997E+18 $\pm$ 17.46%	1.3195E+20 $\pm$ 2.49%
-270.00	6.4961E+17 $\pm$ 23.06%	8.7183E+18 $\pm$ 9.88%	2.1523E+19 $\pm$ 5.56%	9.9374E+19 $\pm$ 2.72%	1.4446E+18 $\pm$ 19.39%	1.3171E+20 $\pm$ 2.39%
-320.00	6.3092E+17 $\pm$ 22.69%	9.3906E+18 $\pm$ 11.04%	2.0453E+19 $\pm$ 5.50%	9.8405E+19 $\pm$ 2.85%	1.4120E+18 $\pm$ 13.49%	1.3029E+20 $\pm$ 2.48%
-370.00	7.5554E+17 $\pm$ 24.85%	8.8866E+18 $\pm$ 9.90%	1.9169E+19 $\pm$ 6.02%	8.6429E+19 $\pm$ 2.83%	1.4544E+18 $\pm$ 14.11%	1.1669E+20 $\pm$ 2.47%
-420.00	7.2034E+17 $\pm$ 23.15%	8.3191E+18 $\pm$ 8.65%	1.6137E+19 $\pm$ 5.84%	7.8809E+19 $\pm$ 2.95%	8.7343E+17 $\pm$ 16.72%	1.0486E+20 $\pm$ 2.53%
-470.00	9.0034E+17 $\pm$ 23.34%	6.8785E+18 $\pm$ 9.88%	1.3723E+19 $\pm$ 6.40%	7.0145E+19 $\pm$ 3.08%	1.2823E+18 $\pm$ 18.89%	9.2929E+19 $\pm$ 2.68%
-532.61	4.7211E+17 $\pm$ 22.99%	5.0427E+18 $\pm$ 10.16%	1.0337E+19 $\pm$ 6.47%	5.3954E+19 $\pm$ 3.14%	9.2116E+17 $\pm$ 20.12%	7.0727E+19 $\pm$ 2.73%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-34. Five-group Photon Spectrum (m^2s^{-1}) in the Transplutonium Production Rod 1 Al-6061 Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-73.61	b	8.1466E+18 $\pm$ 17.35%	1.6413E+19 $\pm$ 9.74%	8.5185E+19 $\pm$ 4.60%	8.8781E+17 $\pm$ 13.14%	1.1091E+20 $\pm$ 4.11%
-95.00	b	7.4562E+18 $\pm$ 15.76%	1.8850E+19 $\pm$ 10.38%	7.7353E+19 $\pm$ 4.94%	9.5055E+17 $\pm$ 14.76%	1.0512E+20 $\pm$ 4.33%
-125.00	8.8964E+17 $\pm$ 28.18%	8.3597E+18 $\pm$ 11.06%	2.0959E+19 $\pm$ 7.37%	8.6265E+19 $\pm$ 3.79%	9.3280E+17 $\pm$ 13.64%	1.1741E+20 $\pm$ 3.25%
-170.00	1.3704E+18 $\pm$ 23.03%	8.6329E+18 $\pm$ 11.00%	2.1689E+19 $\pm$ 6.45%	9.2780E+19 $\pm$ 3.29%	9.7856E+17 $\pm$ 12.21%	1.2545E+20 $\pm$ 2.86%
-220.00	1.1601E+18 $\pm$ 21.97%	8.8215E+18 $\pm$ 10.08%	2.1928E+19 $\pm$ 6.12%	9.7605E+19 $\pm$ 3.27%	1.0219E+18 $\pm$ 9.95%	1.3054E+20 $\pm$ 2.80%
-270.00	7.6266E+17 $\pm$ 27.85%	8.7345E+18 $\pm$ 11.52%	2.3099E+19 $\pm$ 6.27%	9.5950E+19 $\pm$ 3.11%	1.1299E+18 $\pm$ 17.41%	1.2968E+20 $\pm$ 2.78%
-320.00	7.5567E+17 $\pm$ 25.43%	8.9466E+18 $\pm$ 10.80%	2.1860E+19 $\pm$ 6.67%	9.1085E+19 $\pm$ 3.44%	8.0623E+17 $\pm$ 9.77%	1.2345E+20 $\pm$ 2.98%
-370.00	1.2462E+18 $\pm$ 29.28%	8.2282E+18 $\pm$ 10.46%	2.1659E+19 $\pm$ 6.82%	8.0975E+19 $\pm$ 3.09%	7.0928E+17 $\pm$ 9.92%	1.1282E+20 $\pm$ 2.77%
-420.00	8.0667E+17 $\pm$ 28.39%	8.8122E+18 $\pm$ 10.28%	1.8230E+19 $\pm$ 7.11%	7.6027E+19 $\pm$ 3.42%	6.7858E+17 $\pm$ 11.34%	1.0455E+20 $\pm$ 2.98%
-470.00	9.1759E+17 $\pm$ 27.37%	6.7802E+18 $\pm$ 10.91%	1.4335E+19 $\pm$ 7.86%	6.8555E+19 $\pm$ 3.49%	7.2668E+17 $\pm$ 20.57%	9.1314E+19 $\pm$ 3.12%
-532.61	b	4.8117E+18 $\pm$ 10.94%	1.0911E+19 $\pm$ 6.91%	5.3083E+19 $\pm$ 3.48%	4.5465E+17 $\pm$ 9.69%	6.9698E+19 $\pm$ 3.08%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-35. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	$1.1717\text{E}+17 \pm 11.86\%$	$3.0234\text{E}+18 \pm 2.67\%$	$3.7207\text{E}+18 \pm 2.31\%$	$3.1302\text{E}+18 \pm 2.20\%$	$5.8516\text{E}+15 \pm 6.93\%$	$9.9974\text{E}+18 \pm 1.54\%$
950.00	$3.7111\text{E}+16 \pm 20.55\%$	$1.3148\text{E}+18 \pm 3.93\%$	$1.6807\text{E}+18 \pm 3.54\%$	$1.5074\text{E}+18 \pm 3.10\%$	$2.6938\text{E}+15 \pm 9.28\%$	$4.5428\text{E}+18 \pm 2.25\%$
1075.00	$2.5305\text{E}+16 \pm 20.90\%$	$6.3817\text{E}+17 \pm 4.85\%$	$8.4852\text{E}+17 \pm 4.08\%$	$8.1415\text{E}+17 \pm 3.70\%$	$1.6231\text{E}+15 \pm 10.51\%$	$2.3278\text{E}+18 \pm 2.67\%$
1250.00	$1.2990\text{E}+16 \pm 22.11\%$	$3.0873\text{E}+17 \pm 6.17\%$	$3.3087\text{E}+17 \pm 5.26\%$	$3.3993\text{E}+17 \pm 4.61\%$	$6.6687\text{E}+14 \pm 13.11\%$	$9.9318\text{E}+17 \pm 3.34\%$
1450.00	b	$1.7649\text{E}+17 \pm 7.46\%$	$2.0638\text{E}+17 \pm 7.11\%$	$1.6963\text{E}+17 \pm 6.05\%$	$3.1658\text{E}+14 \pm 18.03\%$	$5.5832\text{E}+17 \pm 4.46\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-36. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	$1.5193\text{E}+17 \pm 9.63\%$	$9.5421\text{E}+17 \pm 5.31\%$	$1.5812\text{E}+18 \pm 4.06\%$	$6.2144\text{E}+18 \pm 2.25\%$	$4.1313\text{E}+17 \pm 6.06\%$	$9.3149\text{E}+18 \pm 1.82\%$
850.00	$9.8915\text{E}+16 \pm 14.09\%$	$2.2235\text{E}+18 \pm 3.98\%$	$3.1180\text{E}+18 \pm 3.28\%$	$3.9292\text{E}+18 \pm 3.18\%$	$5.3173\text{E}+16 \pm 16.23\%$	$9.4228\text{E}+18 \pm 2.13\%$
950.00	$4.1165\text{E}+16 \pm 25.43\%$	$1.1230\text{E}+18 \pm 5.68\%$	$1.4086\text{E}+18 \pm 4.57\%$	$1.9079\text{E}+18 \pm 4.51\%$	$8.1927\text{E}+15 \pm 28.62\%$	$4.4889\text{E}+18 \pm 3.01\%$
1075.00	$2.2951\text{E}+16 \pm 28.14\%$	$5.1668\text{E}+17 \pm 6.73\%$	$7.2763\text{E}+17 \pm 5.52\%$	$9.1565\text{E}+17 \pm 5.01\%$	b	$2.1859\text{E}+18 \pm 3.45\%$
1250.00	b	$2.4005\text{E}+17 \pm 7.89\%$	$2.8285\text{E}+17 \pm 7.21\%$	$3.8384\text{E}+17 \pm 7.31\%$	b	$9.1831\text{E}+17 \pm 4.71\%$
1450.00	b	$1.3325\text{E}+17 \pm 10.24\%$	$1.5265\text{E}+17 \pm 9.84\%$	$1.9459\text{E}+17 \pm 9.26\%$	b	$4.8858\text{E}+17 \pm 6.00\%$
1650.00	$1.3163\text{E}+16 \pm 28.21\%$	$3.0046\text{E}+16 \pm 19.18\%$	$3.5456\text{E}+16 \pm 15.59\%$	$1.3166\text{E}+17 \pm 9.96\%$	$8.2226\text{E}+15 \pm 20.29\%$	$2.1855\text{E}+17 \pm 7.68\%$
1850.00	$9.5214\text{E}+15 \pm 26.22\%$	$8.8802\text{E}+15 \pm 23.28\%$	$2.0849\text{E}+16 \pm 15.24\%$	$5.5203\text{E}+16 \pm 11.00\%$	$2.8470\text{E}+15 \pm 24.60\%$	$9.7300\text{E}+16 \pm 8.74\%$
2115.95	$3.5585\text{E}+15 \pm 29.15\%$	$9.4497\text{E}+15 \pm 26.84\%$	$9.8728\text{E}+15 \pm 22.31\%$	$2.6690\text{E}+16 \pm 13.30\%$	b	$5.0681\text{E}+16 \pm 10.57\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-37. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 1 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.2968E+17 $\pm$ 10.32%	8.8264E+17 $\pm$ 5.18%	1.5055E+18 $\pm$ 3.57%	6.2739E+18 $\pm$ 2.10%	6.4376E+17 $\pm$ 5.96%	9.4355E+18 $\pm$ 1.70%
850.00	7.6716E+16 $\pm$ 13.24%	1.7266E+18 $\pm$ 2.87%	2.1817E+18 $\pm$ 2.35%	4.5577E+18 $\pm$ 2.23%	3.4735E+17 $\pm$ 7.29%	8.8901E+18 $\pm$ 1.51%
950.00	3.6265E+16 $\pm$ 16.69%	9.0223E+17 $\pm$ 4.03%	1.1601E+18 $\pm$ 3.49%	2.4524E+18 $\pm$ 2.93%	1.6640E+17 $\pm$ 9.92%	4.7174E+18 $\pm$ 2.03%
1075.00	2.6279E+16 $\pm$ 16.01%	4.4729E+17 $\pm$ 4.88%	5.8038E+17 $\pm$ 4.10%	1.3491E+18 $\pm$ 3.42%	1.0623E+17 $\pm$ 10.92%	2.5093E+18 $\pm$ 2.42%
1250.00	1.6511E+16 $\pm$ 23.65%	2.1202E+17 $\pm$ 6.30%	2.5251E+17 $\pm$ 5.31%	5.9153E+17 $\pm$ 4.23%	5.4890E+16 $\pm$ 13.99%	1.1275E+18 $\pm$ 3.04%
1450.00	6.5381E+15 $\pm$ 27.45%	1.3221E+17 $\pm$ 9.28%	1.4210E+17 $\pm$ 7.11%	2.5234E+17 $\pm$ 5.80%	2.2532E+16 $\pm$ 20.20%	5.5572E+17 $\pm$ 4.22%
1650.00	6.4215E+15 $\pm$ 23.22%	2.6994E+16 $\pm$ 19.94%	3.4607E+16 $\pm$ 15.27%	1.3588E+17 $\pm$ 9.88%	1.9173E+16 $\pm$ 21.88%	2.2307E+17 $\pm$ 7.55%
1850.00	5.9109E+15 $\pm$ 24.61%	b	1.8120E+16 $\pm$ 11.67%	6.8238E+16 $\pm$ 12.88%	b	1.1642E+17 $\pm$ 10.00%
2115.95	2.2018E+15 $\pm$ 27.48%	5.8519E+15 $\pm$ 21.45%	1.0244E+16 $\pm$ 21.38%	2.7763E+16 $\pm$ 12.62%	b	4.7492E+16 $\pm$ 9.95%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-38. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	1.1339E+17 $\pm$ 11.74%	3.1646E+18 $\pm$ 2.65%	3.8755E+18 $\pm$ 2.32%	3.1581E+18 $\pm$ 2.17%	5.3282E+15 $\pm$ 6.85%	1.0317E+19 $\pm$ 1.55%
950.00	5.6010E+16 $\pm$ 15.79%	1.3248E+18 $\pm$ 3.84%	1.7709E+18 $\pm$ 3.51%	1.6371E+18 $\pm$ 3.00%	2.4799E+15 $\pm$ 8.11%	4.7913E+18 $\pm$ 2.19%
1075.00	2.1796E+16 $\pm$ 19.19%	6.7865E+17 $\pm$ 4.40%	8.9724E+17 $\pm$ 3.95%	7.9657E+17 $\pm$ 3.60%	1.5971E+15 $\pm$ 9.45%	2.3959E+18 $\pm$ 2.57%
1250.00	1.5185E+16 $\pm$ 20.90%	2.9992E+17 $\pm$ 5.96%	3.8095E+17 $\pm$ 5.27%	3.5539E+17 $\pm$ 4.46%	7.5005E+14 $\pm$ 12.22%	1.0522E+18 $\pm$ 3.34%
1450.00	b	1.3560E+17 $\pm$ 7.99%	2.0132E+17 $\pm$ 6.42%	1.6912E+17 $\pm$ 5.87%	2.8813E+14 $\pm$ 18.16%	5.1535E+17 $\pm$ 4.33%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-39. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.4708E+17 $\pm$ 10.87%	1.1669E+18 $\pm$ 5.47%	1.6124E+18 $\pm$ 4.25%	6.5923E+18 $\pm$ 2.27%	3.9675E+17 $\pm$ 7.40%	9.9155E+18 $\pm$ 1.88%
850.00	1.2001E+17 $\pm$ 18.00%	2.4402E+18 $\pm$ 3.81%	3.2458E+18 $\pm$ 3.35%	3.9136E+18 $\pm$ 3.18%	5.5470E+16 $\pm$ 17.11%	9.7751E+18 $\pm$ 2.11%
950.00	5.4775E+16 $\pm$ 22.38%	1.1420E+18 $\pm$ 5.46%	1.5114E+18 $\pm$ 4.81%	1.9057E+18 $\pm$ 4.27%	b	4.6313E+18 $\pm$ 2.91%
1075.00	1.5886E+16 $\pm$ 20.97%	5.5972E+17 $\pm$ 5.92%	7.5887E+17 $\pm$ 5.65%	9.2863E+17 $\pm$ 5.15%	6.3765E+15 $\pm$ 27.59%	2.2695E+18 $\pm$ 3.46%
1250.00	8.4435E+15 $\pm$ 29.24%	2.4276E+17 $\pm$ 8.04%	3.0836E+17 $\pm$ 7.65%	4.2794E+17 $\pm$ 7.95%	b	9.8931E+17 $\pm$ 4.93%
1450.00	b	1.1136E+17 $\pm$ 11.45%	1.8209E+17 $\pm$ 9.60%	1.9905E+17 $\pm$ 9.59%	b	5.0052E+17 $\pm$ 6.31%
1650.00	7.8193E+15 $\pm$ 29.16%	2.8553E+16 $\pm$ 16.93%	2.9715E+16 $\pm$ 11.30%	1.1332E+17 $\pm$ 9.24%	6.9883E+15 $\pm$ 29.33%	1.8640E+17 $\pm$ 7.06%
1850.00	b	6.7270E+15 $\pm$ 23.54%	1.7920E+16 $\pm$ 16.19%	5.1201E+16 $\pm$ 10.74%	2.9503E+15 $\pm$ 26.48%	8.2041E+16 $\pm$ 8.58%
2115.95	b	5.6905E+15 $\pm$ 24.23%	7.9096E+15 $\pm$ 16.12%	2.5118E+16 $\pm$ 13.24%	b	4.4032E+16 $\pm$ 10.10%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-40. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 2 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.1287E+17 $\pm$ 10.08%	9.0604E+17 $\pm$ 4.90%	1.4187E+18 $\pm$ 3.59%	6.6280E+18 $\pm$ 2.00%	6.1380E+17 $\pm$ 5.92%	9.6794E+18 $\pm$ 1.64%
850.00	9.1601E+16 $\pm$ 10.99%	1.7606E+18 $\pm$ 2.70%	2.3181E+18 $\pm$ 2.35%	4.4816E+18 $\pm$ 2.16%	3.0519E+17 $\pm$ 9.53%	8.9571E+18 $\pm$ 1.47%
950.00	6.8742E+16 $\pm$ 16.99%	8.9701E+17 $\pm$ 4.01%	1.1690E+18 $\pm$ 3.44%	2.6084E+18 $\pm$ 2.92%	1.9377E+17 $\pm$ 9.96%	4.9370E+18 $\pm$ 2.03%
1075.00	2.8380E+16 $\pm$ 19.19%	4.5393E+17 $\pm$ 4.74%	6.3527E+17 $\pm$ 4.18%	1.3262E+18 $\pm$ 3.41%	1.1458E+17 $\pm$ 11.16%	2.5584E+18 $\pm$ 2.39%
1250.00	1.5611E+16 $\pm$ 24.39%	1.9888E+17 $\pm$ 6.06%	2.6052E+17 $\pm$ 5.62%	5.9863E+17 $\pm$ 4.68%	6.6407E+16 $\pm$ 12.20%	1.1400E+18 $\pm$ 3.24%
1450.00	6.0045E+15 $\pm$ 24.27%	8.9046E+16 $\pm$ 9.64%	1.2910E+17 $\pm$ 6.32%	2.9750E+17 $\pm$ 6.56%	2.1094E+16 $\pm$ 19.11%	5.4275E+17 $\pm$ 4.52%
1650.00	5.1255E+15 $\pm$ 25.37%	1.9445E+16 $\pm$ 15.18%	4.5305E+16 $\pm$ 20.12%	1.2034E+17 $\pm$ 9.19%	8.4392E+15 $\pm$ 24.53%	1.9866E+17 $\pm$ 7.72%
1850.00	b	5.3056E+15 $\pm$ 28.60%	1.5632E+16 $\pm$ 12.72%	6.6778E+16 $\pm$ 12.61%	9.8227E+15 $\pm$ 29.98%	1.0142E+17 $\pm$ 9.89%
2115.95	b	3.6949E+15 $\pm$ 26.89%	6.1522E+15 $\pm$ 10.59%	2.4592E+16 $\pm$ 12.40%	b	3.8930E+16 $\pm$ 9.30%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-41. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 3 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	1.3311E+17 ± 12.85%	3.0349E+18 ± 2.72%	3.9664E+18 ± 2.37%	3.2153E+18 ± 2.20%	5.9809E+15 ± 7.05%	1.0356E+19 ± 1.56%
950.00	4.6571E+16 ± 16.61%	1.3085E+18 ± 4.07%	1.7457E+18 ± 3.48%	1.5581E+18 ± 3.03%	3.2274E+15 ± 8.97%	4.6620E+18 ± 2.26%
1075.00	2.6105E+16 ± 21.65%	6.8071E+17 ± 4.65%	8.2982E+17 ± 4.08%	7.7074E+17 ± 3.57%	1.4029E+15 ± 10.61%	2.3088E+18 ± 2.67%
1250.00	7.4185E+15 ± 25.51%	3.1781E+17 ± 6.29%	3.8446E+17 ± 5.27%	3.4673E+17 ± 4.48%	7.6829E+14 ± 11.58%	1.0572E+18 ± 3.45%
1450.00	b	1.6637E+17 ± 6.99%	2.0929E+17 ± 8.40%	1.8275E+17 ± 6.26%	3.1997E+14 ± 23.06%	5.6346E+17 ± 4.68%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-42. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 3 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.6114E+17 ± 10.21%	1.1654E+18 ± 5.14%	1.5608E+18 ± 4.13%	6.2917E+18 ± 2.22%	4.1805E+17 ± 6.09%	9.5970E+18 ± 1.82%
850.00	1.0464E+17 ± 17.03%	2.4097E+18 ± 3.82%	3.2544E+18 ± 3.29%	3.8331E+18 ± 3.16%	6.2262E+16 ± 16.08%	9.6640E+18 ± 2.07%
950.00	4.5301E+16 ± 20.84%	1.1158E+18 ± 5.57%	1.4313E+18 ± 4.83%	1.8698E+18 ± 4.43%	1.9871E+16 ± 24.81%	4.4821E+18 ± 3.02%
1075.00	2.5967E+16 ± 27.00%	5.3956E+17 ± 6.44%	6.4488E+17 ± 5.33%	9.3141E+17 ± 5.26%	b	2.1448E+18 ± 3.47%
1250.00	b	2.3860E+17 ± 7.83%	3.3618E+17 ± 7.17%	4.4668E+17 ± 7.15%	b	1.0314E+18 ± 4.68%
1450.00	b	1.5453E+17 ± 9.84%	1.5286E+17 ± 11.46%	2.0244E+17 ± 9.00%	b	5.1446E+17 ± 6.25%
1650.00	b	2.6058E+16 ± 18.89%	3.6584E+16 ± 12.58%	1.1715E+17 ± 9.52%	8.5421E+15 ± 24.84%	1.9379E+17 ± 7.49%
1850.00	6.2261E+15 ± 28.08%	1.5201E+16 ± 25.30%	1.3706E+16 ± 8.72%	6.3761E+16 ± 14.00%	b	1.0097E+17 ± 10.13%
2115.95	b	6.9839E+15 ± 24.57%	8.0615E+15 ± 18.32%	2.7717E+16 ± 13.92%	2.1047E+15 ± 26.41%	4.5643E+16 ± 10.55%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-43. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 3 Al-6061 Sheath. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	$1.1504\text{E}+17 \pm 13.28\%$	$9.8881\text{E}+17 \pm 4.50\%$	$1.4287\text{E}+18 \pm 3.60\%$	$6.5958\text{E}+18 \pm 2.11\%$	$6.7692\text{E}+17 \pm 5.93\%$	$9.8053\text{E}+18 \pm 1.69\%$
850.00	$8.9093\text{E}+16 \pm 9.93\%$	$1.7018\text{E}+18 \pm 2.75\%$	$2.2266\text{E}+18 \pm 2.31\%$	$4.4523\text{E}+18 \pm 2.18\%$	$3.2707\text{E}+17 \pm 6.82\%$	$8.7969\text{E}+18 \pm 1.47\%$
950.00	$3.7282\text{E}+16 \pm 16.22\%$	$8.2965\text{E}+17 \pm 4.02\%$	$1.1650\text{E}+18 \pm 3.43\%$	$2.4263\text{E}+18 \pm 2.92\%$	$1.6566\text{E}+17 \pm 11.32\%$	$4.6238\text{E}+18 \pm 2.04\%$
1075.00	$2.1744\text{E}+16 \pm 18.36\%$	$4.4786\text{E}+17 \pm 4.80\%$	$6.0137\text{E}+17 \pm 4.28\%$	$1.3786\text{E}+18 \pm 3.47\%$	$8.8524\text{E}+16 \pm 11.21\%$	$2.5381\text{E}+18 \pm 2.46\%$
1250.00	b	$1.8595\text{E}+17 \pm 6.55\%$	$2.3952\text{E}+17 \pm 5.03\%$	$6.5769\text{E}+17 \pm 4.29\%$	$5.1164\text{E}+16 \pm 12.09\%$	$1.1449\text{E}+18 \pm 3.10\%$
1450.00	b	$9.9721\text{E}+16 \pm 7.18\%$	$1.3274\text{E}+17 \pm 7.16\%$	$2.7249\text{E}+17 \pm 6.49\%$	$2.5468\text{E}+16 \pm 18.29\%$	$5.3518\text{E}+17 \pm 4.34\%$
1650.00	b	$2.7041\text{E}+16 \pm 16.32\%$	$3.9158\text{E}+16 \pm 14.19\%$	$1.2397\text{E}+17 \pm 9.07\%$	$1.3736\text{E}+16 \pm 20.74\%$	$2.0952\text{E}+17 \pm 7.05\%$
1850.00	$4.7328\text{E}+15 \pm 27.67\%$	$1.1201\text{E}+16 \pm 19.70\%$	$1.4068\text{E}+16 \pm 11.41\%$	$5.8092\text{E}+16 \pm 13.29\%$	b	$9.3888\text{E}+16 \pm 9.39\%$
2115.95	b	$4.8173\text{E}+15 \pm 21.45\%$	$6.4368\text{E}+15 \pm 10.67\%$	$2.6518\text{E}+16 \pm 11.72\%$	$2.0473\text{E}+15 \pm 23.29\%$	$4.1462\text{E}+16 \pm 8.98\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-44. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Hafnium Absorber. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	$1.0593\text{E}+17 \pm 13.89\%$	$3.0660\text{E}+18 \pm 2.65\%$	$3.8019\text{E}+18 \pm 2.35\%$	$3.2271\text{E}+18 \pm 2.28\%$	$5.4657\text{E}+15 \pm 6.01\%$	$1.0206\text{E}+19 \pm 1.56\%$
950.00	$3.7309\text{E}+16 \pm 19.48\%$	$1.3481\text{E}+18 \pm 4.02\%$	$1.7228\text{E}+18 \pm 3.48\%$	$1.5225\text{E}+18 \pm 3.03\%$	$2.9628\text{E}+15 \pm 9.78\%$	$4.6337\text{E}+18 \pm 2.25\%$
1075.00	$2.9974\text{E}+16 \pm 16.98\%$	$6.7042\text{E}+17 \pm 4.63\%$	$7.8822\text{E}+17 \pm 4.12\%$	$8.0818\text{E}+17 \pm 3.48\%$	$1.4963\text{E}+15 \pm 11.08\%$	$2.2983\text{E}+18 \pm 2.58\%$
1250.00	$1.0957\text{E}+16 \pm 22.98\%$	$3.0641\text{E}+17 \pm 5.80\%$	$3.5796\text{E}+17 \pm 5.26\%$	$3.4520\text{E}+17 \pm 4.74\%$	$7.2199\text{E}+14 \pm 12.25\%$	$1.0213\text{E}+18 \pm 3.38\%$
1450.00	b	$1.4142\text{E}+17 \pm 7.21\%$	$2.0957\text{E}+17 \pm 6.34\%$	$1.8165\text{E}+17 \pm 5.56\%$	$3.8292\text{E}+14 \pm 15.54\%$	$5.3595\text{E}+17 \pm 4.18\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-45. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.3303E+17 $\pm$ 10.15%	1.2228E+18 $\pm$ 5.22%	1.5357E+18 $\pm$ 4.05%	6.7060E+18 $\pm$ 2.24%	4.2169E+17 $\pm$ 6.02%	1.0019E+19 $\pm$ 1.84%
850.00	8.5028E+16 $\pm$ 16.75%	2.3825E+18 $\pm$ 3.76%	3.1188E+18 $\pm$ 3.36%	3.9051E+18 $\pm$ 3.24%	4.8056E+16 $\pm$ 14.29%	9.5395E+18 $\pm$ 2.10%
950.00	3.0346E+16 $\pm$ 26.34%	1.1453E+18 $\pm$ 5.12%	1.4635E+18 $\pm$ 4.51%	1.9621E+18 $\pm$ 4.81%	b	4.6158E+18 $\pm$ 2.98%
1075.00	2.1447E+16 $\pm$ 21.79%	4.6227E+17 $\pm$ 6.09%	6.4680E+17 $\pm$ 5.94%	1.0170E+18 $\pm$ 5.21%	6.3164E+15 $\pm$ 29.41%	2.1539E+18 $\pm$ 3.55%
1250.00	b	2.5313E+17 $\pm$ 8.47%	2.9758E+17 $\pm$ 7.01%	3.6269E+17 $\pm$ 7.44%	b	9.2757E+17 $\pm$ 4.61%
1450.00	b	1.0878E+17 $\pm$ 11.00%	1.5640E+17 $\pm$ 8.75%	2.0349E+17 $\pm$ 8.94%	b	4.7392E+17 $\pm$ 5.81%
1650.00	b	3.1621E+16 $\pm$ 17.38%	3.1817E+16 $\pm$ 11.57%	1.3631E+17 $\pm$ 9.07%	5.8198E+15 $\pm$ 23.07%	2.0846E+17 $\pm$ 7.08%
1850.00	5.2030E+15 $\pm$ 25.62%	7.8001E+15 $\pm$ 24.87%	1.4165E+16 $\pm$ 16.77%	6.3475E+16 $\pm$ 11.12%	5.2723E+15 $\pm$ 23.46%	9.5915E+16 $\pm$ 9.05%
2115.95	b	6.2248E+15 $\pm$ 20.80%	1.1787E+16 $\pm$ 25.19%	3.3499E+16 $\pm$ 11.87%	b	5.5358E+16 $\pm$ 10.28%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-46. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 4 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.0016E+17 $\pm$ 10.95%	9.9407E+17 $\pm$ 4.62%	1.4359E+18 $\pm$ 3.83%	6.8225E+18 $\pm$ 2.12%	6.3131E+17 $\pm$ 6.16%	9.9840E+18 $\pm$ 1.72%
850.00	7.0811E+16 $\pm$ 11.66%	1.7271E+18 $\pm$ 2.75%	2.2607E+18 $\pm$ 2.32%	4.4563E+18 $\pm$ 2.19%	3.6788E+17 $\pm$ 6.42%	8.8827E+18 $\pm$ 1.45%
950.00	3.3998E+16 $\pm$ 19.39%	9.0035E+17 $\pm$ 4.02%	1.1229E+18 $\pm$ 3.45%	2.4683E+18 $\pm$ 2.84%	1.7979E+17 $\pm$ 9.31%	4.7052E+18 $\pm$ 1.99%
1075.00	2.8900E+16 $\pm$ 17.69%	4.6767E+17 $\pm$ 4.82%	5.2749E+17 $\pm$ 4.22%	1.2884E+18 $\pm$ 3.38%	9.7149E+16 $\pm$ 10.93%	2.4096E+18 $\pm$ 2.38%
1250.00	1.2608E+16 $\pm$ 23.70%	1.9551E+17 $\pm$ 5.46%	2.5415E+17 $\pm$ 5.29%	5.9666E+17 $\pm$ 4.10%	4.6129E+16 $\pm$ 14.93%	1.1051E+18 $\pm$ 2.93%
1450.00	b	9.9512E+16 $\pm$ 8.04%	1.3648E+17 $\pm$ 5.93%	2.5841E+17 $\pm$ 6.03%	2.7950E+16 $\pm$ 22.95%	5.2495E+17 $\pm$ 4.16%
1650.00	b	2.1437E+16 $\pm$ 15.05%	2.9732E+16 $\pm$ 11.83%	1.3591E+17 $\pm$ 8.80%	1.2111E+16 $\pm$ 25.21%	2.0232E+17 $\pm$ 6.89%
1850.00	b	5.8549E+15 $\pm$ 24.14%	1.3506E+16 $\pm$ 14.55%	7.2485E+16 $\pm$ 11.38%	8.2274E+15 $\pm$ 25.24%	1.0340E+17 $\pm$ 9.43%
2115.95	b	4.5455E+15 $\pm$ 20.06%	7.3761E+15 $\pm$ 9.78%	3.0477E+16 $\pm$ 10.98%	b	4.5431E+16 $\pm$ 8.33%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-47. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Hafnium Absorber. Normalized to 330 MFf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	1.1282E+17 ± 11.98%	3.1326E+18 ± 2.62%	3.8366E+18 ± 2.31%	3.2677E+18 ± 2.15%	6.0102E+15 ± 6.13%	1.0356E+19 ± 1.53%
950.00	4.9770E+16 ± 19.92%	1.3385E+18 ± 4.03%	1.5303E+18 ± 3.52%	1.3822E+18 ± 3.16%	2.6892E+15 ± 8.24%	4.3034E+18 ± 2.27%
1075.00	1.6682E+16 ± 21.12%	6.5281E+17 ± 4.66%	8.5795E+17 ± 4.10%	7.3826E+17 ± 3.66%	1.6653E+15 ± 9.63%	2.2674E+18 ± 2.64%
1250.00	9.1225E+15 ± 29.60%	3.0410E+17 ± 6.14%	3.6503E+17 ± 5.65%	3.2875E+17 ± 4.55%	6.4319E+14 ± 12.50%	1.0077E+18 ± 3.53%
1450.00	b ± 25.60%	1.5673E+17 ± 7.49%	1.9410E+17 ± 6.70%	1.8454E+17 ± 6.50%	3.9818E+14 ± 17.93%	5.4161E+17 ± 4.41%
a No particle interactions recorded.						
b Poor statistics; value not reported.						

Table E-48. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Al-6061 Support Tube. Normalized to 330 MFf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.6661E+17 ± 9.63%	1.0873E+18 ± 5.17%	1.5243E+18 ± 4.21%	6.3654E+18 ± 2.30%	4.4392E+17 ± 6.20%	9.5875E+18 ± 1.90%
850.00	9.6712E+16 ± 15.56%	2.3735E+18 ± 3.73%	2.9545E+18 ± 3.32%	3.9936E+18 ± 3.11%	5.3061E+16 ± 18.64%	9.4714E+18 ± 2.07%
950.00	4.6073E+16 ± 24.16%	1.0420E+18 ± 5.42%	1.3686E+18 ± 4.85%	1.6560E+18 ± 4.71%	b	4.1268E+18 ± 3.05%
1075.00	b	5.4086E+17 ± 6.54%	7.1162E+17 ± 5.67%	8.6209E+17 ± 5.35%	b	2.1432E+18 ± 3.60%
1250.00	b	2.1822E+17 ± 8.42%	2.9933E+17 ± 7.89%	3.8403E+17 ± 7.03%	b	9.1183E+17 ± 4.82%
1450.00	b	1.4051E+17 ± 9.60%	1.6963E+17 ± 9.75%	1.9540E+17 ± 9.00%	b	5.1053E+17 ± 5.80%
1650.00	9.2209E+15 ± 25.60%	1.9013E+16 ± 18.45%	4.6268E+16 ± 14.94%	1.2396E+17 ± 9.19%	7.5904E+15 ± 20.62%	2.0605E+17 ± 7.06%
1850.00	6.4404E+15 ± 26.07%	1.2540E+16 ± 24.11%	1.5937E+16 ± 13.37%	6.0358E+16 ± 11.77%	3.2235E+15 ± 25.55%	9.8499E+16 ± 8.75%
2115.95	b ± 25.60%	6.3783E+15 ± 25.56%	6.4906E+15 ± 9.29%	2.2394E+16 ± 12.08%	1.7367E+15 ± 28.11%	4.0136E+16 ± 9.35%
a No particle interactions recorded.						
b Poor statistics; value not reported.						

Table E-49. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 5 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.2755E+17 $\pm$ 9.59%	9.2491E+17 $\pm$ 4.92%	1.4351E+18 $\pm$ 3.76%	6.9023E+18 $\pm$ 2.18%	6.5812E+17 $\pm$ 5.83%	1.0048E+19 $\pm$ 1.76%
850.00	9.3247E+16 $\pm$ 10.80%	1.7458E+18 $\pm$ 2.69%	2.3209E+18 $\pm$ 2.35%	4.6295E+18 $\pm$ 2.27%	3.7046E+17 $\pm$ 7.49%	9.1599E+18 $\pm$ 1.50%
950.00	4.4749E+16 $\pm$ 17.91%	8.7669E+17 $\pm$ 4.12%	1.1793E+18 $\pm$ 3.58%	2.4141E+18 $\pm$ 3.11%	1.8078E+17 $\pm$ 10.51%	4.6956E+18 $\pm$ 2.12%
1075.00	2.0193E+16 $\pm$ 19.46%	4.2882E+17 $\pm$ 4.70%	5.6550E+17 $\pm$ 3.94%	1.3833E+18 $\pm$ 3.45%	1.1194E+17 $\pm$ 11.45%	2.5097E+18 $\pm$ 2.43%
1250.00	7.6826E+15 $\pm$ 28.18%	1.8830E+17 $\pm$ 6.02%	2.6297E+17 $\pm$ 5.46%	6.4153E+17 $\pm$ 4.45%	5.5487E+16 $\pm$ 19.00%	1.1560E+18 $\pm$ 3.23%
1450.00	b	1.0590E+17 $\pm$ 7.84%	1.4729E+17 $\pm$ 7.85%	2.8771E+17 $\pm$ 6.65%	2.2653E+16 $\pm$ 19.96%	5.6886E+17 $\pm$ 4.59%
1650.00	b	1.8223E+16 $\pm$ 17.78%	4.5248E+16 $\pm$ 14.69%	1.2928E+17 $\pm$ 8.46%	1.2878E+16 $\pm$ 26.04%	2.1160E+17 $\pm$ 6.76%
1850.00	5.4207E+15 $\pm$ 26.11%	8.9455E+15 $\pm$ 22.95%	2.1069E+16 $\pm$ 19.70%	5.8841E+16 $\pm$ 10.88%	7.6713E+15 $\pm$ 25.46%	1.0195E+17 $\pm$ 8.64%
2115.95	b	4.9939E+15 $\pm$ 23.12%	6.8015E+15 $\pm$ 9.61%	2.8788E+16 $\pm$ 12.97%	b	4.5161E+16 $\pm$ 9.68%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-50. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 6 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	9.4758E+16 $\pm$ 13.54%	2.8967E+18 $\pm$ 2.78%	3.8667E+18 $\pm$ 2.39%	3.1615E+18 $\pm$ 2.21%	5.8062E+15 $\pm$ 5.86%	1.0025E+19 $\pm$ 1.58%
950.00	5.1266E+16 $\pm$ 14.39%	1.3328E+18 $\pm$ 3.92%	1.6778E+18 $\pm$ 3.57%	1.5010E+18 $\pm$ 3.13%	2.5876E+15 $\pm$ 9.52%	4.5655E+18 $\pm$ 2.28%
1075.00	3.0709E+16 $\pm$ 16.72%	6.7738E+17 $\pm$ 4.66%	8.2426E+17 $\pm$ 4.06%	7.7883E+17 $\pm$ 3.59%	1.6943E+15 $\pm$ 14.50%	2.3129E+18 $\pm$ 2.65%
1250.00	b	2.6636E+17 $\pm$ 6.17%	3.4838E+17 $\pm$ 5.27%	3.2756E+17 $\pm$ 4.73%	6.4659E+14 $\pm$ 12.08%	9.5188E+17 $\pm$ 3.47%
1450.00	b	1.4123E+17 $\pm$ 7.70%	1.8599E+17 $\pm$ 6.57%	1.7711E+17 $\pm$ 5.88%	3.6030E+14 $\pm$ 18.88%	5.0750E+17 $\pm$ 4.38%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-51. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 6 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.6195E+17 $\pm$ 9.75%	1.1062E+18 $\pm$ 5.01%	1.5411E+18 $\pm$ 3.88%	6.5086E+18 $\pm$ 2.33%	3.7198E+17 $\pm$ 6.02%	9.6898E+18 $\pm$ 1.87%
850.00	8.2305E+16 $\pm$ 16.36%	2.2019E+18 $\pm$ 3.94%	3.1567E+18 $\pm$ 3.27%	3.7785E+18 $\pm$ 3.05%	5.4969E+16 $\pm$ 15.28%	9.2744E+18 $\pm$ 2.08%
950.00	b	1.1252E+18 $\pm$ 5.39%	1.3320E+18 $\pm$ 4.71%	1.7689E+18 $\pm$ 4.43%	b	4.3023E+18 $\pm$ 2.97%
1075.00	2.5406E+16 $\pm$ 22.47%	5.4577E+17 $\pm$ 6.51%	7.1280E+17 $\pm$ 5.96%	9.4137E+17 $\pm$ 5.30%	b	2.2322E+18 $\pm$ 3.61%
1250.00	b	2.4271E+17 $\pm$ 8.45%	2.9232E+17 $\pm$ 7.30%	3.8593E+17 $\pm$ 7.28%	b	9.3411E+17 $\pm$ 4.71%
1450.00	b	1.2609E+17 $\pm$ 10.99%	1.6435E+17 $\pm$ 9.22%	2.0801E+17 $\pm$ 8.27%	b	5.0095E+17 $\pm$ 5.74%
1650.00	b	1.9288E+16 $\pm$ 18.40%	3.1074E+16 $\pm$ 13.50%	1.1966E+17 $\pm$ 8.70%	b	1.8337E+17 $\pm$ 7.27%
1850.00	b	7.4893E+15 $\pm$ 25.50%	2.0734E+16 $\pm$ 16.34%	7.3682E+16 $\pm$ 14.16%	2.3573E+15 $\pm$ 29.07%	1.0620E+17 $\pm$ 10.98%
2115.95	b	b	8.5058E+15 $\pm$ 16.01%	2.6416E+16 $\pm$ 16.33%	1.3131E+15 $\pm$ 24.42%	4.3588E+16 $\pm$ 12.70%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-52. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 6 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.1163E+17 $\pm$ 10.55%	9.1737E+17 $\pm$ 4.70%	1.3415E+18 $\pm$ 3.47%	6.4713E+18 $\pm$ 2.05%	6.8479E+17 $\pm$ 6.03%	9.5266E+18 $\pm$ 1.66%
850.00	7.3317E+16 $\pm$ 11.79%	1.6660E+18 $\pm$ 2.86%	2.2171E+18 $\pm$ 2.30%	4.3664E+18 $\pm$ 2.17%	3.5637E+17 $\pm$ 7.45%	8.6791E+18 $\pm$ 1.48%
950.00	6.0848E+16 $\pm$ 15.86%	8.1857E+17 $\pm$ 4.05%	1.0950E+18 $\pm$ 3.67%	2.4905E+18 $\pm$ 2.84%	1.6193E+17 $\pm$ 8.96%	4.6269E+18 $\pm$ 2.03%
1075.00	2.9552E+16 $\pm$ 15.45%	4.4172E+17 $\pm$ 4.62%	5.6723E+17 $\pm$ 4.27%	1.2977E+18 $\pm$ 3.41%	9.7434E+16 $\pm$ 12.00%	2.4337E+18 $\pm$ 2.41%
1250.00	8.7464E+15 $\pm$ 23.97%	1.6811E+17 $\pm$ 6.07%	2.4271E+17 $\pm$ 5.40%	6.0262E+17 $\pm$ 4.41%	4.9521E+16 $\pm$ 19.34%	1.0717E+18 $\pm$ 3.22%
1450.00	b	8.9768E+16 $\pm$ 7.81%	1.1508E+17 $\pm$ 7.75%	2.7306E+17 $\pm$ 6.27%	1.8240E+16 $\pm$ 19.71%	5.0023E+17 $\pm$ 4.42%
1650.00	4.5202E+15 $\pm$ 28.78%	2.1998E+16 $\pm$ 25.77%	3.1327E+16 $\pm$ 13.74%	1.3882E+17 $\pm$ 9.03%	7.9107E+15 $\pm$ 26.35%	2.0457E+17 $\pm$ 7.42%
1850.00	b	b	1.8545E+16 $\pm$ 13.02%	7.3078E+16 $\pm$ 12.17%	b	1.0870E+17 $\pm$ 10.57%
2115.95	b	3.6795E+15 $\pm$ 25.58%	7.4886E+15 $\pm$ 15.54%	2.6224E+16 $\pm$ 13.12%	b	4.1235E+16 $\pm$ 10.05%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-53. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	1.0495E+17 $\pm$ 10.69%	2.9670E+18 $\pm$ 2.66%	3.6043E+18 $\pm$ 2.41%	2.9043E+18 $\pm$ 2.21%	4.7885E+15 $\pm$ 6.82%	9.5854E+18 $\pm$ 1.57%
950.00	4.0928E+16 $\pm$ 15.82%	1.2919E+18 $\pm$ 3.90%	1.6728E+18 $\pm$ 3.44%	1.5421E+18 $\pm$ 3.07%	2.6268E+15 $\pm$ 9.11%	4.5503E+18 $\pm$ 2.21%
1075.00	2.6383E+16 $\pm$ 18.98%	6.4694E+17 $\pm$ 4.96%	8.3115E+17 $\pm$ 4.16%	7.6510E+17 $\pm$ 3.57%	1.5842E+15 $\pm$ 15.18%	2.2712E+18 $\pm$ 2.67%
1250.00	1.0839E+16 $\pm$ 21.59%	2.7769E+17 $\pm$ 5.68%	3.4461E+17 $\pm$ 5.12%	3.4883E+17 $\pm$ 4.70%	8.1038E+14 $\pm$ 13.35%	9.8278E+17 $\pm$ 3.34%
1450.00	b	1.3602E+17 $\pm$ 7.51%	1.8558E+17 $\pm$ 6.91%	1.7302E+17 $\pm$ 6.17%	4.5258E+14 $\pm$ 20.85%	5.0721E+17 $\pm$ 4.40%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-54. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.3591E+17 $\pm$ 10.18%	1.1023E+18 $\pm$ 5.14%	1.5115E+18 $\pm$ 4.12%	6.2793E+18 $\pm$ 2.30%	3.7336E+17 $\pm$ 6.23%	9.4023E+18 $\pm$ 1.90%
850.00	1.1015E+17 $\pm$ 15.35%	2.3992E+18 $\pm$ 3.84%	2.7587E+18 $\pm$ 3.53%	3.4500E+18 $\pm$ 3.30%	4.3817E+16 $\pm$ 17.51%	8.7618E+18 $\pm$ 2.17%
950.00	5.0412E+16 $\pm$ 20.36%	1.1592E+18 $\pm$ 5.54%	1.5243E+18 $\pm$ 4.89%	1.9671E+18 $\pm$ 4.95%	b	4.7109E+18 $\pm$ 3.15%
1075.00	3.2800E+16 $\pm$ 25.17%	5.2062E+17 $\pm$ 6.77%	7.4789E+17 $\pm$ 5.69%	9.0912E+17 $\pm$ 5.39%	b	2.2169E+18 $\pm$ 3.61%
1250.00	1.1473E+16 $\pm$ 26.61%	2.8352E+17 $\pm$ 7.86%	2.9651E+17 $\pm$ 6.76%	3.8058E+17 $\pm$ 6.69%	b	9.7614E+17 $\pm$ 4.41%
1450.00	b	1.1289E+17 $\pm$ 11.54%	1.6991E+17 $\pm$ 10.19%	1.7715E+17 $\pm$ 8.71%	b	4.7030E+17 $\pm$ 6.27%
1650.00	8.5629E+15 $\pm$ 23.93%	2.0965E+16 $\pm$ 17.26%	3.2296E+16 $\pm$ 13.98%	1.3641E+17 $\pm$ 9.79%	9.1580E+15 $\pm$ 28.53%	2.0739E+17 $\pm$ 7.72%
1850.00	b	1.3351E+16 $\pm$ 21.38%	1.4669E+16 $\pm$ 17.68%	5.0780E+16 $\pm$ 12.80%	2.6006E+15 $\pm$ 25.18%	8.8325E+16 $\pm$ 9.66%
2115.95	b	5.2066E+15 $\pm$ 24.71%	7.2980E+15 $\pm$ 14.03%	1.7419E+16 $\pm$ 12.97%	b	3.3357E+16 $\pm$ 9.40%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-55. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 7 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	$1.2277\text{E}+17 \pm 12.84\%$	$8.6294\text{E}+17 \pm 4.58\%$	$1.4126\text{E}+18 \pm 3.62\%$	$6.5756\text{E}+18 \pm 2.19\%$	$6.1847\text{E}+17 \pm 6.85\%$	$9.5924\text{E}+18 \pm 1.79\%$
850.00	$8.8124\text{E}+16 \pm 10.98\%$	$1.6234\text{E}+18 \pm 2.72\%$	$2.1337\text{E}+18 \pm 2.32\%$	$4.2597\text{E}+18 \pm 2.22\%$	$3.0196\text{E}+17 \pm 8.63\%$	$8.4069\text{E}+18 \pm 1.49\%$
950.00	$4.1988\text{E}+16 \pm 15.60\%$	$8.5541\text{E}+17 \pm 3.99\%$	$1.1529\text{E}+18 \pm 3.39\%$	$2.5385\text{E}+18 \pm 2.77\%$	$1.8710\text{E}+17 \pm 9.16\%$	$4.7759\text{E}+18 \pm 1.97\%$
1075.00	$2.2434\text{E}+16 \pm 16.59\%$	$4.1796\text{E}+17 \pm 5.21\%$	$5.5709\text{E}+17 \pm 4.07\%$	$1.3954\text{E}+18 \pm 3.22\%$	$9.5350\text{E}+16 \pm 10.57\%$	$2.4882\text{E}+18 \pm 2.38\%$
1250.00	$1.5705\text{E}+16 \pm 20.84\%$	$1.9810\text{E}+17 \pm 6.42\%$	$2.2063\text{E}+17 \pm 5.42\%$	$6.5005\text{E}+17 \pm 4.39\%$	$5.1330\text{E}+16 \pm 14.80\%$	$1.1358\text{E}+18 \pm 3.14\%$
1450.00	$1.1555\text{E}+16 \pm 27.65\%$	$1.0230\text{E}+17 \pm 9.15\%$	$1.1860\text{E}+17 \pm 7.06\%$	$2.7391\text{E}+17 \pm 6.27\%$	$1.9573\text{E}+16 \pm 19.53\%$	$5.2594\text{E}+17 \pm 4.36\%$
1650.00	$6.0054\text{E}+15 \pm 23.05\%$	$1.8174\text{E}+16 \pm 16.56\%$	$2.8898\text{E}+16 \pm 13.24\%$	$1.3623\text{E}+17 \pm 8.41\%$	$1.3528\text{E}+16 \pm 25.25\%$	$2.0284\text{E}+17 \pm 6.93\%$
1850.00	^b	$1.0494\text{E}+16 \pm 22.83\%$	$1.3671\text{E}+16 \pm 12.86\%$	$5.5274\text{E}+16 \pm 11.74\%$	$4.9132\text{E}+15 \pm 27.15\%$	$8.8460\text{E}+16 \pm 8.85\%$
2115.95	$1.6392\text{E}+15 \pm 29.65\%$	$4.6496\text{E}+15 \pm 24.30\%$	$9.2509\text{E}+15 \pm 14.54\%$	$1.7798\text{E}+16 \pm 11.18\%$	^b	$3.5519\text{E}+16 \pm 8.41\%$

^a No particle interactions recorded.

^b Poor statistics; value not reported.

Table E-56. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 8 Hafnium Absorber. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
850.00	$1.0053\text{E}+17 \pm 13.31\%$	$2.9674\text{E}+18 \pm 2.72\%$	$3.5859\text{E}+18 \pm 2.35\%$	$3.0716\text{E}+18 \pm 2.23\%$	$5.8399\text{E}+15 \pm 6.64\%$	$9.7313\text{E}+18 \pm 1.58\%$
950.00	$6.7345\text{E}+16 \pm 17.41\%$	$1.3332\text{E}+18 \pm 4.19\%$	$1.8949\text{E}+18 \pm 3.62\%$	$1.5002\text{E}+18 \pm 3.08\%$	$2.9283\text{E}+15 \pm 10.04\%$	$4.5986\text{E}+18 \pm 2.35\%$
1075.00	$2.8949\text{E}+16 \pm 18.33\%$	$5.8729\text{E}+17 \pm 4.58\%$	$8.3840\text{E}+17 \pm 4.28\%$	$7.8661\text{E}+17 \pm 3.49\%$	$1.5696\text{E}+15 \pm 11.38\%$	$2.2428\text{E}+18 \pm 2.64\%$
1250.00	$1.0350\text{E}+16 \pm 22.11\%$	$2.7818\text{E}+17 \pm 5.84\%$	$3.3495\text{E}+17 \pm 5.36\%$	$3.5466\text{E}+17 \pm 4.39\%$	$6.3721\text{E}+14 \pm 12.88\%$	$9.7878\text{E}+17 \pm 3.34\%$
1450.00	^b	$1.8944\text{E}+17 \pm 8.22\%$	$1.6292\text{E}+17 \pm 6.83\%$	$1.8114\text{E}+17 \pm 6.18\%$	$3.4924\text{E}+14 \pm 18.23\%$	$5.4252\text{E}+17 \pm 4.63\%$

^a No particle interactions recorded.

^b Poor statistics; value not reported.

Table E-57. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 8 Al-6061 Support Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.4068E+17 $\pm$ 10.56%	1.1139E+18 $\pm$ 5.50%	1.4955E+18 $\pm$ 3.97%	6.5186E+18 $\pm$ 2.26%	3.9276E+17 $\pm$ 6.66%	9.6615E+18 $\pm$ 1.86%
850.00	9.1895E+16 $\pm$ 20.01%	2.1492E+18 $\pm$ 4.36%	2.9069E+18 $\pm$ 3.51%	3.7326E+18 $\pm$ 3.18%	4.5896E+16 $\pm$ 14.51%	8.9265E+18 $\pm$ 2.20%
950.00	5.5445E+16 $\pm$ 19.29%	1.0746E+18 $\pm$ 5.70%	1.4090E+18 $\pm$ 4.86%	1.7758E+18 $\pm$ 4.65%	1.1934E+16 $\pm$ 28.00%	4.3268E+18 $\pm$ 3.12%
1075.00	2.5622E+16 $\pm$ 21.03%	5.2483E+17 $\pm$ 6.55%	6.8841E+17 $\pm$ 5.85%	9.7903E+17 $\pm$ 5.22%	b	2.2215E+18 $\pm$ 3.56%
1250.00	1.0467E+16 $\pm$ 29.11%	2.2323E+17 $\pm$ 9.07%	2.8726E+17 $\pm$ 7.47%	3.8560E+17 $\pm$ 6.65%	b	9.1062E+17 $\pm$ 4.69%
1450.00	b	1.4256E+17 $\pm$ 11.20%	1.2395E+17 $\pm$ 8.80%	2.2586E+17 $\pm$ 9.82%	b	5.0113E+17 $\pm$ 6.18%
1650.00	b	2.1515E+16 $\pm$ 20.68%	3.2819E+16 $\pm$ 12.11%	1.1379E+17 $\pm$ 11.34%	5.5883E+15 $\pm$ 25.40%	1.7975E+17 $\pm$ 8.38%
1850.00	b	1.7551E+16 $\pm$ 24.35%	1.3905E+16 $\pm$ 10.21%	5.9936E+16 $\pm$ 13.03%	2.7036E+15 $\pm$ 24.21%	9.7052E+16 $\pm$ 9.81%
2115.95	b	4.2202E+15 $\pm$ 27.67%	6.7904E+15 $\pm$ 11.54%	3.0012E+16 $\pm$ 13.29%	1.3256E+15 $\pm$ 27.60%	4.4239E+16 $\pm$ 10.21%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-58. Five-group Photon Spectrum (m^2s^{-1}) in the Safety Shutdown Rod 8 Al-6061 Sheath. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
767.62	1.1711E+17 $\pm$ 11.38%	9.0736E+17 $\pm$ 4.67%	1.3532E+18 $\pm$ 3.50%	6.7338E+18 $\pm$ 2.07%	6.0566E+17 $\pm$ 6.17%	9.7171E+18 $\pm$ 1.68%
850.00	8.3806E+16 $\pm$ 10.74%	1.6236E+18 $\pm$ 2.82%	2.2064E+18 $\pm$ 2.39%	4.1580E+18 $\pm$ 2.15%	3.0190E+17 $\pm$ 7.89%	8.3737E+18 $\pm$ 1.47%
950.00	4.2592E+16 $\pm$ 15.13%	8.5780E+17 $\pm$ 4.06%	1.1652E+18 $\pm$ 3.55%	2.4602E+18 $\pm$ 2.96%	2.0254E+17 $\pm$ 11.06%	4.7283E+18 $\pm$ 2.08%
1075.00	2.6069E+16 $\pm$ 14.66%	4.0700E+17 $\pm$ 5.01%	5.7175E+17 $\pm$ 4.13%	1.3275E+18 $\pm$ 3.44%	9.4945E+16 $\pm$ 11.74%	2.4272E+18 $\pm$ 2.47%
1250.00	1.1906E+16 $\pm$ 22.30%	1.7013E+17 $\pm$ 6.16%	2.4251E+17 $\pm$ 5.10%	6.2353E+17 $\pm$ 4.46%	2.9634E+16 $\pm$ 11.71%	1.0777E+18 $\pm$ 3.17%
1450.00	b	9.6191E+16 $\pm$ 7.68%	1.2051E+17 $\pm$ 7.08%	2.7262E+17 $\pm$ 5.96%	1.7436E+16 $\pm$ 22.73%	5.1407E+17 $\pm$ 4.18%
1650.00	8.2274E+15 $\pm$ 27.61%	2.1953E+16 $\pm$ 23.05%	2.9212E+16 $\pm$ 12.13%	1.2356E+17 $\pm$ 9.27%	9.1127E+15 $\pm$ 20.81%	1.9207E+17 $\pm$ 7.24%
1850.00	b	b	1.7845E+16 $\pm$ 19.34%	5.4539E+16 $\pm$ 11.29%	6.2377E+15 $\pm$ 29.76%	9.7104E+16 $\pm$ 11.27%
2115.95	b	2.7836E+15 $\pm$ 28.19%	8.7569E+15 $\pm$ 19.79%	2.3803E+16 $\pm$ 10.91%	b	3.8190E+16 $\pm$ 9.67%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-59. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-1 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.5071E+17	± 4.22%	1.8424E+18	± 2.65%	2.8197E+18	± 1.88%	1.9287E+19	± 1.02%	1.0093E+18	± 3.47%	2.5509E+19	± 0.85%
78.70	6.7395E+17	± 3.19%	2.0584E+18	± 1.95%	2.7927E+18	± 1.37%	1.5824E+19	± 0.90%	6.0024E+17	± 2.94%	2.1950E+19	± 0.73%
153.70	6.1442E+17	± 2.58%	1.8360E+18	± 1.64%	2.3671E+18	± 1.14%	1.1553E+19	± 0.83%	3.8785E+17	± 2.65%	1.6759E+19	± 0.65%
253.70	5.2798E+17	± 2.84%	1.4128E+18	± 1.85%	1.7586E+18	± 1.23%	7.5584E+18	± 0.99%	2.3312E+17	± 3.06%	1.1491E+19	± 0.76%
353.70	4.1910E+17	± 3.16%	1.0762E+18	± 2.01%	1.3452E+18	± 1.38%	4.9224E+18	± 1.18%	1.5655E+17	± 3.90%	7.9194E+18	± 0.88%
453.70	3.2533E+17	± 3.52%	8.8344E+17	± 2.28%	9.9472E+17	± 1.54%	3.4384E+18	± 1.40%	1.1215E+17	± 4.77%	5.7541E+18	± 1.02%
553.70	2.5048E+17	± 4.16%	6.3898E+17	± 2.65%	7.4819E+17	± 1.60%	2.4750E+18	± 1.60%	7.6123E+16	± 6.26%	4.1888E+18	± 1.16%
653.70	2.0445E+17	± 4.50%	5.1662E+17	± 2.99%	5.6217E+17	± 1.74%	1.8331E+18	± 1.86%	5.9344E+16	± 6.13%	3.1757E+18	± 1.33%
753.70	1.5743E+17	± 5.38%	3.9254E+17	± 3.25%	4.3366E+17	± 1.96%	1.3222E+18	± 2.11%	4.6158E+16	± 10.30%	2.3520E+18	± 1.49%
872.70	1.2239E+17	± 5.24%	3.0971E+17	± 3.31%	3.2541E+17	± 2.33%	9.3226E+17	± 2.22%	2.8689E+16	± 6.00%	1.7185E+18	± 1.57%
1010.70	8.7250E+16	± 6.01%	1.9434E+17	± 4.35%	2.1880E+17	± 2.13%	6.4765E+17	± 2.73%	2.0092E+16	± 8.41%	1.1681E+18	± 1.90%
1148.70	5.7281E+16	± 7.55%	1.3623E+17	± 5.64%	1.5912E+17	± 3.00%	4.5102E+17	± 3.16%	1.2319E+16	± 9.26%	8.1597E+17	± 2.31%
1286.70	3.9458E+16	± 8.36%	9.0554E+16	± 6.10%	1.0034E+17	± 3.30%	3.0896E+17	± 4.22%	8.8405E+15	± 10.72%	5.4816E+17	± 2.88%
1426.85	1.8680E+16	± 10.71%	4.4001E+16	± 6.94%	6.3053E+16	± 3.82%	1.5903E+17	± 3.59%	3.0409E+15	± 10.40%	2.8780E+17	± 2.74%

Table E-60. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-1 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	5.0320E+17	± 3.71%	1.8882E+18	± 2.28%	2.8730E+18	± 1.73%	2.1029E+19	± 0.83%	1.6853E+18	± 2.30%	2.7979E+19	± 0.70%
78.70	5.9335E+17	± 3.99%	1.7443E+18	± 2.46%	2.6037E+18	± 1.87%	1.6407E+19	± 1.04%	1.1575E+18	± 3.00%	2.2506E+19	± 0.85%
153.70	5.5415E+17	± 3.06%	1.6158E+18	± 1.91%	2.1184E+18	± 1.46%	1.1882E+19	± 0.94%	7.5642E+17	± 2.61%	1.6926E+19	± 0.74%
253.70	4.3431E+17	± 3.16%	1.2268E+18	± 2.21%	1.5461E+18	± 1.75%	7.4337E+18	± 1.07%	4.6891E+17	± 3.12%	1.1110E+19	± 0.85%
353.70	3.4707E+17	± 3.61%	9.5858E+17	± 2.38%	1.1303E+18	± 1.64%	4.8789E+18	± 1.31%	2.9320E+17	± 3.83%	7.6080E+18	± 0.99%
453.70	2.5621E+17	± 4.34%	7.1502E+17	± 2.65%	8.7721E+17	± 1.85%	3.3190E+18	± 1.52%	1.9613E+17	± 4.64%	5.3636E+18	± 1.13%
553.70	2.2629E+17	± 5.19%	5.5300E+17	± 3.05%	6.4711E+17	± 2.03%	2.3614E+18	± 1.65%	1.3437E+17	± 4.95%	3.9222E+18	± 1.24%
653.70	1.7333E+17	± 5.06%	4.3742E+17	± 3.74%	4.6905E+17	± 2.05%	1.7936E+18	± 1.88%	1.0950E+17	± 6.21%	2.9829E+18	± 1.41%
753.70	1.2915E+17	± 6.06%	3.4601E+17	± 4.61%	3.8238E+17	± 3.34%	1.2750E+18	± 2.36%	7.8384E+16	± 6.16%	2.2110E+18	± 1.77%
872.70	1.0847E+17	± 5.75%	2.4949E+17	± 3.66%	2.7366E+17	± 2.58%	8.9441E+17	± 2.37%	5.2739E+16	± 6.12%	1.5788E+18	± 1.67%
1010.70	7.7822E+16	± 6.58%	1.7052E+17	± 5.05%	1.8692E+17	± 3.70%	6.2571E+17	± 3.19%	3.7022E+16	± 7.85%	1.0980E+18	± 2.22%
1148.70	4.5615E+16	± 9.46%	1.0955E+17	± 5.43%	1.2985E+17	± 3.95%	4.2011E+17	± 3.43%	2.3656E+16	± 8.11%	7.2879E+17	± 2.47%
1286.70	3.7725E+16	± 11.93%	8.1874E+16	± 6.95%	8.9031E+16	± 5.63%	2.9823E+17	± 4.45%	1.7373E+16	± 14.97%	5.2423E+17	± 3.21%
1426.85	1.3961E+16	± 9.70%	3.8914E+16	± 7.07%	6.1162E+16	± 5.01%	1.5647E+17	± 3.81%	5.4779E+15	± 12.48%	2.7599E+17	± 2.89%

Table E-61. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-2 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.7922E+17	± 4.27%	2.0122E+18	± 2.58%	2.8535E+18	± 1.86%	1.9173E+19	± 1.01%	1.0541E+18	± 4.07%	2.5672E+19	± 0.85%
78.70	7.0535E+17	± 3.05%	2.1063E+18	± 1.98%	2.9225E+18	± 1.43%	1.5758E+19	± 0.89%	6.0538E+17	± 3.20%	2.2097E+19	± 0.73%
153.70	6.3966E+17	± 2.50%	1.8337E+18	± 1.58%	2.4205E+18	± 1.10%	1.1777E+19	± 0.81%	3.7108E+17	± 2.75%	1.7042E+19	± 0.64%
253.70	5.7006E+17	± 2.64%	1.5043E+18	± 1.77%	1.8665E+18	± 1.17%	7.8601E+18	± 0.96%	2.2599E+17	± 3.25%	1.2027E+19	± 0.73%
353.70	4.5382E+17	± 3.01%	1.1610E+18	± 1.95%	1.4033E+18	± 1.32%	5.2778E+18	± 1.15%	1.6174E+17	± 3.85%	8.4576E+18	± 0.85%
453.70	3.6122E+17	± 3.36%	8.9049E+17	± 2.25%	1.0309E+18	± 1.41%	3.6140E+18	± 1.39%	1.1463E+17	± 4.55%	6.0112E+18	± 1.01%
553.70	2.9103E+17	± 3.72%	6.9796E+17	± 2.44%	8.1265E+17	± 1.61%	2.5143E+18	± 1.61%	7.9690E+16	± 4.94%	4.3956E+18	± 1.13%
653.70	2.2047E+17	± 4.28%	5.0345E+17	± 2.85%	6.0242E+17	± 1.64%	1.7108E+18	± 1.87%	5.2895E+16	± 5.87%	3.0900E+18	± 1.29%
753.70	1.6956E+17	± 4.83%	4.0423E+17	± 3.30%	4.6598E+17	± 1.97%	1.1999E+18	± 2.08%	4.2217E+16	± 6.39%	2.2818E+18	± 1.46%
872.70	1.2158E+17	± 5.01%	3.0100E+17	± 3.39%	3.4511E+17	± 2.15%	8.5956E+17	± 2.31%	2.7265E+16	± 7.13%	1.6545E+18	± 1.58%
1010.70	8.2430E+16	± 6.22%	1.9902E+17	± 4.03%	2.4661E+17	± 2.55%	5.7953E+17	± 2.66%	2.1072E+16	± 8.47%	1.1287E+18	± 1.84%
1148.70	6.9402E+16	± 6.91%	1.4388E+17	± 4.68%	1.5603E+17	± 2.47%	3.9401E+17	± 3.27%	1.3004E+16	± 10.33%	7.7632E+17	± 2.20%
1286.70	4.3678E+16	± 8.99%	1.0803E+17	± 5.99%	1.2068E+17	± 3.50%	2.7686E+17	± 3.91%	7.2859E+15	± 9.65%	5.5653E+17	± 2.66%
1426.85	2.2908E+16	± 8.66%	4.2382E+16	± 6.34%	7.2032E+16	± 3.69%	1.4495E+17	± 3.49%	3.6540E+15	± 12.94%	2.8592E+17	± 2.56%

Table E-62. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-2 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	5.5148E+17	± 3.48%	1.9075E+18	± 2.25%	2.9320E+18	± 1.67%	2.1358E+19	± 0.84%	1.6924E+18	± 2.27%	2.8441E+19	± 0.71%
78.70	5.9756E+17	± 3.83%	1.8748E+18	± 2.38%	2.6098E+18	± 1.78%	1.6419E+19	± 1.01%	1.1057E+18	± 3.03%	2.2607E+19	± 0.83%
153.70	5.6398E+17	± 2.98%	1.6668E+18	± 1.90%	2.1859E+18	± 1.39%	1.2021E+19	± 0.90%	6.8916E+17	± 2.71%	1.7126E+19	± 0.72%
253.70	4.7512E+17	± 3.00%	1.2861E+18	± 2.03%	1.6620E+18	± 1.63%	7.8396E+18	± 1.08%	4.4562E+17	± 3.13%	1.1708E+19	± 0.84%
353.70	3.7372E+17	± 3.63%	9.7965E+17	± 2.25%	1.2656E+18	± 1.96%	5.2914E+18	± 1.29%	3.2112E+17	± 3.85%	8.2314E+18	± 0.98%
453.70	3.1198E+17	± 3.95%	7.6001E+17	± 2.63%	8.9648E+17	± 1.76%	3.4786E+18	± 1.47%	2.2293E+17	± 4.55%	5.6701E+18	± 1.09%
553.70	2.4106E+17	± 4.43%	6.0887E+17	± 3.31%	6.7597E+17	± 2.30%	2.4198E+18	± 1.80%	1.4990E+17	± 5.27%	4.0956E+18	± 1.32%
653.70	1.8482E+17	± 5.17%	4.3243E+17	± 3.70%	5.2695E+17	± 3.08%	1.6455E+18	± 1.99%	9.1481E+16	± 5.49%	2.8812E+18	± 1.51%
753.70	1.5234E+17	± 5.58%	3.2226E+17	± 3.80%	3.8550E+17	± 2.44%	1.1340E+18	± 2.38%	6.4435E+16	± 6.49%	2.0585E+18	± 1.65%
872.70	1.0924E+17	± 6.15%	2.2943E+17	± 3.70%	2.7876E+17	± 2.45%	8.2899E+17	± 2.55%	5.0593E+16	± 9.18%	1.4970E+18	± 1.77%
1010.70	6.1909E+16	± 6.67%	1.7108E+17	± 4.74%	1.9298E+17	± 2.83%	5.5203E+17	± 3.12%	3.3703E+16	± 7.86%	1.0117E+18	± 2.12%
1148.70	5.8116E+16	± 8.26%	1.2089E+17	± 5.57%	1.2817E+17	± 2.87%	3.7988E+17	± 3.79%	1.7613E+16	± 9.83%	7.0467E+17	± 2.53%
1286.70	3.4170E+16	± 9.95%	7.2526E+16	± 6.96%	9.9230E+16	± 4.16%	2.6610E+17	± 4.14%	1.5728E+16	± 11.69%	4.8776E+17	± 2.88%
1426.85	1.9841E+16	± 9.53%	3.9370E+16	± 8.18%	6.4041E+16	± 3.84%	1.4198E+17	± 3.81%	5.3349E+15	± 11.91%	2.7057E+17	± 2.89%

Table E-63. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-3 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.4073E+17	± 4.25%	1.9270E+18	± 2.69%	2.9038E+18	± 1.93%	1.9742E+19	± 1.05%	1.0792E+18	± 3.53%	2.6193E+19	± 0.88%
78.70	6.5174E+17	± 3.20%	2.1018E+18	± 1.94%	2.8908E+18	± 1.41%	1.6048E+19	± 0.92%	6.0412E+17	± 3.02%	2.2296E+19	± 0.75%
153.70	6.2111E+17	± 2.53%	1.8901E+18	± 1.57%	2.4437E+18	± 1.09%	1.1748E+19	± 0.82%	3.8292E+17	± 2.76%	1.7085E+19	± 0.65%
253.70	5.2532E+17	± 2.77%	1.4950E+18	± 1.76%	1.8579E+18	± 1.22%	7.6438E+18	± 0.98%	2.5912E+17	± 3.40%	1.1781E+19	± 0.75%
353.70	4.2681E+17	± 3.03%	1.1789E+18	± 1.95%	1.4010E+18	± 1.37%	5.1065E+18	± 1.16%	1.5992E+17	± 3.65%	8.2732E+18	± 0.85%
453.70	3.5071E+17	± 3.45%	9.1356E+17	± 2.20%	1.0488E+18	± 1.45%	3.5854E+18	± 1.39%	1.1640E+17	± 4.65%	6.0149E+18	± 1.01%
553.70	2.7910E+17	± 3.85%	7.2430E+17	± 2.52%	7.9572E+17	± 1.56%	2.4321E+18	± 1.61%	7.3857E+16	± 5.06%	4.3051E+18	± 1.14%
653.70	2.2975E+17	± 4.36%	5.2840E+17	± 2.81%	6.0718E+17	± 1.77%	1.7191E+18	± 1.88%	5.6044E+16	± 6.43%	3.1405E+18	± 1.30%
753.70	1.7145E+17	± 5.00%	4.1347E+17	± 3.29%	4.6258E+17	± 2.03%	1.1974E+18	± 2.10%	3.8358E+16	± 6.43%	2.2832E+18	± 1.47%
872.70	1.3755E+17	± 5.01%	2.9601E+17	± 3.36%	3.4452E+17	± 1.93%	8.5124E+17	± 2.29%	2.8190E+16	± 6.79%	1.6575E+18	± 1.55%
1010.70	8.7539E+16	± 6.53%	2.1501E+17	± 4.12%	2.4837E+17	± 2.43%	5.5871E+17	± 2.79%	1.7356E+16	± 7.04%	1.1270E+18	± 1.89%
1148.70	5.8715E+16	± 7.45%	1.5132E+17	± 4.66%	1.6889E+17	± 2.71%	3.7385E+17	± 3.17%	1.1478E+16	± 8.25%	7.6425E+17	± 2.14%
1286.70	4.1856E+16	± 9.19%	1.0332E+17	± 5.76%	1.2408E+17	± 3.58%	2.6846E+17	± 3.47%	8.0874E+15	± 11.19%	5.4581E+17	± 2.49%
1426.85	1.8162E+16	± 8.89%	4.8435E+16	± 6.09%	6.5711E+16	± 3.65%	1.4818E+17	± 3.71%	3.5570E+15	± 17.90%	2.8405E+17	± 2.63%

Table E-64. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-3 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	5.0994E+17	± 3.74%	1.8644E+18	± 2.32%	2.8840E+18	± 1.70%	2.1145E+19	± 0.82%	1.6930E+18	± 2.22%	2.8096E+19	± 0.70%
78.70	5.9981E+17	± 4.18%	1.8344E+18	± 2.45%	2.6362E+18	± 1.81%	1.6441E+19	± 1.05%	1.1374E+18	± 2.97%	2.2649E+19	± 0.85%
153.70	5.3761E+17	± 2.93%	1.6541E+18	± 1.92%	2.1755E+18	± 1.46%	1.2023E+19	± 0.90%	7.5913E+17	± 2.70%	1.7149E+19	± 0.72%
253.70	4.4592E+17	± 3.04%	1.2908E+18	± 2.03%	1.6654E+18	± 1.60%	7.8178E+18	± 1.07%	4.6219E+17	± 3.28%	1.1682E+19	± 0.84%
353.70	3.7922E+17	± 3.60%	9.8897E+17	± 2.24%	1.2140E+18	± 1.74%	5.0923E+18	± 1.26%	3.2564E+17	± 4.28%	8.0001E+18	± 0.95%
453.70	2.8748E+17	± 3.92%	7.4891E+17	± 2.52%	9.0395E+17	± 1.65%	3.4943E+18	± 1.50%	2.2797E+17	± 4.40%	5.6626E+18	± 1.10%
553.70	2.3668E+17	± 4.23%	5.9432E+17	± 3.13%	6.7515E+17	± 2.03%	2.3785E+18	± 1.86%	1.3209E+17	± 4.79%	4.0168E+18	± 1.32%
653.70	1.6947E+17	± 4.59%	4.4288E+17	± 3.77%	5.1488E+17	± 2.69%	1.6362E+18	± 2.00%	1.0327E+17	± 5.52%	2.8667E+18	± 1.46%
753.70	1.4761E+17	± 6.81%	3.5297E+17	± 4.04%	3.7966E+17	± 2.57%	1.1438E+18	± 2.34%	7.3183E+16	± 7.27%	2.0973E+18	± 1.70%
872.70	1.0539E+17	± 5.78%	2.3633E+17	± 4.22%	2.9974E+17	± 3.19%	8.1303E+17	± 2.50%	5.2299E+16	± 7.30%	1.5068E+18	± 1.79%
1010.70	6.6205E+16	± 6.61%	1.7085E+17	± 5.10%	2.0230E+17	± 2.68%	5.2794E+17	± 2.89%	2.9148E+16	± 7.68%	9.9644E+17	± 2.01%
1148.70	5.0109E+16	± 9.59%	1.2912E+17	± 6.31%	1.4344E+17	± 3.21%	3.6011E+17	± 3.46%	2.2906E+16	± 10.91%	7.0568E+17	± 2.48%
1286.70	4.3714E+16	± 12.22%	8.2263E+16	± 6.61%	9.7439E+16	± 3.86%	2.5236E+17	± 3.76%	1.5292E+16	± 12.63%	4.9107E+17	± 2.77%
1426.85	1.8052E+16	± 10.67%	3.8019E+16	± 6.34%	6.5282E+16	± 4.52%	1.5547E+17	± 3.96%	6.3825E+15	± 13.46%	2.8321E+17	± 2.89%

Table E-65. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-6 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.7938E+17	± 4.30%	1.9181E+18	± 2.60%	2.8327E+18	± 1.87%	1.9184E+19	± 1.05%	1.0525E+18	± 3.55%	2.5567E+19	± 0.88%
78.70	6.8767E+17	± 3.12%	2.0272E+18	± 1.88%	2.7858E+18	± 1.38%	1.5797E+19	± 0.92%	5.9620E+17	± 3.08%	2.1894E+19	± 0.74%
153.70	6.2258E+17	± 2.48%	1.8547E+18	± 1.57%	2.4255E+18	± 1.11%	1.1499E+19	± 0.81%	3.9761E+17	± 2.79%	1.6799E+19	± 0.64%
253.70	5.2884E+17	± 2.75%	1.4945E+18	± 1.75%	1.7967E+18	± 1.14%	7.8274E+18	± 0.98%	2.5326E+17	± 3.31%	1.1901E+19	± 0.75%
353.70	4.4331E+17	± 2.99%	1.1544E+18	± 1.97%	1.3746E+18	± 1.27%	5.1826E+18	± 1.16%	1.7712E+17	± 4.06%	8.3320E+18	± 0.86%
453.70	3.4274E+17	± 3.38%	8.9456E+17	± 2.19%	1.0575E+18	± 1.45%	3.5208E+18	± 1.37%	1.1514E+17	± 4.53%	5.9307E+18	± 1.00%
553.70	3.0256E+17	± 3.71%	7.0087E+17	± 2.49%	7.9191E+17	± 1.56%	2.4535E+18	± 1.61%	9.4287E+16	± 6.78%	4.3432E+18	± 1.14%
653.70	2.0972E+17	± 4.50%	5.3100E+17	± 2.83%	6.0529E+17	± 1.81%	1.7908E+18	± 1.85%	5.9472E+16	± 6.64%	3.1963E+18	± 1.30%
753.70	1.6347E+17	± 4.96%	4.0834E+17	± 3.38%	4.6851E+17	± 1.79%	1.2674E+18	± 2.04%	3.8525E+16	± 6.88%	2.3463E+18	± 1.44%
872.70	1.2706E+17	± 5.08%	3.0008E+17	± 3.29%	3.4664E+17	± 1.89%	9.1524E+17	± 2.27%	2.8068E+16	± 6.06%	1.7171E+18	± 1.55%
1010.70	9.0711E+16	± 6.16%	2.0635E+17	± 3.97%	2.3062E+17	± 2.23%	5.8892E+17	± 2.57%	1.7976E+16	± 6.96%	1.1346E+18	± 1.78%
1148.70	7.2346E+16	± 7.76%	1.5374E+17	± 4.89%	1.6294E+17	± 2.76%	4.1638E+17	± 3.04%	1.2185E+16	± 8.96%	8.1760E+17	± 2.22%
1286.70	3.2378E+16	± 8.83%	1.0137E+17	± 5.84%	1.0977E+17	± 3.19%	2.7967E+17	± 3.78%	8.6275E+15	± 10.43%	5.3182E+17	± 2.63%
1426.85	1.6955E+16	± 9.94%	4.3684E+16	± 6.19%	6.4626E+16	± 3.87%	1.4467E+17	± 3.72%	3.6291E+15	± 11.54%	2.7357E+17	± 2.72%

Table E-66. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-6 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	4.8573E+17	± 3.52%	1.8144E+18	± 2.15%	2.7792E+18	± 1.54%	2.1294E+19	± 0.83%	1.6637E+18	± 2.25%	2.8037E+19	± 0.70%
78.70	5.7125E+17	± 3.93%	1.7988E+18	± 2.27%	2.4779E+18	± 1.67%	1.6365E+19	± 1.04%	1.0986E+18	± 2.83%	2.2311E+19	± 0.84%
153.70	5.3571E+17	± 2.95%	1.6126E+18	± 1.85%	2.1758E+18	± 1.31%	1.1871E+19	± 0.91%	7.2961E+17	± 2.65%	1.6925E+19	± 0.72%
253.70	4.6139E+17	± 3.14%	1.2961E+18	± 2.13%	1.6211E+18	± 1.60%	7.9262E+18	± 1.08%	4.8366E+17	± 3.27%	1.1788E+19	± 0.84%
353.70	3.9171E+17	± 3.50%	1.0009E+18	± 2.39%	1.2028E+18	± 1.64%	5.1754E+18	± 1.26%	3.1699E+17	± 3.83%	8.0878E+18	± 0.95%
453.70	2.9256E+17	± 3.93%	7.6733E+17	± 2.70%	8.8239E+17	± 1.83%	3.4719E+18	± 1.58%	2.0482E+17	± 4.28%	5.6190E+18	± 1.15%
553.70	2.6114E+17	± 4.60%	5.8772E+17	± 2.93%	6.9096E+17	± 2.05%	2.4446E+18	± 1.73%	1.5640E+17	± 5.97%	4.1408E+18	± 1.28%
653.70	1.8508E+17	± 5.48%	4.5852E+17	± 3.51%	5.0576E+17	± 2.03%	1.7438E+18	± 2.02%	9.5742E+16	± 5.40%	2.9889E+18	± 1.45%
753.70	1.4584E+17	± 5.48%	3.5241E+17	± 4.12%	3.8445E+17	± 2.29%	1.2566E+18	± 2.43%	6.3742E+16	± 6.17%	2.2030E+18	± 1.70%
872.70	1.0993E+17	± 5.73%	2.5843E+17	± 4.22%	3.0375E+17	± 2.60%	8.8085E+17	± 2.43%	4.7910E+16	± 6.23%	1.6009E+18	± 1.73%
1010.70	7.4986E+16	± 6.42%	1.6618E+17	± 4.87%	2.0807E+17	± 3.61%	5.5894E+17	± 2.88%	3.4101E+16	± 7.69%	1.0423E+18	± 2.07%
1148.70	4.7205E+16	± 7.59%	1.1945E+17	± 5.75%	1.3053E+17	± 3.41%	4.1346E+17	± 3.34%	2.0298E+16	± 8.17%	7.3095E+17	± 2.38%
1286.70	3.4194E+16	± 11.25%	7.9325E+16	± 6.43%	9.3589E+16	± 4.10%	2.7222E+17	± 4.12%	1.2263E+16	± 8.92%	4.9159E+17	± 2.89%
1426.85	1.4297E+16	± 11.18%	3.5739E+16	± 6.64%	5.7811E+16	± 4.30%	1.5454E+17	± 4.00%	6.0572E+15	± 10.94%	2.6845E+17	± 2.97%

Table E-67. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-7 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.7341E+17	± 4.34%	1.9460E+18	± 2.62%	2.9277E+18	± 1.85%	1.9346E+19	± 1.05%	1.0165E+18	± 3.58%	2.5810E+19	± 0.87%
78.70	6.9629E+17	± 3.04%	2.1002E+18	± 1.88%	2.9224E+18	± 1.40%	1.6081E+19	± 0.91%	5.9698E+17	± 3.24%	2.2397E+19	± 0.74%
153.70	6.6242E+17	± 2.46%	1.8573E+18	± 1.56%	2.4504E+18	± 1.08%	1.1708E+19	± 0.81%	4.0307E+17	± 2.76%	1.7081E+19	± 0.64%
253.70	5.4519E+17	± 2.74%	1.4571E+18	± 1.75%	1.8473E+18	± 1.23%	7.9031E+18	± 0.99%	2.5400E+17	± 3.14%	1.2007E+19	± 0.76%
353.70	4.2769E+17	± 3.03%	1.1280E+18	± 1.98%	1.3818E+18	± 1.33%	5.3087E+18	± 1.14%	1.7514E+17	± 3.78%	8.4213E+18	± 0.85%
453.70	3.5475E+17	± 3.38%	8.7269E+17	± 2.21%	1.0517E+18	± 1.53%	3.6106E+18	± 1.34%	1.1598E+17	± 4.80%	6.0057E+18	± 0.99%
553.70	2.6932E+17	± 3.72%	6.7768E+17	± 2.51%	8.0050E+17	± 1.55%	2.5887E+18	± 1.56%	8.1336E+16	± 5.76%	4.4175E+18	± 1.13%
653.70	2.3413E+17	± 4.18%	5.1315E+17	± 2.92%	6.2400E+17	± 1.91%	1.8220E+18	± 1.82%	5.7536E+16	± 5.82%	3.2508E+18	± 1.29%
753.70	1.7920E+17	± 4.73%	4.1223E+17	± 3.21%	4.6343E+17	± 1.80%	1.3102E+18	± 2.02%	4.0216E+16	± 6.45%	2.4053E+18	± 1.42%
872.70	1.3065E+17	± 5.08%	2.9426E+17	± 3.33%	3.4789E+17	± 2.08%	9.1704E+17	± 2.12%	3.1558E+16	± 6.35%	1.7214E+18	± 1.50%
1010.70	8.7855E+16	± 6.22%	2.3195E+17	± 4.16%	2.3861E+17	± 2.32%	5.8459E+17	± 2.61%	1.8706E+16	± 8.04%	1.1617E+18	± 1.85%
1148.70	5.7292E+16	± 7.91%	1.4776E+17	± 4.96%	1.6071E+17	± 2.97%	4.1397E+17	± 3.14%	1.4898E+16	± 11.48%	7.9463E+17	± 2.29%
1286.70	4.0512E+16	± 9.18%	9.7129E+16	± 6.34%	1.1431E+17	± 3.72%	2.8267E+17	± 3.86%	8.3889E+15	± 9.33%	5.4301E+17	± 2.70%
1426.85	1.4300E+16	± 11.46%	4.6649E+16	± 6.80%	6.2855E+16	± 3.80%	1.4789E+17	± 3.49%	2.7206E+15	± 10.45%	2.7442E+17	± 2.69%

Table E-68. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-7 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	5.3562E+17	± 3.59%	1.9329E+18	± 2.34%	2.9057E+18	± 1.58%	2.0964E+19	± 0.82%	1.6259E+18	± 2.25%	2.7964E+19	± 0.69%
78.70	5.7266E+17	± 3.63%	1.8683E+18	± 2.47%	2.6250E+18	± 1.76%	1.6605E+19	± 1.01%	1.0649E+18	± 3.30%	2.2736E+19	± 0.84%
153.70	5.6383E+17	± 3.01%	1.5995E+18	± 1.84%	2.2292E+18	± 1.39%	1.1976E+19	± 0.90%	7.7779E+17	± 2.51%	1.7146E+19	± 0.72%
253.70	4.9012E+17	± 3.25%	1.2801E+18	± 2.09%	1.6226E+18	± 1.44%	7.9481E+18	± 1.06%	4.7817E+17	± 3.11%	1.1819E+19	± 0.82%
353.70	3.6987E+17	± 3.57%	9.7808E+17	± 2.38%	1.2079E+18	± 1.96%	5.3790E+18	± 1.27%	3.3032E+17	± 4.05%	8.2651E+18	± 0.98%
453.70	2.8967E+17	± 4.09%	7.5262E+17	± 2.58%	9.2541E+17	± 1.86%	3.5100E+18	± 1.50%	2.0635E+17	± 4.29%	5.6841E+18	± 1.11%
553.70	2.4782E+17	± 4.41%	5.8024E+17	± 3.04%	6.8843E+17	± 1.85%	2.4938E+18	± 1.68%	1.4656E+17	± 5.51%	4.1568E+18	± 1.25%
653.70	1.9904E+17	± 4.84%	4.3235E+17	± 3.30%	5.1368E+17	± 2.34%	1.7616E+18	± 2.01%	1.1227E+17	± 6.54%	3.0189E+18	± 1.44%
753.70	1.5415E+17	± 5.94%	3.3857E+17	± 3.72%	3.9888E+17	± 2.97%	1.2935E+18	± 2.27%	7.7583E+16	± 6.82%	2.2626E+18	± 1.66%
872.70	1.0134E+17	± 5.77%	2.4928E+17	± 3.87%	2.7055E+17	± 2.00%	8.8589E+17	± 2.31%	5.0959E+16	± 6.38%	1.5580E+18	± 1.63%
1010.70	7.3434E+16	± 7.05%	1.7172E+17	± 4.23%	2.0202E+17	± 3.94%	5.6538E+17	± 3.08%	3.1675E+16	± 8.18%	1.0442E+18	± 2.14%
1148.70	4.3042E+16	± 9.28%	1.1167E+17	± 5.99%	1.3685E+17	± 4.26%	3.7388E+17	± 3.44%	2.1291E+16	± 8.71%	6.8672E+17	± 2.50%
1286.70	2.9124E+16	± 9.89%	7.6729E+16	± 7.12%	9.4448E+16	± 4.14%	2.5795E+17	± 3.82%	1.3958E+16	± 15.15%	4.7221E+17	± 2.78%
1426.85	1.1012E+16	± 10.52%	3.9299E+16	± 7.52%	5.9355E+16	± 4.23%	1.4227E+17	± 3.79%	5.4864E+15	± 10.17%	2.5742E+17	± 2.81%

Table E-69. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-8 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
26.85	5.5703E+17	± 4.50%	1.9106E+18	± 2.60%	2.9489E+18	± 1.88%	1.9436E+19	± 1.07%	1.0661E+18	± 3.62%	2.5919E+19	± 0.89%
78.70	7.0021E+17	± 3.07%	2.1035E+18	± 1.90%	2.9219E+18	± 1.37%	1.5915E+19	± 0.92%	5.8802E+17	± 3.06%	2.2229E+19	± 0.74%
153.70	6.7642E+17	± 2.48%	1.9450E+18	± 1.56%	2.4468E+18	± 1.09%	1.1890E+19	± 0.82%	4.1434E+17	± 2.86%	1.7373E+19	± 0.65%
253.70	5.9191E+17	± 2.63%	1.4998E+18	± 1.75%	1.8879E+18	± 1.14%	7.9085E+18	± 0.97%	2.3960E+17	± 3.36%	1.2128E+19	± 0.74%
353.70	4.4087E+17	± 2.99%	1.2003E+18	± 1.99%	1.4258E+18	± 1.29%	5.4554E+18	± 1.15%	1.7301E+17	± 4.19%	8.6953E+18	± 0.86%
453.70	3.5873E+17	± 3.42%	9.2237E+17	± 2.19%	1.0852E+18	± 1.46%	3.8057E+18	± 1.36%	1.0766E+17	± 4.16%	6.2797E+18	± 0.99%
553.70	2.9272E+17	± 3.74%	6.9441E+17	± 2.49%	8.3562E+17	± 1.52%	2.6410E+18	± 1.58%	7.8056E+16	± 4.88%	4.5419E+18	± 1.13%
653.70	2.1334E+17	± 4.35%	5.7795E+17	± 2.87%	6.3220E+17	± 1.74%	1.9258E+18	± 1.85%	5.8607E+16	± 5.71%	3.4079E+18	± 1.30%
753.70	1.7655E+17	± 4.86%	4.3060E+17	± 3.23%	4.7277E+17	± 1.91%	1.3185E+18	± 2.11%	4.5565E+16	± 7.69%	2.4440E+18	± 1.46%
872.70	1.2871E+17	± 4.90%	3.3266E+17	± 3.42%	3.6083E+17	± 1.97%	9.0732E+17	± 2.19%	2.5502E+16	± 5.50%	1.7550E+18	± 1.53%
1010.70	8.5481E+16	± 6.06%	2.2718E+17	± 4.14%	2.4795E+17	± 2.13%	6.2635E+17	± 2.80%	2.0536E+16	± 8.30%	1.2075E+18	± 1.92%
1148.70	6.8090E+16	± 7.08%	1.5538E+17	± 4.48%	1.6785E+17	± 2.72%	4.0880E+17	± 3.11%	1.3836E+16	± 11.07%	8.1396E+17	± 2.11%
1286.70	4.7423E+16	± 8.69%	9.3864E+16	± 5.90%	1.1409E+17	± 3.38%	2.8759E+17	± 3.55%	8.4009E+15	± 10.04%	5.5136E+17	± 2.51%
1426.85	1.9659E+16	± 9.02%	4.7304E+16	± 6.31%	7.5049E+16	± 3.78%	1.6285E+17	± 3.51%	3.7885E+15	± 11.85%	3.0865E+17	± 2.59%

Table E-70. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Beam Tube HB-8 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
18.70	5.1550E+17	± 3.83%	1.7971E+18	± 2.15%	2.8103E+18	± 1.60%	2.0982E+19	± 0.82%	1.6970E+18	± 2.25%	2.7802E+19	± 0.70%
78.70	6.1884E+17	± 3.72%	1.8048E+18	± 2.21%	2.6272E+18	± 1.64%	1.6659E+19	± 1.01%	1.1246E+18	± 3.07%	2.2835E+19	± 0.82%
153.70	5.9715E+17	± 2.83%	1.6570E+18	± 1.88%	2.2070E+18	± 1.35%	1.2012E+19	± 0.91%	7.1295E+17	± 2.66%	1.7186E+19	± 0.72%
253.70	4.9576E+17	± 3.02%	1.3325E+18	± 2.04%	1.6847E+18	± 1.59%	7.8783E+18	± 1.03%	4.8192E+17	± 3.30%	1.1873E+19	± 0.81%
353.70	3.7256E+17	± 3.43%	1.0249E+18	± 2.22%	1.2440E+18	± 1.85%	5.4080E+18	± 1.27%	3.2127E+17	± 3.76%	8.3708E+18	± 0.96%
453.70	3.0519E+17	± 4.21%	8.0004E+17	± 2.73%	9.4778E+17	± 1.67%	3.8071E+18	± 1.56%	2.1395E+17	± 4.75%	6.0740E+18	± 1.15%
553.70	2.4665E+17	± 4.29%	6.2685E+17	± 3.17%	6.9606E+17	± 2.10%	2.6125E+18	± 1.82%	1.5188E+17	± 4.57%	4.3339E+18	± 1.31%
653.70	1.8316E+17	± 5.42%	4.7780E+17	± 3.30%	5.3924E+17	± 2.23%	1.8177E+18	± 1.97%	1.0400E+17	± 5.08%	3.1219E+18	± 1.42%
753.70	1.3899E+17	± 5.77%	3.5874E+17	± 3.84%	3.8454E+17	± 2.21%	1.3148E+18	± 2.39%	7.8109E+16	± 6.21%	2.2752E+18	± 1.66%
872.70	1.1256E+17	± 5.86%	2.8540E+17	± 4.06%	2.9823E+17	± 2.33%	8.5569E+17	± 2.34%	4.9146E+16	± 6.47%	1.6010E+18	± 1.68%
1010.70	7.1704E+16	± 6.46%	1.9589E+17	± 4.88%	1.9988E+17	± 2.55%	5.9507E+17	± 3.15%	3.4051E+16	± 7.81%	1.0966E+18	± 2.13%
1148.70	5.3408E+16	± 7.47%	1.3524E+17	± 5.33%	1.3540E+17	± 3.38%	3.9482E+17	± 3.82%	2.1227E+16	± 9.73%	7.4009E+17	± 2.55%
1286.70	4.0439E+16	± 13.49%	8.3172E+16	± 7.66%	9.9322E+16	± 5.93%	2.7754E+17	± 3.96%	1.4261E+16	± 13.40%	5.1473E+17	± 3.13%
1426.85	1.8240E+16	± 10.61%	4.0763E+16	± 6.50%	6.8318E+16	± 3.92%	1.5409E+17	± 3.56%	5.4231E+15	± 11.98%	2.8683E+17	± 2.65%

Table E-71. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-9 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
26.85	5.8168E+17	± 4.12%	1.9911E+18	± 2.64%	2.9669E+18	± 1.90%	1.9399E+19	± 1.07%	1.0342E+18	± 3.61%	2.5973E+19 ± 0.88%
78.70	7.0112E+17	± 3.05%	2.1627E+18	± 1.91%	3.0013E+18	± 1.42%	1.5974E+19	± 0.88%	5.9971E+17	± 3.05%	2.2439E+19 ± 0.72%
153.70	6.7284E+17	± 2.55%	1.8586E+18	± 1.60%	2.4323E+18	± 1.15%	1.1679E+19	± 0.82%	4.0096E+17	± 2.56%	1.7044E+19 ± 0.65%
253.70	5.2371E+17	± 2.75%	1.4883E+18	± 1.76%	1.8336E+18	± 1.19%	7.6810E+18	± 0.99%	2.6250E+17	± 3.15%	1.1789E+19 ± 0.75%
353.70	4.3039E+17	± 3.11%	1.1438E+18	± 2.01%	1.3578E+18	± 1.29%	4.9749E+18	± 1.19%	1.7691E+17	± 4.50%	8.0839E+18 ± 0.87%
453.70	3.4418E+17	± 3.46%	8.9633E+17	± 2.24%	1.0270E+18	± 1.36%	3.4554E+18	± 1.44%	1.2062E+17	± 4.95%	5.8435E+18 ± 1.02%
553.70	2.8696E+17	± 3.76%	6.7628E+17	± 2.58%	7.8945E+17	± 1.53%	2.4153E+18	± 1.70%	7.8397E+16	± 5.51%	4.2464E+18 ± 1.18%
653.70	2.1540E+17	± 4.39%	5.4707E+17	± 2.99%	6.0572E+17	± 1.80%	1.7093E+18	± 1.95%	5.1659E+16	± 5.72%	3.1291E+18 ± 1.35%
753.70	1.8496E+17	± 4.87%	4.0574E+17	± 3.27%	4.6142E+17	± 1.94%	1.2453E+18	± 2.05%	3.6813E+16	± 7.30%	2.3342E+18 ± 1.43%
872.70	1.2972E+17	± 5.36%	3.0267E+17	± 3.50%	3.3333E+17	± 1.80%	8.4944E+17	± 2.16%	2.8288E+16	± 7.42%	1.6434E+18 ± 1.52%
1010.70	9.8792E+16	± 6.04%	1.9735E+17	± 3.99%	2.4125E+17	± 2.27%	5.8585E+17	± 2.62%	2.0297E+16	± 7.43%	1.1435E+18 ± 1.81%
1148.70	6.7651E+16	± 7.20%	1.4247E+17	± 4.73%	1.7394E+17	± 2.87%	3.9195E+17	± 3.32%	1.2416E+16	± 8.10%	7.8842E+17 ± 2.22%
1286.70	3.9940E+16	± 9.07%	9.6304E+16	± 5.82%	1.1433E+17	± 3.04%	2.8824E+17	± 3.76%	6.7136E+15	± 10.26%	5.4553E+17 ± 2.61%
1426.85	1.9942E+16	± 9.32%	4.5732E+16	± 6.14%	6.8659E+16	± 3.39%	1.5698E+17	± 3.55%	2.9504E+15	± 11.02%	2.9427E+17 ± 2.60%

Table E-72. Five-group Photon Spectrum (m^2s^{-1}) in the Beam Tube HB-9 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
18.70	5.3337E+17	± 3.47%	1.8924E+18	± 2.18%	2.9393E+18	± 1.58%	2.1215E+19	± 0.85%	1.6496E+18	± 2.32%	2.8229E+19 ± 0.72%
78.70	6.2210E+17	± 3.72%	1.9065E+18	± 2.37%	2.7202E+18	± 1.79%	1.6638E+19	± 1.06%	1.0943E+18	± 3.17%	2.2982E+19 ± 0.86%
153.70	5.4635E+17	± 2.86%	1.6271E+18	± 1.93%	2.2010E+18	± 1.57%	1.2014E+19	± 0.88%	8.2781E+17	± 2.70%	1.7216E+19 ± 0.71%
253.70	4.3723E+17	± 3.29%	1.2724E+18	± 2.12%	1.6116E+18	± 1.58%	7.7647E+18	± 1.09%	5.3521E+17	± 3.06%	1.1621E+19 ± 0.85%
353.70	3.4663E+17	± 3.91%	9.4586E+17	± 2.34%	1.1762E+18	± 1.60%	4.9841E+18	± 1.39%	3.4058E+17	± 3.95%	7.7934E+18 ± 1.03%
453.70	2.9811E+17	± 4.41%	7.7374E+17	± 2.70%	8.7779E+17	± 1.69%	3.3210E+18	± 1.57%	2.0998E+17	± 4.45%	5.4806E+18 ± 1.15%
553.70	2.3910E+17	± 4.32%	5.8939E+17	± 3.16%	6.6430E+17	± 1.91%	2.3285E+18	± 1.84%	1.4711E+17	± 6.08%	3.9684E+18 ± 1.32%
653.70	1.7490E+17	± 4.99%	4.3334E+17	± 3.25%	5.2412E+17	± 2.53%	1.6003E+18	± 2.15%	1.0914E+17	± 6.10%	2.8418E+18 ± 1.51%
753.70	1.5384E+17	± 6.16%	3.1660E+17	± 3.62%	3.9204E+17	± 2.72%	1.1813E+18	± 2.55%	6.7816E+16	± 7.30%	2.1116E+18 ± 1.75%
872.70	1.0737E+17	± 5.95%	2.7161E+17	± 4.04%	2.6977E+17	± 1.93%	8.2379E+17	± 2.47%	4.9678E+16	± 6.96%	1.5222E+18 ± 1.72%
1010.70	8.4802E+16	± 6.96%	1.6565E+17	± 5.07%	1.9422E+17	± 2.52%	5.6018E+17	± 2.84%	3.2885E+16	± 11.57%	1.0377E+18 ± 2.02%
1148.70	5.6359E+16	± 9.24%	1.1636E+17	± 6.44%	1.4240E+17	± 3.24%	3.6863E+17	± 3.57%	2.0727E+16	± 10.22%	7.0449E+17 ± 2.52%
1286.70	3.4582E+16	± 10.31%	6.6009E+16	± 6.61%	9.3613E+16	± 3.42%	2.6437E+17	± 3.99%	1.6612E+16	± 14.47%	4.7518E+17 ± 2.81%
1426.85	1.4209E+16	± 9.47%	4.0342E+16	± 7.06%	6.2815E+16	± 4.03%	1.4833E+17	± 3.71%	5.2514E+15	± 12.64%	2.7094E+17 ± 2.72%

Table E-73. Five-group Photon Spectrum (m^2s^{-1}) in the Through Tube HB-5/HB-10 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
1721.75	1.2915E+16	±	13.86%	2.8781E+16	±	10.10%	6.0593E+16	±	4.91%	1.2319E+17	±	4.43%	3.6097E+15	±	16.68%	2.2908E+17	±	3.35%
1475.00	3.0816E+16	±	9.14%	7.0877E+16	±	5.41%	8.7763E+16	±	3.33%	2.1605E+17	±	3.29%	6.4464E+15	±	8.99%	4.1196E+17	±	2.37%
1225.00	5.4597E+16	±	6.36%	1.1853E+17	±	4.23%	1.2747E+17	±	2.16%	3.2698E+17	±	2.85%	1.3810E+16	±	7.82%	6.4139E+17	±	1.92%
1000.00	7.5262E+16	±	5.49%	1.8541E+17	±	3.72%	2.0424E+17	±	2.15%	5.0781E+17	±	2.53%	2.2412E+16	±	6.71%	9.9514E+17	±	1.71%
825.00	1.1035E+17	±	5.74%	2.5309E+17	±	3.46%	2.8303E+17	±	1.95%	6.9846E+17	±	2.18%	3.0143E+16	±	6.92%	1.3751E+18	±	1.51%
675.00	1.4086E+17	±	4.82%	3.2403E+17	±	3.06%	3.7757E+17	±	1.86%	1.0124E+18	±	1.95%	4.3831E+16	±	5.33%	1.8987E+18	±	1.35%
525.00	1.7181E+17	±	4.22%	4.0697E+17	±	2.89%	4.6985E+17	±	1.78%	1.4116E+18	±	1.63%	6.0799E+16	±	5.12%	2.5210E+18	±	1.20%
375.00	2.1480E+17	±	3.93%	5.0039E+17	±	2.56%	5.9972E+17	±	1.52%	1.9674E+18	±	1.52%	8.6383E+16	±	5.44%	3.3687E+18	±	1.10%
250.00	2.3872E+17	±	4.36%	5.8829E+17	±	2.75%	6.8083E+17	±	1.76%	2.3488E+18	±	1.59%	1.0283E+17	±	4.56%	3.9595E+18	±	1.15%
150.00	2.4505E+17	±	4.36%	6.4117E+17	±	2.70%	7.5783E+17	±	1.69%	2.6375E+18	±	1.51%	1.2146E+17	±	4.71%	4.4030E+18	±	1.10%
50.00	2.7276E+17	±	4.05%	6.6067E+17	±	2.68%	7.9544E+17	±	1.76%	2.7616E+18	±	1.48%	1.2329E+17	±	4.96%	4.6137E+18	±	1.10%
-50.00	2.6110E+17	±	4.16%	6.9544E+17	±	2.72%	7.5021E+17	±	1.52%	2.7331E+18	±	1.50%	1.1861E+17	±	4.57%	4.5585E+18	±	1.10%
-150.00	2.3283E+17	±	4.18%	6.2471E+17	±	2.72%	7.2996E+17	±	1.64%	2.6232E+18	±	1.50%	1.1660E+17	±	4.62%	4.3272E+18	±	1.10%
-250.00	2.3083E+17	±	4.20%	5.7223E+17	±	2.75%	6.8897E+17	±	1.74%	2.3936E+18	±	1.64%	1.1543E+17	±	5.32%	4.0011E+18	±	1.19%
-375.00	2.0568E+17	±	3.73%	5.4032E+17	±	2.47%	5.9406E+17	±	1.54%	1.9726E+18	±	1.42%	9.2981E+16	±	4.52%	3.4057E+18	±	1.04%
-525.00	1.9561E+17	±	4.05%	4.4228E+17	±	2.70%	5.0556E+17	±	1.73%	1.5587E+18	±	1.63%	6.7587E+16	±	4.55%	2.7697E+18	±	1.17%
-675.00	1.4424E+17	±	4.64%	3.6075E+17	±	3.09%	3.8799E+17	±	1.70%	1.1016E+18	±	1.80%	4.6008E+16	±	5.09%	2.0405E+18	±	1.28%
-825.00	1.2335E+17	±	5.58%	2.5696E+17	±	3.64%	3.0123E+17	±	1.97%	8.4153E+17	±	2.10%	3.6260E+16	±	5.93%	1.5593E+18	±	1.50%
-1000.00	8.1747E+16	±	5.62%	1.9814E+17	±	3.63%	2.2133E+17	±	2.05%	5.4815E+17	±	2.33%	2.3821E+16	±	6.46%	1.0732E+18	±	1.60%
-1200.00	5.0324E+16	±	6.14%	1.1798E+17	±	4.31%	1.3627E+17	±	2.55%	3.3185E+17	±	2.67%	1.3055E+16	±	7.74%	6.4948E+17	±	1.85%
-1475.00	2.7397E+16	±	8.28%	7.1482E+16	±	5.99%	8.0186E+16	±	3.10%	1.9493E+17	±	3.30%	6.7713E+15	±	9.66%	3.8077E+17	±	2.39%
-1721.75	1.2091E+16	±	13.89%	2.7964E+16	±	9.75%	5.8747E+16	±	5.13%	1.1501E+17	±	4.64%	2.5461E+15	±	18.74%	2.1635E+17	±	3.39%

Table E-74. Five-group Photon Spectrum (m^2s^{-1}) in the Through Tube HB-5/HB-10 Cooling Jacket. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
1721.75	1.2631E+16	± 12.69%	2.5076E+16	± 10.95%	5.6767E+16	± 5.16%	1.1935E+17	± 5.11%	6.0201E+15	± 15.73%	2.1984E+17	± 3.62%
1475.00	3.1236E+16	± 10.23%	6.6795E+16	± 6.41%	8.6632E+16	± 3.73%	2.1066E+17	± 3.28%	9.8449E+15	± 9.20%	4.0517E+17	± 2.48%
1225.00	5.3761E+16	± 8.70%	1.0208E+17	± 4.42%	1.1554E+17	± 2.63%	3.3185E+17	± 3.11%	2.2094E+16	± 6.59%	6.2532E+17	± 2.13%
1000.00	7.4537E+16	± 6.28%	1.5944E+17	± 4.21%	1.7389E+17	± 2.14%	5.0054E+17	± 2.45%	3.3230E+16	± 6.76%	9.4165E+17	± 1.73%
825.00	9.6719E+16	± 5.74%	2.2116E+17	± 3.51%	2.4970E+17	± 2.08%	6.9989E+17	± 2.26%	4.7527E+16	± 6.16%	1.3150E+18	± 1.56%
675.00	1.2647E+17	± 5.29%	2.9588E+17	± 3.25%	3.2940E+17	± 1.95%	1.0725E+18	± 2.28%	6.8075E+16	± 5.27%	1.8923E+18	± 1.54%
525.00	1.5856E+17	± 4.71%	3.6932E+17	± 3.01%	4.1821E+17	± 1.66%	1.4198E+18	± 1.77%	8.9686E+16	± 4.56%	2.4556E+18	± 1.26%
375.00	1.9149E+17	± 4.16%	4.8288E+17	± 2.89%	5.4982E+17	± 1.82%	2.0352E+18	± 1.59%	1.3036E+17	± 3.88%	3.3897E+18	± 1.16%
250.00	2.0529E+17	± 4.40%	5.1316E+17	± 3.00%	6.1232E+17	± 2.04%	2.4346E+18	± 1.64%	1.7983E+17	± 4.87%	3.9452E+18	± 1.23%
150.00	2.2011E+17	± 4.32%	5.7713E+17	± 3.07%	6.7087E+17	± 1.69%	2.7632E+18	± 1.67%	2.0049E+17	± 4.06%	4.4318E+18	± 1.21%
50.00	2.5094E+17	± 4.18%	5.9035E+17	± 2.83%	7.2374E+17	± 1.93%	2.9289E+18	± 1.59%	2.0064E+17	± 4.27%	4.6946E+18	± 1.17%
-50.00	2.2243E+17	± 4.20%	6.0124E+17	± 2.72%	7.1430E+17	± 1.80%	2.8440E+18	± 1.54%	2.0810E+17	± 4.19%	4.5901E+18	± 1.14%
-150.00	2.2366E+17	± 4.81%	5.3777E+17	± 2.83%	6.7817E+17	± 2.01%	2.7257E+18	± 1.60%	2.0200E+17	± 4.25%	4.3673E+18	± 1.19%
-250.00	2.0362E+17	± 4.55%	5.0854E+17	± 2.95%	6.2769E+17	± 1.86%	2.5027E+18	± 1.74%	1.9661E+17	± 4.78%	4.0392E+18	± 1.26%
-375.00	1.9374E+17	± 4.58%	4.8758E+17	± 2.67%	5.4794E+17	± 1.86%	2.0966E+18	± 1.59%	1.2769E+17	± 3.82%	3.4535E+18	± 1.16%
-525.00	1.7209E+17	± 4.20%	3.8674E+17	± 3.14%	4.5139E+17	± 1.63%	1.5632E+18	± 1.64%	1.1162E+17	± 4.39%	2.6850E+18	± 1.19%
-675.00	1.3669E+17	± 5.04%	3.1994E+17	± 3.28%	3.5170E+17	± 2.10%	1.1033E+18	± 1.86%	7.4234E+16	± 4.88%	1.9858E+18	± 1.34%
-825.00	9.9458E+16	± 6.00%	2.2903E+17	± 3.84%	2.6939E+17	± 2.27%	8.2879E+17	± 2.30%	4.8180E+16	± 5.49%	1.4748E+18	± 1.63%
-1000.00	6.5912E+16	± 5.55%	1.7550E+17	± 3.90%	1.9138E+17	± 2.22%	5.3745E+17	± 2.35%	3.6717E+16	± 7.00%	1.0070E+18	± 1.68%
-1200.00	4.4936E+16	± 6.44%	1.1050E+17	± 4.19%	1.1788E+17	± 2.32%	3.2243E+17	± 2.68%	1.7009E+16	± 6.76%	6.1276E+17	± 1.85%
-1475.00	2.8923E+16	± 8.73%	5.9789E+16	± 6.08%	7.9623E+16	± 4.42%	2.0405E+17	± 3.35%	1.0415E+16	± 8.63%	3.8280E+17	± 2.52%
-1721.75	1.3464E+16	± 14.72%	2.2065E+16	± 9.53%	5.7509E+16	± 5.59%	1.1082E+17	± 4.77%	4.4373E+15	± 14.33%	2.0829E+17	± 3.45%

Table E-75. Five-group Photon Spectrum (m^2s^{-1}) in the Large Slant Beam Tube Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-57.50	1.9990E+17 ±	4.86%	5.0786E+17 ±	3.28%	5.9518E+17 ±	2.64%	2.4999E+18 ±	1.82%	1.2082E+17 ±	5.34%	3.9236E+18 ±	1.39%
50.00	2.0439E+17 ±	5.36%	4.7558E+17 ±	3.40%	5.9619E+17 ±	2.26%	2.3621E+18 ±	1.70%	1.1629E+17 ±	5.73%	3.7545E+18 ±	1.30%
175.00	1.7726E+17 ±	4.87%	4.3213E+17 ±	2.94%	5.2259E+17 ±	1.73%	1.9572E+18 ±	1.64%	9.6953E+16 ±	4.80%	3.1861E+18 ±	1.20%
325.00	1.3578E+17 ±	5.61%	3.7010E+17 ±	3.53%	4.5789E+17 ±	2.25%	1.5009E+18 ±	2.02%	7.1493E+16 ±	6.52%	2.5362E+18 ±	1.47%
500.00	1.0480E+17 ±	5.28%	2.8624E+17 ±	3.43%	3.1705E+17 ±	2.07%	1.0387E+18 ±	2.13%	5.1905E+16 ±	6.06%	1.7987E+18 ±	1.50%
700.00	7.6430E+16 ±	6.45%	1.9102E+17 ±	4.25%	2.2329E+17 ±	2.55%	6.2412E+17 ±	2.57%	3.2786E+16 ±	7.69%	1.1476E+18 ±	1.79%
900.00	4.6104E+16 ±	7.66%	1.2159E+17 ±	5.30%	1.3944E+17 ±	2.69%	3.6298E+17 ±	3.27%	1.6263E+16 ±	9.78%	6.8638E+17 ±	2.25%
1125.00	3.0255E+16 ±	9.40%	7.6861E+16 ±	6.03%	8.5505E+16 ±	3.70%	2.0849E+17 ±	3.87%	1.0323E+16 ±	11.24%	4.1143E+17 ±	2.64%
1375.00	1.9044E+16 ±	10.81%	4.0512E+16 ±	7.99%	5.1688E+16 ±	4.21%	1.2264E+17 ±	6.08%	4.4461E+15 ±	11.88%	2.3833E+17 ±	3.79%
1675.00	1.0529E+16 ±	12.69%	2.3449E+16 ±	8.27%	2.7613E+16 ±	4.70%	6.1448E+16 ±	4.89%	2.9679E+15 ±	15.29%	1.2601E+17 ±	3.46%

Table E-76. Five-group Photon Spectrum (m^2s^{-1}) in the Large Slant Beam Tube Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-52.50	2.1559E+17 ±	4.24%	4.9226E+17 ±	2.98%	5.6180E+17 ±	2.40%	2.5587E+18 ±	1.60%	1.8253E+17 ±	3.86%	4.0108E+18 ±	1.22%
50.00	1.7484E+17 ±	4.75%	4.7685E+17 ±	3.29%	5.5501E+17 ±	2.18%	2.3676E+18 ±	1.59%	1.7745E+17 ±	4.61%	3.7518E+18 ±	1.21%
175.00	1.6949E+17 ±	4.21%	4.1723E+17 ±	2.80%	5.0831E+17 ±	1.84%	2.0614E+18 ±	1.55%	1.4693E+17 ±	4.22%	3.3034E+18 ±	1.16%
325.00	1.2717E+17 ±	4.72%	3.4039E+17 ±	3.34%	4.2214E+17 ±	2.17%	1.5267E+18 ±	1.75%	1.0316E+17 ±	4.46%	2.5195E+18 ±	1.31%
500.00	9.1411E+16 ±	4.84%	2.6276E+17 ±	3.40%	3.0745E+17 ±	2.06%	1.0399E+18 ±	1.96%	7.2433E+16 ±	4.91%	1.7739E+18 ±	1.43%
700.00	6.2990E+16 ±	5.58%	1.6935E+17 ±	3.81%	2.1231E+17 ±	2.70%	6.1101E+17 ±	2.41%	3.7511E+16 ±	6.01%	1.0932E+18 ±	1.70%
900.00	4.7419E+16 ±	7.60%	1.1148E+17 ±	4.99%	1.2501E+17 ±	2.65%	3.4910E+17 ±	3.00%	2.0164E+16 ±	7.54%	6.5317E+17 ±	2.14%
1125.00	2.7763E+16 ±	10.50%	7.6339E+16 ±	5.85%	7.7816E+16 ±	3.37%	2.0218E+17 ±	3.75%	1.1725E+16 ±	9.39%	3.9582E+17 ±	2.60%
1375.00	1.4820E+16 ±	9.47%	3.8320E+16 ±	6.87%	4.8169E+16 ±	4.87%	1.1297E+17 ±	4.91%	7.8573E+15 ±	12.05%	2.2214E+17 ±	3.29%
1675.00	1.0081E+16 ±	10.98%	1.9946E+16 ±	7.32%	2.5076E+16 ±	4.36%	6.0147E+16 ±	4.39%	2.3598E+15 ±	12.26%	1.1761E+17 ±	3.20%

Table E-77. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-1 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
126.20	1.5681E+17 $\pm$ 15.20%	1.7680E+17 $\pm$ 14.34%	2.2135E+17 $\pm$ 10.76%	6.3940E+17 $\pm$ 8.92%	b	1.2405E+18 $\pm$ 5.99%
251.20	1.5538E+17 $\pm$ 13.12%	2.0878E+17 $\pm$ 13.27%	2.2400E+17 $\pm$ 9.03%	7.9658E+17 $\pm$ 7.32%	b	1.4610E+18 $\pm$ 5.67%
401.20	1.8464E+17 $\pm$ 13.16%	2.6287E+17 $\pm$ 12.49%	2.2155E+17 $\pm$ 9.57%	8.5488E+17 $\pm$ 7.69%	6.7107E+16 $\pm$ 26.70%	1.5910E+18 $\pm$ 5.35%
569.10	1.4390E+17 $\pm$ 11.39%	2.3948E+17 $\pm$ 13.21%	2.0389E+17 $\pm$ 8.12%	7.3912E+17 $\pm$ 7.73%	7.2121E+16 $\pm$ 22.09%	1.3985E+18 $\pm$ 5.18%
769.10	4.7791E+16 $\pm$ 21.52%	1.3874E+17 $\pm$ 14.95%	1.6830E+17 $\pm$ 11.57%	5.4179E+17 $\pm$ 8.07%	5.3545E+16 $\pm$ 17.99%	9.5017E+17 $\pm$ 5.74%
1026.20	5.6491E+16 $\pm$ 17.13%	9.9024E+16 $\pm$ 16.13%	1.1338E+17 $\pm$ 9.70%	3.1440E+17 $\pm$ 8.56%	2.3237E+16 $\pm$ 16.27%	6.0653E+17 $\pm$ 5.77%
1326.20	3.4443E+16 $\pm$ 24.90%	6.1380E+16 $\pm$ 20.01%	6.0799E+16 $\pm$ 10.15%	2.0829E+17 $\pm$ 10.66%	2.9167E+16 $\pm$ 25.18%	3.9408E+17 $\pm$ 7.35%
1626.20	b	2.3431E+16 $\pm$ 25.30%	5.3355E+16 $\pm$ 20.10%	b	b	2.7774E+17 $\pm$ 20.41%
2093.10	b	1.4583E+16 $\pm$ 27.28%	9.6084E+15 $\pm$ 15.25%	3.7438E+16 $\pm$ 18.04%	b	6.8104E+16 $\pm$ 12.38%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-78. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1.80	b	b	1.4986E+17 $\pm$ 24.54%	4.5925E+17 $\pm$ 20.69%	b	8.8603E+17 $\pm$ 13.95%
38.10	7.7844E+16 $\pm$ 19.77%	1.7549E+17 $\pm$ 12.92%	1.8524E+17 $\pm$ 9.94%	5.8649E+17 $\pm$ 8.80%	6.4624E+16 $\pm$ 20.84%	1.0897E+18 $\pm$ 5.99%
126.20	1.1360E+17 $\pm$ 15.22%	1.5319E+17 $\pm$ 11.59%	2.4880E+17 $\pm$ 10.44%	6.7128E+17 $\pm$ 6.59%	6.9823E+16 $\pm$ 15.44%	1.2567E+18 $\pm$ 4.74%
251.20	9.4501E+16 $\pm$ 12.45%	1.5951E+17 $\pm$ 9.41%	2.0092E+17 $\pm$ 7.54%	7.7768E+17 $\pm$ 5.50%	7.3059E+16 $\pm$ 13.20%	1.3057E+18 $\pm$ 4.01%
401.20	1.1739E+17 $\pm$ 11.40%	1.7349E+17 $\pm$ 9.14%	1.8438E+17 $\pm$ 5.89%	7.4960E+17 $\pm$ 5.17%	8.1313E+16 $\pm$ 13.04%	1.3062E+18 $\pm$ 3.69%
569.10	1.0071E+17 $\pm$ 11.18%	1.6330E+17 $\pm$ 9.17%	1.8907E+17 $\pm$ 5.40%	7.8600E+17 $\pm$ 5.27%	7.6969E+16 $\pm$ 11.49%	1.3160E+18 $\pm$ 3.73%
769.10	6.3724E+16 $\pm$ 14.02%	1.3076E+17 $\pm$ 10.33%	1.5294E+17 $\pm$ 6.81%	5.8585E+17 $\pm$ 5.54%	7.2496E+16 $\pm$ 12.39%	1.0058E+18 $\pm$ 4.02%
1026.20	4.3999E+16 $\pm$ 12.24%	1.0107E+17 $\pm$ 9.10%	1.1151E+17 $\pm$ 5.95%	3.8474E+17 $\pm$ 7.43%	4.0510E+16 $\pm$ 12.18%	6.8182E+17 $\pm$ 4.78%
1326.20	2.5401E+16 $\pm$ 19.24%	5.6193E+16 $\pm$ 12.61%	6.3108E+16 $\pm$ 7.64%	1.9297E+17 $\pm$ 7.43%	2.7932E+16 $\pm$ 24.79%	3.6560E+17 $\pm$ 5.44%
1626.20	1.1560E+16 $\pm$ 23.04%	3.1992E+16 $\pm$ 15.40%	3.9264E+16 $\pm$ 13.55%	1.2180E+17 $\pm$ 11.13%	1.2975E+16 $\pm$ 24.96%	2.1759E+17 $\pm$ 7.60%
2093.10	b	1.5026E+16 $\pm$ 21.96%	1.3210E+16 $\pm$ 23.01%	2.9464E+16 $\pm$ 12.19%	4.0572E+15 $\pm$ 24.67%	6.6615E+16 $\pm$ 9.38%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-79. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-1 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
126.20	$3.3790\text{E}+17 \pm 15.43\%$	$3.0016\text{E}+17 \pm 18.43\%$	$2.9022\text{E}+17 \pm 15.19\%$	$6.4233\text{E}+17 \pm 13.75\%$	b	$1.5962\text{E}+18 \pm 8.34\%$
251.20	$3.2181\text{E}+17 \pm 17.35\%$	$2.8914\text{E}+17 \pm 17.42\%$	$2.2849\text{E}+17 \pm 13.47\%$	$8.7793\text{E}+17 \pm 11.74\%$	$1.2268\text{E}+16 \pm 26.66\%$	$1.7296\text{E}+18 \pm 7.95\%$
401.20	$3.3392\text{E}+17 \pm 14.57\%$	$4.0862\text{E}+17 \pm 15.80\%$	$2.9780\text{E}+17 \pm 17.12\%$	$7.8712\text{E}+17 \pm 10.04\%$	b	$1.8434\text{E}+18 \pm 6.98\%$
569.10	$2.9336\text{E}+17 \pm 13.12\%$	$2.9882\text{E}+17 \pm 15.56\%$	$2.5469\text{E}+17 \pm 10.36\%$	$7.0684\text{E}+17 \pm 10.41\%$	$9.5095\text{E}+15 \pm 23.75\%$	$1.5632\text{E}+18 \pm 6.67\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-80. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Lower Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1125.00	b	b	$5.3396\text{E}+15 \pm 6.83\%$	$3.8132\text{E}+16 \pm 24.35\%$	b	$5.5710\text{E}+16 \pm 18.95\%$
775.00	b	b	$1.9830\text{E}+16 \pm 20.01\%$	$6.0109\text{E}+16 \pm 25.39\%$	b	$1.1151\text{E}+17 \pm 16.34\%$
525.00	b	b	b	$2.8104\text{E}+17 \pm 13.05\%$	b	$3.7478\text{E}+17 \pm 11.03\%$
300.00	b	$9.9142\text{E}+16 \pm 24.04\%$	$1.5304\text{E}+17 \pm 18.56\%$	$6.4093\text{E}+17 \pm 9.44\%$	$4.9961\text{E}+16 \pm 23.45\%$	$9.7081\text{E}+17 \pm 7.57\%$
100.00	$3.7410\text{E}+16 \pm 28.12\%$	$3.2198\text{E}+17 \pm 13.14\%$	$4.8072\text{E}+17 \pm 10.84\%$	$1.9182\text{E}+18 \pm 5.83\%$	$8.6164\text{E}+16 \pm 17.86\%$	$2.8445\text{E}+18 \pm 4.71\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-81. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1.80	6.8673E+17 $\pm$ 21.05%	2.9892E+18 $\pm$ 10.00%	5.2496E+18 $\pm$ 6.76%	4.1621E+19 $\pm$ 3.01%	2.7899E+18 $\pm$ 9.10%	5.3337E+19 $\pm$ 2.60%
36.90	6.3324E+17 $\pm$ 7.05%	3.1757E+18 $\pm$ 4.09%	5.1174E+18 $\pm$ 2.71%	4.4102E+19 $\pm$ 1.22%	2.7754E+18 $\pm$ 3.82%	5.5804E+19 $\pm$ 1.07%
116.70	7.4210E+17 $\pm$ 5.52%	3.4147E+18 $\pm$ 3.42%	6.7496E+18 $\pm$ 2.47%	4.9784E+19 $\pm$ 1.09%	2.4669E+18 $\pm$ 3.63%	6.3158E+19 $\pm$ 0.95%
184.60	7.3106E+17 $\pm$ 6.97%	4.1725E+18 $\pm$ 4.48%	7.5223E+18 $\pm$ 2.88%	5.3871E+19 $\pm$ 1.30%	2.3030E+18 $\pm$ 4.81%	6.8600E+19 $\pm$ 1.14%
234.60	5.7984E+17 $\pm$ 8.20%	3.9215E+18 $\pm$ 4.29%	7.6476E+18 $\pm$ 2.92%	5.4118E+19 $\pm$ 1.29%	2.4172E+18 $\pm$ 4.92%	6.8684E+19 $\pm$ 1.13%
309.60	6.8351E+17 $\pm$ 5.71%	3.7946E+18 $\pm$ 3.29%	7.4537E+18 $\pm$ 2.18%	5.3498E+19 $\pm$ 0.98%	2.5173E+18 $\pm$ 3.63%	6.7948E+19 $\pm$ 0.86%
409.60	5.6065E+17 $\pm$ 6.25%	3.3855E+18 $\pm$ 3.40%	6.7522E+18 $\pm$ 2.33%	4.7227E+19 $\pm$ 1.04%	2.1758E+18 $\pm$ 3.62%	6.0101E+19 $\pm$ 0.91%
509.60	5.5730E+17 $\pm$ 7.32%	2.6097E+18 $\pm$ 3.75%	5.3361E+18 $\pm$ 2.52%	3.8720E+19 $\pm$ 1.16%	1.7915E+18 $\pm$ 4.21%	4.9015E+19 $\pm$ 1.01%
609.60	4.9124E+17 $\pm$ 7.55%	1.8930E+18 $\pm$ 4.27%	3.6021E+18 $\pm$ 3.05%	2.6793E+19 $\pm$ 1.40%	1.2362E+18 $\pm$ 4.44%	3.4015E+19 $\pm$ 1.22%
831.90	1.7763E+17 $\pm$ 7.29%	9.1147E+17 $\pm$ 3.80%	1.3056E+18 $\pm$ 3.11%	8.3931E+18 $\pm$ 1.44%	5.6524E+17 $\pm$ 3.75%	1.1353E+19 $\pm$ 1.23%

Table E-82. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
113.10	2.3541E+18 $\pm$ 6.99%	4.6012E+18 $\pm$ 7.13%	6.9750E+18 $\pm$ 5.00%	3.8650E+19 $\pm$ 2.37%	2.9937E+17 $\pm$ 9.85%	5.2879E+19 $\pm$ 2.01%
181.00	2.0106E+18 $\pm$ 10.78%	4.4526E+18 $\pm$ 7.90%	8.1228E+18 $\pm$ 6.59%	4.4228E+19 $\pm$ 2.88%	2.7971E+17 $\pm$ 12.90%	5.9094E+19 $\pm$ 2.52%
231.00	2.2495E+18 $\pm$ 10.90%	4.5513E+18 $\pm$ 7.38%	7.5633E+18 $\pm$ 5.80%	4.4911E+19 $\pm$ 2.96%	2.6834E+17 $\pm$ 14.00%	5.9544E+19 $\pm$ 2.49%
306.00	1.8085E+18 $\pm$ 7.68%	4.5469E+18 $\pm$ 5.77%	7.8988E+18 $\pm$ 4.62%	4.3822E+19 $\pm$ 2.10%	2.8368E+17 $\pm$ 10.14%	5.8359E+19 $\pm$ 1.81%
406.00	1.9247E+18 $\pm$ 7.98%	3.9666E+18 $\pm$ 6.30%	7.3528E+18 $\pm$ 4.50%	3.9123E+19 $\pm$ 2.20%	2.4956E+17 $\pm$ 8.67%	5.2616E+19 $\pm$ 1.87%
506.00	1.6319E+18 $\pm$ 8.64%	3.4708E+18 $\pm$ 7.09%	5.5603E+18 $\pm$ 5.14%	3.1029E+19 $\pm$ 2.43%	1.8076E+17 $\pm$ 9.27%	4.1873E+19 $\pm$ 2.10%
606.00	1.3758E+18 $\pm$ 8.73%	2.7182E+18 $\pm$ 7.73%	3.9182E+18 $\pm$ 6.11%	2.0726E+19 $\pm$ 3.18%	1.4487E+17 $\pm$ 10.83%	2.8883E+19 $\pm$ 2.66%

Table E-83. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Upper Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
42.90	1.1490E+18 ± 6.59%	3.7395E+18 ± 4.95%	6.7859E+18 ± 3.97%	4.7126E+19 ± 1.66%	1.7547E+18 ± 6.59%	6.0555E+19 ± 1.44%
110.80	1.0325E+18 ± 9.00%	3.8006E+18 ± 6.42%	7.2699E+18 ± 4.36%	5.1256E+19 ± 2.03%	1.6653E+18 ± 10.02%	6.5024E+19 ± 1.76%
160.80	8.3049E+17 ± 9.61%	4.0865E+18 ± 6.18%	7.8436E+18 ± 4.45%	5.0772E+19 ± 1.96%	1.7092E+18 ± 9.56%	6.5242E+19 ± 1.71%
235.80	1.0976E+18 ± 7.98%	3.6851E+18 ± 4.54%	7.1637E+18 ± 3.16%	5.1228E+19 ± 1.51%	1.8407E+18 ± 6.44%	6.5015E+19 ± 1.30%
335.80	1.0191E+18 ± 7.65%	3.3274E+18 ± 4.95%	6.8239E+18 ± 3.38%	4.4914E+19 ± 1.57%	1.5442E+18 ± 6.55%	5.7629E+19 ± 1.36%
435.80	8.2710E+17 ± 7.28%	2.7384E+18 ± 5.54%	5.4187E+18 ± 3.84%	3.7105E+19 ± 1.77%	1.2237E+18 ± 6.94%	4.7313E+19 ± 1.53%
535.80	6.3984E+17 ± 8.33%	2.2897E+18 ± 6.44%	3.7943E+18 ± 5.17%	2.3958E+19 ± 2.11%	9.6718E+17 ± 9.41%	3.1649E+19 ± 1.84%
795.00	1.4773E+17 ± 12.93%	9.6755E+17 ± 6.14%	1.2776E+18 ± 4.55%	8.5623E+18 ± 2.13%	4.5604E+17 ± 6.48%	1.1411E+19 ± 1.81%

Table E-84. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-2 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1125.00	b	6.3084E+15 ± 27.56%	1.1359E+16 ± 23.52%	2.4516E+16 ± 16.56%	b	4.8510E+16 ± 11.97%
775.00	b	b	2.8454E+16 ± 20.15%	6.8191E+16 ± 16.61%	b	1.3609E+17 ± 12.22%
525.00	1.2840E+16 ± 28.47%	4.2295E+16 ± 17.92%	4.2517E+16 ± 17.36%	2.8951E+17 ± 9.35%	1.9181E+16 ± 23.44%	4.0634E+17 ± 7.40%
300.00	4.9459E+16 ± 25.63%	1.4379E+17 ± 17.80%	1.4799E+17 ± 11.81%	6.7321E+17 ± 6.50%	7.2481E+16 ± 15.16%	1.0869E+18 ± 5.47%
100.00	5.5835E+16 ± 18.35%	3.6373E+17 ± 8.47%	4.4139E+17 ± 7.15%	2.0294E+18 ± 4.03%	1.1782E+17 ± 9.10%	3.0081E+18 ± 3.22%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-85. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
126.20	$1.6779\text{E}+17 \pm 14.02\%$	$2.2332\text{E}+17 \pm 13.55\%$	$2.6341\text{E}+17 \pm 8.70\%$	$7.3011\text{E}+17 \pm 7.04\%$	$3.2667\text{E}+16 \pm 19.45\%$	$1.4173\text{E}+18 \pm 4.95\%$
251.20	$1.7109\text{E}+17 \pm 11.55\%$	$2.5734\text{E}+17 \pm 11.69\%$	$2.5828\text{E}+17 \pm 9.15\%$	$8.0572\text{E}+17 \pm 7.20\%$	$6.9226\text{E}+16 \pm 26.97\%$	$1.5617\text{E}+18 \pm 4.96\%$
401.20	$1.8719\text{E}+17 \pm 11.39\%$	$2.6903\text{E}+17 \pm 10.69\%$	$3.0110\text{E}+17 \pm 11.13\%$	$1.0125\text{E}+18 \pm 7.58\%$	$8.3897\text{E}+16 \pm 26.40\%$	$1.8537\text{E}+18 \pm 5.18\%$
569.10	$1.6796\text{E}+17 \pm 12.40\%$	$2.4821\text{E}+17 \pm 10.00\%$	$2.5308\text{E}+17 \pm 7.66\%$	$8.4251\text{E}+17 \pm 6.52\%$	$6.0908\text{E}+16 \pm 18.85\%$	$1.5727\text{E}+18 \pm 4.39\%$
769.10	$5.2146\text{E}+16 \pm 21.97\%$	$1.3203\text{E}+17 \pm 14.91\%$	$1.6729\text{E}+17 \pm 9.00\%$	$6.5870\text{E}+17 \pm 7.61\%$	$8.6632\text{E}+16 \pm 22.77\%$	$1.0968\text{E}+18 \pm 5.81\%$
1026.20	$5.1015\text{E}+16 \pm 18.56\%$	$1.0891\text{E}+17 \pm 14.00\%$	$1.3228\text{E}+17 \pm 9.09\%$	$4.5371\text{E}+17 \pm 8.57\%$	b	$8.1627\text{E}+17 \pm 6.27\%$
1326.20	b	$8.7918\text{E}+16 \pm 20.90\%$	$7.6850\text{E}+16 \pm 10.21\%$	$1.4359\text{E}+17 \pm 11.27\%$	b	$3.4487\text{E}+17 \pm 8.47\%$
1626.20	b	$3.6048\text{E}+16 \pm 21.68\%$	$4.2599\text{E}+16 \pm 15.77\%$	$8.0861\text{E}+16 \pm 14.91\%$	b	$1.8867\text{E}+17 \pm 9.72\%$
2093.10	b	$1.3372\text{E}+16 \pm 24.94\%$	$1.1983\text{E}+16 \pm 16.73\%$	$3.8077\text{E}+16 \pm 20.72\%$	$3.2737\text{E}+15 \pm 29.12\%$	$7.5990\text{E}+16 \pm 12.75\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-86. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1.80	b	b	b	$5.8490\text{E}+17 \pm 17.17\%$	b	$9.6826\text{E}+17 \pm 13.72\%$
38.10	$6.4833\text{E}+16 \pm 16.88\%$	$1.9082\text{E}+17 \pm 14.87\%$	$1.6806\text{E}+17 \pm 8.46\%$	$7.3609\text{E}+17 \pm 7.21\%$	$7.7413\text{E}+16 \pm 15.11\%$	$1.2372\text{E}+18 \pm 5.33\%$
126.20	$1.2068\text{E}+17 \pm 12.28\%$	$2.5434\text{E}+17 \pm 9.66\%$	$2.2830\text{E}+17 \pm 7.04\%$	$7.8737\text{E}+17 \pm 5.83\%$	$5.3341\text{E}+16 \pm 11.42\%$	$1.4440\text{E}+18 \pm 4.03\%$
251.20	$9.2601\text{E}+16 \pm 10.65\%$	$2.0812\text{E}+17 \pm 8.44\%$	$2.3288\text{E}+17 \pm 6.56\%$	$9.1457\text{E}+17 \pm 5.01\%$	$8.6629\text{E}+16 \pm 12.92\%$	$1.5348\text{E}+18 \pm 3.58\%$
401.20	$1.2993\text{E}+17 \pm 11.43\%$	$2.5236\text{E}+17 \pm 8.07\%$	$2.5311\text{E}+17 \pm 6.09\%$	$1.0631\text{E}+18 \pm 4.73\%$	$9.7933\text{E}+16 \pm 11.42\%$	$1.7965\text{E}+18 \pm 3.42\%$
569.10	$1.1019\text{E}+17 \pm 9.13\%$	$2.1649\text{E}+17 \pm 8.68\%$	$1.9990\text{E}+17 \pm 5.19\%$	$9.1889\text{E}+17 \pm 5.00\%$	$1.0298\text{E}+17 \pm 10.70\%$	$1.5484\text{E}+18 \pm 3.51\%$
769.10	$7.1098\text{E}+16 \pm 16.03\%$	$1.4946\text{E}+17 \pm 9.74\%$	$1.6782\text{E}+17 \pm 6.25\%$	$6.2497\text{E}+17 \pm 4.83\%$	$9.5429\text{E}+16 \pm 15.09\%$	$1.1088\text{E}+18 \pm 3.77\%$
1026.20	$4.8533\text{E}+16 \pm 12.09\%$	$1.1152\text{E}+17 \pm 8.63\%$	$1.3281\text{E}+17 \pm 7.13\%$	$4.1311\text{E}+17 \pm 5.79\%$	$5.1524\text{E}+16 \pm 12.04\%$	$7.5749\text{E}+17 \pm 3.98\%$
1326.20	$2.9998\text{E}+16 \pm 19.01\%$	$6.3314\text{E}+16 \pm 10.72\%$	$7.1913\text{E}+16 \pm 8.01\%$	$1.8797\text{E}+17 \pm 8.64\%$	$3.0784\text{E}+16 \pm 20.24\%$	$3.8398\text{E}+17 \pm 6.00\%$
1626.20	$1.6286\text{E}+16 \pm 24.80\%$	$3.2787\text{E}+16 \pm 16.41\%$	$4.0216\text{E}+16 \pm 10.82\%$	$9.0282\text{E}+16 \pm 12.71\%$	$8.9261\text{E}+15 \pm 22.14\%$	$1.8850\text{E}+17 \pm 7.69\%$
2093.10	$7.7148\text{E}+15 \pm 25.31\%$	$9.2973\text{E}+15 \pm 17.26\%$	$1.0796\text{E}+16 \pm 9.99\%$	$3.2173\text{E}+16 \pm 11.18\%$	$3.4997\text{E}+15 \pm 19.55\%$	$6.3480\text{E}+16 \pm 7.63\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-87. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-3 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
126.20	$2.8107\text{E}+17 \pm 16.20\%$	$3.0550\text{E}+17 \pm 16.76\%$	$3.2532\text{E}+17 \pm 11.85\%$	$9.3207\text{E}+17 \pm 10.70\%$	$1.9546\text{E}+16 \pm 27.56\%$	$1.8635\text{E}+18 \pm 7.27\%$
251.20	$4.3771\text{E}+17 \pm 13.59\%$	$4.1471\text{E}+17 \pm 14.10\%$	$2.8888\text{E}+17 \pm 12.29\%$	$8.9302\text{E}+17 \pm 11.75\%$	$1.5424\text{E}+16 \pm 26.17\%$	$2.0497\text{E}+18 \pm 7.11\%$
401.20	$4.0325\text{E}+17 \pm 12.68\%$	$4.4906\text{E}+17 \pm 12.79\%$	$3.7425\text{E}+17 \pm 19.28\%$	$9.2336\text{E}+17 \pm 9.01\%$	$1.6614\text{E}+16 \pm 25.09\%$	$2.1665\text{E}+18 \pm 6.36\%$
569.10	$3.4722\text{E}+17 \pm 12.72\%$	$3.5548\text{E}+17 \pm 14.10\%$	$3.2488\text{E}+17 \pm 10.91\%$	$9.2333\text{E}+17 \pm 8.67\%$	$2.0973\text{E}+16 \pm 18.84\%$	$1.9719\text{E}+18 \pm 5.85\%$

Table E-88. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Lower Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
126.20	$1.4247\text{E}+18 \pm 5.12\%$	$2.5991\text{E}+18 \pm 5.13\%$	$3.6083\text{E}+18 \pm 4.41\%$	$2.3884\text{E}+19 \pm 2.14\%$	$1.2700\text{E}+18 \pm 7.32\%$	$3.2786\text{E}+19 \pm 1.75\%$
251.20	$1.3300\text{E}+18 \pm 4.75\%$	$2.5861\text{E}+18 \pm 4.27\%$	$3.5007\text{E}+18 \pm 3.42\%$	$2.5192\text{E}+19 \pm 1.70\%$	$1.2874\text{E}+18 \pm 5.39\%$	$3.3896\text{E}+19 \pm 1.40\%$
401.20	$1.3287\text{E}+18 \pm 4.88\%$	$2.7188\text{E}+18 \pm 4.40\%$	$4.3671\text{E}+18 \pm 3.38\%$	$2.8504\text{E}+19 \pm 1.57\%$	$1.5425\text{E}+18 \pm 5.60\%$	$3.8461\text{E}+19 \pm 1.32\%$
526.20	$1.0606\text{E}+18 \pm 6.55\%$	$2.9012\text{E}+18 \pm 5.02\%$	$4.2541\text{E}+18 \pm 3.89\%$	$3.0521\text{E}+19 \pm 1.80\%$	$1.4698\text{E}+18 \pm 6.30\%$	$4.0207\text{E}+19 \pm 1.53\%$
619.10	$1.0169\text{E}+18 \pm 6.93\%$	$2.9307\text{E}+18 \pm 5.52\%$	$4.1887\text{E}+18 \pm 4.43\%$	$2.9676\text{E}+19 \pm 1.97\%$	$1.4269\text{E}+18 \pm 7.40\%$	$3.9239\text{E}+19 \pm 1.68\%$
712.00	$4.1794\text{E}+17 \pm 12.03\%$	$1.8203\text{E}+18 \pm 6.61\%$	$3.5590\text{E}+18 \pm 4.56\%$	$2.7937\text{E}+19 \pm 1.99\%$	$1.7844\text{E}+18 \pm 7.09\%$	$3.5519\text{E}+19 \pm 1.74\%$
812.00	$3.3003\text{E}+17 \pm 17.03\%$	$1.7120\text{E}+18 \pm 7.50\%$	$3.1015\text{E}+18 \pm 5.21\%$	$2.2469\text{E}+19 \pm 2.32\%$	$1.6137\text{E}+18 \pm 7.30\%$	$2.9226\text{E}+19 \pm 2.01\%$
912.00	$2.3732\text{E}+17 \pm 15.48\%$	$1.2376\text{E}+18 \pm 8.78\%$	$1.8922\text{E}+18 \pm 6.08\%$	$1.6103\text{E}+19 \pm 2.69\%$	$1.1835\text{E}+18 \pm 9.86\%$	$2.0653\text{E}+19 \pm 2.34\%$
1188.55	$1.0345\text{E}+16 \pm 10.32\%$	$4.7374\text{E}+16 \pm 6.06\%$	$7.4826\text{E}+16 \pm 4.63\%$	$4.5678\text{E}+17 \pm 2.37\%$	$3.7978\text{E}+16 \pm 7.56\%$	$6.2731\text{E}+17 \pm 1.98\%$

Table E-89. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1.80	3.9568E+17 $\pm$ 18.70%	1.3966E+18 $\pm$ 13.17%	3.3052E+18 $\pm$ 12.13%	2.1353E+19 $\pm$ 4.43%	2.2935E+18 $\pm$ 14.23%	2.8744E+19 $\pm$ 3.83%
38.10	4.8808E+17 $\pm$ 8.12%	1.9150E+18 $\pm$ 4.85%	2.8297E+18 $\pm$ 3.39%	2.3233E+19 $\pm$ 1.70%	2.0589E+18 $\pm$ 4.27%	3.0525E+19 $\pm$ 1.44%
126.20	8.1820E+17 $\pm$ 4.93%	2.2616E+18 $\pm$ 3.89%	3.3108E+18 $\pm$ 2.91%	2.4753E+19 $\pm$ 1.41%	1.9293E+18 $\pm$ 3.72%	3.3073E+19 $\pm$ 1.18%
251.20	7.9880E+17 $\pm$ 4.33%	2.1819E+18 $\pm$ 3.11%	3.5361E+18 $\pm$ 2.46%	2.7000E+19 $\pm$ 1.14%	2.0758E+18 $\pm$ 3.10%	3.5593E+19 $\pm$ 0.96%
401.20	8.2969E+17 $\pm$ 4.08%	2.4177E+18 $\pm$ 3.17%	3.9413E+18 $\pm$ 2.36%	3.0787E+19 $\pm$ 1.08%	2.2854E+18 $\pm$ 2.98%	4.0261E+19 $\pm$ 0.92%
526.20	7.4513E+17 $\pm$ 5.74%	2.5898E+18 $\pm$ 3.77%	4.3279E+18 $\pm$ 2.72%	3.3391E+19 $\pm$ 1.24%	2.1472E+18 $\pm$ 3.48%	4.3201E+19 $\pm$ 1.06%
619.10	6.4883E+17 $\pm$ 6.24%	2.4985E+18 $\pm$ 4.12%	4.2341E+18 $\pm$ 3.07%	3.1525E+19 $\pm$ 1.31%	2.0970E+18 $\pm$ 3.83%	4.1003E+19 $\pm$ 1.13%
712.00	3.9448E+17 $\pm$ 7.97%	1.9467E+18 $\pm$ 4.20%	3.5548E+18 $\pm$ 2.96%	2.8539E+19 $\pm$ 1.33%	2.0774E+18 $\pm$ 3.87%	3.6513E+19 $\pm$ 1.16%
812.00	3.3136E+17 $\pm$ 9.77%	1.6025E+18 $\pm$ 4.75%	2.6481E+18 $\pm$ 3.16%	2.2609E+19 $\pm$ 1.49%	1.7385E+18 $\pm$ 4.16%	2.8930E+19 $\pm$ 1.29%
912.00	2.6910E+17 $\pm$ 9.73%	1.2068E+18 $\pm$ 6.40%	2.0513E+18 $\pm$ 4.17%	1.5785E+19 $\pm$ 1.78%	1.3460E+18 $\pm$ 4.96%	2.0658E+19 $\pm$ 1.55%
1188.55	1.1230E+17 $\pm$ 7.57%	5.0635E+17 $\pm$ 4.27%	7.5607E+17 $\pm$ 3.22%	4.6027E+18 $\pm$ 1.60%	3.9362E+17 $\pm$ 3.88%	6.3710E+18 $\pm$ 1.34%

Table E-90. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
569.10	2.2192E+18 $\pm$ 5.52%	3.7218E+18 $\pm$ 4.87%	4.4760E+18 $\pm$ 3.99%	2.5507E+19 $\pm$ 1.96%	2.6828E+17 $\pm$ 8.26%	3.6193E+19 $\pm$ 1.63%
401.20	2.6303E+18 $\pm$ 5.24%	3.7284E+18 $\pm$ 5.48%	4.7231E+18 $\pm$ 7.05%	2.3903E+19 $\pm$ 2.23%	2.7863E+17 $\pm$ 8.72%	3.5263E+19 $\pm$ 1.96%
251.20	2.6104E+18 $\pm$ 5.28%	3.2691E+18 $\pm$ 5.16%	4.3335E+18 $\pm$ 4.57%	2.0484E+19 $\pm$ 2.32%	2.3273E+17 $\pm$ 9.81%	3.0930E+19 $\pm$ 1.86%
126.20	3.0832E+18 $\pm$ 5.61%	3.4993E+18 $\pm$ 6.34%	4.1289E+18 $\pm$ 5.26%	1.8819E+19 $\pm$ 5.04%	2.3116E+17 $\pm$ 11.40%	2.9762E+19 $\pm$ 2.33%

Table E-91. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Upper Flight Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
300.00	b	b	$3.1220\text{E}+16 \pm 17.12\%$	$2.3277\text{E}+17 \pm 15.07\%$	b	$3.3795\text{E}+17 \pm 11.81\%$
525.00	b	b	$1.5296\text{E}+16 \pm 16.75\%$	$1.0007\text{E}+17 \pm 18.89\%$	b	$1.4862\text{E}+17 \pm 15.20\%$
775.00	a	b	$5.6271\text{E}+15 \pm 8.98\%$	$3.6791\text{E}+16 \pm 27.45\%$	b	$4.9462\text{E}+16 \pm 21.38\%$
1035.00	b	b	$3.4790\text{E}+15 \pm 9.98\%$	b	b	$6.4410\text{E}+16 \pm 29.63\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-92. Five-group Photon Spectrum (m^2s^{-1}) in the Hydraulic Tube HT-4 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	$1.9810\text{E}+16 \pm 24.88\%$	$1.0048\text{E}+17 \pm 15.84\%$	$1.4275\text{E}+17 \pm 11.67\%$	$6.3637\text{E}+17 \pm 6.77\%$	$5.2492\text{E}+16 \pm 19.28\%$	$9.5190\text{E}+17 \pm 5.49\%$
300.00	b	$3.5899\text{E}+16 \pm 23.27\%$	$5.1689\text{E}+16 \pm 18.24\%$	$2.1123\text{E}+17 \pm 12.07\%$	$1.8795\text{E}+16 \pm 19.80\%$	$3.2977\text{E}+17 \pm 8.98\%$
525.00	b	$2.5462\text{E}+16 \pm 28.45\%$	$2.4256\text{E}+16 \pm 25.27\%$	$1.0102\text{E}+17 \pm 12.89\%$	$1.1034\text{E}+16 \pm 26.76\%$	$1.6943\text{E}+17 \pm 10.21\%$
775.00	b	b	$1.0068\text{E}+16 \pm 16.38\%$	$4.5066\text{E}+16 \pm 17.04\%$	$3.5657\text{E}+15 \pm 29.97\%$	$7.1736\text{E}+16 \pm 12.34\%$
1035.00	b	b	$5.6330\text{E}+15 \pm 23.95\%$	$2.2706\text{E}+16 \pm 24.00\%$	b	$4.2195\text{E}+16 \pm 16.55\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-93. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Lower Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
7.40	2.2066E+18	± 6.30%	3.8266E+18	± 5.18%	4.6115E+18	± 4.51%	3.3805E+19	± 2.73%	1.1358E+18	± 9.68%	4.5585E+19	± 2.18%
44.70	2.2770E+18	± 2.70%	3.9445E+18	± 3.07%	5.3361E+18	± 2.56%	3.5668E+19	± 1.27%	1.1695E+18	± 5.24%	4.8395E+19	± 1.05%
106.20	2.2336E+18	± 3.10%	4.0877E+18	± 3.43%	5.8166E+18	± 2.85%	3.8204E+19	± 1.36%	1.0523E+18	± 7.30%	5.1395E+19	± 1.14%
181.20	2.1269E+18	± 2.41%	4.0328E+18	± 2.47%	6.1792E+18	± 2.19%	3.9413E+19	± 1.01%	1.0759E+18	± 4.89%	5.2828E+19	± 0.84%
281.20	1.8237E+18	± 2.60%	3.5731E+18	± 2.63%	5.9194E+18	± 2.21%	3.6977E+19	± 1.03%	9.6978E+17	± 5.46%	4.9263E+19	± 0.87%
366.13	7.0787E+17	± 6.83%	2.8470E+18	± 3.81%	5.6253E+18	± 2.68%	3.6578E+19	± 1.18%	1.4642E+18	± 5.11%	4.7222E+19	± 1.02%
441.13	4.1772E+17	± 8.34%	2.3390E+18	± 3.86%	4.9149E+18	± 2.47%	3.3223E+19	± 1.14%	1.3720E+18	± 4.39%	4.2266E+19	± 1.00%
556.20	2.9606E+17	± 6.47%	1.6870E+18	± 3.81%	3.1242E+18	± 2.22%	2.2721E+19	± 1.13%	1.0581E+18	± 3.95%	2.8886E+19	± 0.97%
715.58	2.3065E+17	± 9.24%	9.4768E+17	± 6.24%	1.5825E+18	± 3.81%	1.2112E+19	± 1.86%	7.6137E+17	± 6.54%	1.5634E+19	± 1.60%

Table E-94. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
1.75	1.4713E+18	± 5.55%	3.0265E+18	± 4.11%	4.8543E+18	± 3.32%	3.6573E+19	± 1.59%	2.0752E+18	± 6.13%	4.8000E+19	± 1.36%
42.35	1.4917E+18	± 2.67%	3.2674E+18	± 2.30%	5.4688E+18	± 2.12%	3.8818E+19	± 0.91%	1.8071E+18	± 3.11%	5.0853E+19	± 0.78%
106.20	1.5471E+18	± 3.35%	3.4692E+18	± 2.74%	5.9695E+18	± 2.23%	4.1304E+19	± 1.03%	1.7403E+18	± 4.09%	5.4030E+19	± 0.88%
181.20	1.4332E+18	± 2.55%	3.6798E+18	± 2.11%	6.1795E+18	± 1.77%	4.2040E+19	± 0.77%	1.7081E+18	± 2.93%	5.5041E+19	± 0.67%
281.20	1.2394E+18	± 2.64%	3.3042E+18	± 2.26%	5.8390E+18	± 1.71%	4.0318E+19	± 0.80%	1.5577E+18	± 2.85%	5.2258E+19	± 0.69%
366.13	6.1324E+17	± 4.88%	2.9241E+18	± 3.19%	5.5974E+18	± 2.09%	3.7796E+19	± 0.97%	1.7002E+18	± 3.35%	4.8631E+19	± 0.85%
441.13	3.8828E+17	± 6.50%	2.4106E+18	± 3.23%	4.7444E+18	± 2.09%	3.3517E+19	± 0.96%	1.6115E+18	± 3.18%	4.2672E+19	± 0.84%
556.20	3.1242E+17	± 6.19%	1.6732E+18	± 3.01%	3.1968E+18	± 1.98%	2.2276E+19	± 0.90%	1.1947E+18	± 2.78%	2.8653E+19	± 0.79%
715.58	2.3695E+17	± 8.15%	9.6910E+17	± 4.62%	1.6651E+18	± 3.57%	1.2239E+19	± 1.51%	8.1460E+17	± 4.53%	1.5925E+19	± 1.31%

Table E-95. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-1 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
44.70	4.2994E+18 $\pm$ 2.21%	5.1745E+18 $\pm$ 2.33%	5.5348E+18 $\pm$ 2.17%	2.7080E+19 $\pm$ 1.17%	8.2252E+16 $\pm$ 4.02%	4.2171E+19 $\pm$ 0.97%
106.20	4.0647E+18 $\pm$ 2.66%	5.0135E+18 $\pm$ 2.64%	5.8958E+18 $\pm$ 2.47%	2.9581E+19 $\pm$ 1.33%	6.4416E+16 $\pm$ 4.95%	4.4619E+19 $\pm$ 1.09%
181.20	3.7329E+18 $\pm$ 2.12%	4.9097E+18 $\pm$ 2.03%	6.0785E+18 $\pm$ 1.91%	2.9897E+19 $\pm$ 1.01%	6.9509E+16 $\pm$ 3.78%	4.4687E+19 $\pm$ 0.85%
281.20	3.2744E+18 $\pm$ 2.27%	4.4466E+18 $\pm$ 2.15%	5.8801E+18 $\pm$ 1.94%	2.8396E+19 $\pm$ 1.01%	6.8120E+16 $\pm$ 3.74%	4.2065E+19 $\pm$ 0.86%

Table E-96. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Upper Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1225.00	4.3811E+15 $\pm$ 26.46%	1.6445E+16 $\pm$ 19.20%	1.2885E+16 $\pm$ 10.93%	4.6408E+16 $\pm$ 11.46%	3.4899E+15 $\pm$ 27.76%	8.3609E+16 $\pm$ 8.07%
775.00	1.6524E+16 $\pm$ 22.72%	4.6700E+16 $\pm$ 23.87%	5.5843E+16 $\pm$ 12.56%	2.0519E+17 $\pm$ 10.08%	1.3168E+16 $\pm$ 23.76%	3.3743E+17 $\pm$ 7.47%
525.00	3.3810E+16 $\pm$ 14.69%	1.0153E+17 $\pm$ 11.66%	1.3349E+17 $\pm$ 7.75%	6.6169E+17 $\pm$ 5.27%	4.4236E+16 $\pm$ 15.61%	9.7476E+17 $\pm$ 4.12%
300.00	6.8954E+16 $\pm$ 14.36%	2.9798E+17 $\pm$ 9.25%	4.3111E+17 $\pm$ 6.61%	2.0300E+18 $\pm$ 3.74%	1.1345E+17 $\pm$ 9.82%	2.9415E+18 $\pm$ 3.03%
100.00	1.5024E+17 $\pm$ 10.24%	6.6301E+17 $\pm$ 5.36%	8.9046E+17 $\pm$ 3.88%	5.9243E+18 $\pm$ 1.95%	3.5413E+17 $\pm$ 6.42%	7.9821E+18 $\pm$ 1.65%

Table E-97. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-1 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1225.00	3.0721E+15 $\pm$ 21.60%	1.4124E+16 $\pm$ 15.01%	1.2441E+16 $\pm$ 10.45%	4.3282E+16 $\pm$ 9.55%	3.5660E+15 $\pm$ 19.10%	7.6485E+16 $\pm$ 6.86%
775.00	1.6906E+16 $\pm$ 25.15%	3.8763E+16 $\pm$ 17.47%	4.8145E+16 $\pm$ 9.91%	1.9250E+17 $\pm$ 7.30%	1.8495E+16 $\pm$ 16.37%	3.1481E+17 $\pm$ 5.57%
525.00	4.1679E+16 $\pm$ 17.89%	1.0170E+17 $\pm$ 9.95%	1.3162E+17 $\pm$ 7.53%	6.0775E+17 $\pm$ 4.37%	5.6128E+16 $\pm$ 11.25%	9.3888E+17 $\pm$ 3.53%
300.00	5.9643E+16 $\pm$ 11.91%	3.0476E+17 $\pm$ 6.27%	3.8672E+17 $\pm$ 5.94%	1.9543E+18 $\pm$ 2.97%	1.3021E+17 $\pm$ 7.46%	2.8356E+18 $\pm$ 2.44%
100.00	1.2952E+17 $\pm$ 7.13%	6.4873E+17 $\pm$ 4.64%	8.9028E+17 $\pm$ 3.52%	5.7479E+18 $\pm$ 1.68%	3.8668E+17 $\pm$ 4.51%	7.8031E+18 $\pm$ 1.43%

Table E-98. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-2 Lower Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
7.40	2.3912E+18	±	5.51%	3.9530E+18	±	5.05%	5.1398E+18	±	4.39%	3.4172E+19	±	2.55%	1.1125E+18	±	8.88%	4.6768E+19	±	2.03%
44.70	2.3703E+18	±	2.61%	3.8852E+18	±	2.72%	5.4406E+18	±	2.43%	3.5389E+19	±	1.21%	1.1008E+18	±	5.82%	4.8185E+19	±	1.00%
106.20	2.3204E+18	±	3.27%	4.0774E+18	±	3.25%	5.9632E+18	±	2.78%	3.8564E+19	±	1.39%	1.1077E+18	±	7.14%	5.2032E+19	±	1.15%
181.20	2.1806E+18	±	2.47%	3.9303E+18	±	2.39%	6.3807E+18	±	2.19%	3.9585E+19	±	1.03%	1.0724E+18	±	4.63%	5.3149E+19	±	0.86%
281.20	1.8386E+18	±	2.45%	3.8602E+18	±	2.66%	5.7644E+18	±	2.12%	3.7203E+19	±	1.06%	1.0536E+18	±	5.06%	4.9720E+19	±	0.88%
366.13	7.3381E+17	±	6.66%	2.8650E+18	±	3.85%	5.6303E+18	±	2.57%	3.7968E+19	±	1.19%	1.4189E+18	±	5.04%	4.8615E+19	±	1.04%
441.13	4.0843E+17	±	8.51%	2.3788E+18	±	3.82%	4.8793E+18	±	2.69%	3.3970E+19	±	1.18%	1.3232E+18	±	4.25%	4.2960E+19	±	1.02%
556.20	2.8398E+17	±	8.00%	1.6012E+18	±	3.59%	3.0341E+18	±	2.31%	2.2355E+19	±	1.07%	1.0322E+18	±	3.85%	2.8307E+19	±	0.93%
715.58	2.6120E+17	±	10.01%	1.0696E+18	±	5.25%	1.5980E+18	±	3.96%	1.2046E+19	±	1.80%	7.0072E+17	±	6.53%	1.5675E+19	±	1.55%

Table E-99. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Tube SH-2 Lower Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
1.75	1.4887E+18	±	4.69%	2.8985E+18	±	4.30%	4.6798E+18	±	3.01%	3.7271E+19	±	1.63%	2.1948E+18	±	5.01%	4.8533E+19	±	1.36%
42.35	1.4826E+18	±	2.53%	3.3093E+18	±	2.53%	5.4184E+18	±	1.99%	3.8783E+19	±	0.90%	1.8192E+18	±	3.10%	5.0812E+19	±	0.77%
106.20	1.5629E+18	±	3.00%	3.5081E+18	±	2.79%	6.2173E+18	±	2.33%	4.1338E+19	±	1.04%	1.5841E+18	±	3.77%	5.4211E+19	±	0.88%
181.20	1.4375E+18	±	2.34%	3.5263E+18	±	2.15%	6.3346E+18	±	1.73%	4.2379E+19	±	0.78%	1.6247E+18	±	2.81%	5.5302E+19	±	0.67%
281.20	1.2146E+18	±	2.87%	3.4914E+18	±	2.25%	5.8288E+18	±	1.72%	4.0220E+19	±	0.80%	1.6119E+18	±	2.93%	5.2366E+19	±	0.68%
366.13	6.9725E+17	±	4.70%	2.7683E+18	±	3.06%	5.4637E+18	±	2.09%	3.9192E+19	±	0.97%	1.7250E+18	±	3.50%	4.9846E+19	±	0.85%
441.13	4.1860E+17	±	6.55%	2.2833E+18	±	3.14%	4.8121E+18	±	2.10%	3.4195E+19	±	0.96%	1.6002E+18	±	3.41%	4.3309E+19	±	0.85%
556.20	2.6566E+17	±	6.27%	1.5981E+18	±	2.79%	3.0868E+18	±	2.02%	2.2714E+19	±	0.90%	1.2118E+18	±	2.74%	2.8876E+19	±	0.80%
715.58	2.4716E+17	±	7.96%	1.0841E+18	±	4.59%	1.6810E+18	±	3.80%	1.1927E+19	±	1.55%	7.8400E+17	±	4.28%	1.5723E+19	±	1.34%

Table E-100. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 50% Al/50% SS-316 Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
44.70	4.2997E+18 $\pm$ 2.17%	5.1436E+18 $\pm$ 2.24%	5.7220E+18 $\pm$ 2.23%	2.7938E+19 $\pm$ 1.18%	8.7334E+16 $\pm$ 4.25%	4.3191E+19 $\pm$ 0.96%
106.20	3.9055E+18 $\pm$ 2.65%	5.1119E+18 $\pm$ 2.73%	6.1390E+18 $\pm$ 2.52%	2.9515E+19 $\pm$ 1.36%	7.6033E+16 $\pm$ 5.43%	4.4747E+19 $\pm$ 1.11%
181.20	3.7473E+18 $\pm$ 2.11%	4.9741E+18 $\pm$ 2.08%	6.2410E+18 $\pm$ 1.86%	3.0181E+19 $\pm$ 1.01%	7.0822E+16 $\pm$ 3.88%	4.5214E+19 $\pm$ 0.84%
281.20	3.3256E+18 $\pm$ 2.22%	4.7575E+18 $\pm$ 2.18%	6.0007E+18 $\pm$ 1.95%	2.8693E+19 $\pm$ 1.02%	7.1157E+16 $\pm$ 3.93%	4.2848E+19 $\pm$ 0.86%

Table E-101. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 Upper Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1225.00	b	1.3020E+16 $\pm$ 17.00%	1.3524E+16 $\pm$ 19.20%	5.1648E+16 $\pm$ 12.14%	3.7315E+15 $\pm$ 27.47%	8.6246E+16 $\pm$ 9.15%
775.00	1.3904E+16 $\pm$ 23.36%	6.3770E+16 $\pm$ 15.08%	6.4625E+16 $\pm$ 18.63%	2.6925E+17 $\pm$ 10.47%	b	4.3240E+17 $\pm$ 7.97%
525.00	2.5844E+16 $\pm$ 22.50%	1.2650E+17 $\pm$ 12.12%	1.5079E+17 $\pm$ 8.58%	6.4863E+17 $\pm$ 5.40%	4.8096E+16 $\pm$ 15.67%	9.9986E+17 $\pm$ 4.32%
300.00	4.4380E+16 $\pm$ 15.44%	2.8797E+17 $\pm$ 7.38%	4.1459E+17 $\pm$ 6.29%	2.1191E+18 $\pm$ 3.93%	1.3253E+17 $\pm$ 9.68%	2.9985E+18 $\pm$ 3.12%
100.00	1.3042E+17 $\pm$ 9.48%	6.8952E+17 $\pm$ 5.62%	9.9936E+17 $\pm$ 4.97%	5.9106E+18 $\pm$ 2.03%	3.5738E+17 $\pm$ 5.24%	8.0873E+18 $\pm$ 1.74%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-102. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Slant Tube SH-2 Upper Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
1225.00	4.1804E+15 $\pm$ 27.08%	1.0780E+16 $\pm$ 14.71%	1.3043E+16 $\pm$ 10.94%	4.5854E+16 $\pm$ 10.73%	4.2705E+15 $\pm$ 21.31%	7.8128E+16 $\pm$ 7.67%
775.00	1.4398E+16 $\pm$ 25.03%	6.4779E+16 $\pm$ 13.68%	6.4595E+16 $\pm$ 13.71%	2.2063E+17 $\pm$ 7.27%	1.8120E+16 $\pm$ 18.92%	3.8253E+17 $\pm$ 5.77%
525.00	2.7264E+16 $\pm$ 18.09%	1.1413E+17 $\pm$ 9.25%	1.4315E+17 $\pm$ 7.71%	6.2657E+17 $\pm$ 4.35%	4.8503E+16 $\pm$ 12.33%	9.5961E+17 $\pm$ 3.52%
300.00	5.5956E+16 $\pm$ 13.80%	3.4501E+17 $\pm$ 6.75%	3.8716E+17 $\pm$ 5.48%	1.9523E+18 $\pm$ 2.96%	1.4189E+17 $\pm$ 7.30%	2.8823E+18 $\pm$ 2.43%
100.00	1.3264E+17 $\pm$ 7.78%	6.9297E+17 $\pm$ 4.58%	9.0058E+17 $\pm$ 3.61%	5.5993E+18 $\pm$ 1.73%	3.9385E+17 $\pm$ 4.13%	7.7194E+18 $\pm$ 1.46%

Table E-103. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	$2.1772\text{E}+16 \pm 17.45\%$	$3.5720\text{E}+16 \pm 11.68\%$	$5.2144\text{E}+16 \pm 8.15\%$	$1.8483\text{E}+17 \pm 5.57\%$	$2.1738\text{E}+16 \pm 12.06\%$	$3.1621\text{E}+17 \pm 4.30\%$
304.80	$1.5933\text{E}+16 \pm 14.61\%$	$4.4374\text{E}+16 \pm 9.74\%$	$5.6340\text{E}+16 \pm 5.82\%$	$2.3581\text{E}+17 \pm 5.33\%$	$1.7792\text{E}+16 \pm 12.26\%$	$3.7025\text{E}+17 \pm 3.94\%$
504.80	$1.6210\text{E}+16 \pm 20.23\%$	$4.1756\text{E}+16 \pm 11.41\%$	$5.4900\text{E}+16 \pm 6.92\%$	$2.1133\text{E}+17 \pm 6.05\%$	$1.5368\text{E}+16 \pm 20.90\%$	$3.3956\text{E}+17 \pm 4.57\%$
754.80	$1.4341\text{E}+16 \pm 19.56\%$	$3.5587\text{E}+16 \pm 11.33\%$	$4.1456\text{E}+16 \pm 7.12\%$	$1.4383\text{E}+17 \pm 5.74\%$	$1.0642\text{E}+16 \pm 11.86\%$	$2.4585\text{E}+17 \pm 4.42\%$
1104.80	$6.9929\text{E}+15 \pm 17.91\%$	$2.1879\text{E}+16 \pm 11.19\%$	$2.7965\text{E}+16 \pm 6.36\%$	$8.1434\text{E}+16 \pm 5.62\%$	$8.4631\text{E}+15 \pm 18.68\%$	$1.4673\text{E}+17 \pm 4.46\%$
1554.80	$4.8588\text{E}+15 \pm 17.87\%$	$9.9177\text{E}+15 \pm 14.51\%$	$1.7747\text{E}+16 \pm 7.83\%$	$4.9322\text{E}+16 \pm 7.60\%$	$4.7961\text{E}+15 \pm 18.46\%$	$8.6642\text{E}+16 \pm 5.44\%$
1902.40	b	b	$6.6673\text{E}+15 \pm 14.73\%$	$2.8530\text{E}+16 \pm 14.69\%$	$1.7510\text{E}+15 \pm 28.28\%$	$4.5896\text{E}+16 \pm 11.14\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-104. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	b	$1.7630\text{E}+16 \pm 27.96\%$	$4.9794\text{E}+16 \pm 13.72\%$	$1.5839\text{E}+17 \pm 12.19\%$	b	$2.6085\text{E}+17 \pm 8.81\%$
304.80	b	$4.1028\text{E}+16 \pm 21.63\%$	$5.3250\text{E}+16 \pm 13.66\%$	$2.0194\text{E}+17 \pm 12.90\%$	b	$3.1839\text{E}+17 \pm 9.15\%$
504.80	b	$4.2129\text{E}+16 \pm 22.75\%$	$5.4736\text{E}+16 \pm 15.43\%$	$2.0496\text{E}+17 \pm 10.68\%$	b	$3.2726\text{E}+17 \pm 8.16\%$
754.80	b	$3.1779\text{E}+16 \pm 19.44\%$	$4.4264\text{E}+16 \pm 13.43\%$	$1.0001\text{E}+17 \pm 10.53\%$	$1.2298\text{E}+16 \pm 27.29\%$	$2.0007\text{E}+17 \pm 7.45\%$
1104.80	$1.1189\text{E}+16 \pm 27.37\%$	$3.4464\text{E}+16 \pm 23.17\%$	$2.8788\text{E}+16 \pm 12.52\%$	$6.0655\text{E}+16 \pm 12.19\%$	$3.9742\text{E}+15 \pm 26.44\%$	$1.3907\text{E}+17 \pm 8.68\%$
1554.80	b	b	$1.6987\text{E}+16 \pm 15.80\%$	$7.1404\text{E}+16 \pm 15.21\%$	b	$1.1311\text{E}+17 \pm 11.22\%$
1902.40	b	b	$7.3359\text{E}+15 \pm 23.89\%$	$1.7052\text{E}+16 \pm 24.41\%$	b	$4.4797\text{E}+16 \pm 17.77\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-105. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	b	b	$5.0453\text{E}+16 \pm 19.67\%$	$1.5435\text{E}+17 \pm 14.63\%$	$2.9846\text{E}+16 \pm 28.42\%$	$3.0612\text{E}+17 \pm 10.55\%$
304.80	b	$4.5881\text{E}+16 \pm 28.87\%$	$5.9792\text{E}+16 \pm 17.49\%$	$1.9014\text{E}+17 \pm 15.23\%$	b	$3.3432\text{E}+17 \pm 10.53\%$
504.80	b	b	$5.9141\text{E}+16 \pm 20.56\%$	$2.1228\text{E}+17 \pm 13.59\%$	b	$3.2816\text{E}+17 \pm 11.27\%$
754.80	b	$3.1146\text{E}+16 \pm 28.48\%$	$2.8328\text{E}+16 \pm 15.77\%$	$1.5679\text{E}+17 \pm 17.53\%$	$2.8063\text{E}+15 \pm 15.04\%$	$2.3357\text{E}+17 \pm 12.92\%$
1104.80	b	$3.5065\text{E}+16 \pm 29.03\%$	$3.2957\text{E}+16 \pm 19.77\%$	$9.8282\text{E}+16 \pm 15.21\%$	b	$1.9028\text{E}+17 \pm 11.11\%$
1554.80	b	b	$1.6867\text{E}+16 \pm 27.64\%$	$4.2488\text{E}+16 \pm 17.87\%$	b	$8.0022\text{E}+16 \pm 13.82\%$
1902.40	a	b	$3.8000\text{E}+15 \pm 13.41\%$	b	b	$3.7095\text{E}+16 \pm 25.51\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-106. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	b	$5.1384\text{E}+16 \pm 28.46\%$	$6.1040\text{E}+16 \pm 23.54\%$	$1.9756\text{E}+17 \pm 16.19\%$	b	$3.6609\text{E}+17 \pm 11.71\%$
304.80	b	$4.1191\text{E}+16 \pm 27.83\%$	$6.3366\text{E}+16 \pm 18.00\%$	$2.0761\text{E}+17 \pm 14.24\%$	b	$3.3582\text{E}+17 \pm 10.37\%$
504.80	b	b	$4.6203\text{E}+16 \pm 17.64\%$	$1.7809\text{E}+17 \pm 18.22\%$	b	$2.9772\text{E}+17 \pm 13.25\%$
754.80	b	$4.1919\text{E}+16 \pm 27.44\%$	$5.5615\text{E}+16 \pm 17.90\%$	$1.3037\text{E}+17 \pm 12.85\%$	b	$2.4991\text{E}+17 \pm 11.05\%$
1104.80	b	b	$2.9520\text{E}+16 \pm 18.12\%$	$7.6687\text{E}+16 \pm 14.45\%$	b	$1.3981\text{E}+17 \pm 10.93\%$
1554.80	b	$1.5367\text{E}+16 \pm 28.56\%$	$1.5423\text{E}+16 \pm 17.45\%$	b	b	$1.1983\text{E}+17 \pm 21.93\%$
1902.40	a	a	b	$2.9629\text{E}+16 \pm 27.75\%$	b	$4.4159\text{E}+16 \pm 27.68\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-107. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	b	$4.4130\text{E}+16 \pm 29.45\%$	$4.3726\text{E}+16 \pm 20.28\%$	$2.0835\text{E}+17 \pm 14.76\%$	b	$3.2077\text{E}+17 \pm 11.14\%$
304.80	b	$5.7753\text{E}+16 \pm 25.40\%$	$5.8308\text{E}+16 \pm 22.54\%$	$2.1970\text{E}+17 \pm 17.74\%$	b	$4.1114\text{E}+17 \pm 11.54\%$
504.80	b	b	$5.2154\text{E}+16 \pm 22.13\%$	$1.5652\text{E}+17 \pm 13.24\%$	b	$2.9070\text{E}+17 \pm 10.70\%$
754.80	b	$7.5681\text{E}+16 \pm 22.90\%$	$4.9185\text{E}+16 \pm 20.86\%$	$1.4880\text{E}+17 \pm 15.50\%$	b	$2.8341\text{E}+17 \pm 10.94\%$
1104.80	b	$2.3372\text{E}+16 \pm 28.03\%$	$2.6983\text{E}+16 \pm 18.19\%$	$6.6698\text{E}+16 \pm 15.46\%$	b	$1.3616\text{E}+17 \pm 10.53\%$
1554.80	b	b	$1.4417\text{E}+16 \pm 16.70\%$	$4.5805\text{E}+16 \pm 20.40\%$	b	$7.7924\text{E}+16 \pm 14.13\%$
1902.40	a	b	b	b	b	$5.0956\text{E}+16 \pm 24.44\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-108. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-1 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
102.40	b	b	$4.5310\text{E}+16 \pm 18.38\%$	$1.4220\text{E}+17 \pm 14.08\%$	b	$2.7018\text{E}+17 \pm 12.15\%$
304.80	b	b	$8.0130\text{E}+16 \pm 17.05\%$	$2.0970\text{E}+17 \pm 12.56\%$	b	$3.7885\text{E}+17 \pm 9.66\%$
504.80	b	$7.7228\text{E}+16 \pm 25.31\%$	$6.4759\text{E}+16 \pm 22.32\%$	$2.5021\text{E}+17 \pm 16.60\%$	b	$4.3483\text{E}+17 \pm 11.49\%$
754.80	b	b	$4.4159\text{E}+16 \pm 15.86\%$	$1.5062\text{E}+17 \pm 13.86\%$	b	$2.2614\text{E}+17 \pm 10.28\%$
1104.80	b	$2.3133\text{E}+16 \pm 28.56\%$	$3.0641\text{E}+16 \pm 20.18\%$	$7.9183\text{E}+16 \pm 15.78\%$	b	$1.5507\text{E}+17 \pm 11.82\%$
1554.80	b	b	$1.6604\text{E}+16 \pm 20.61\%$	$4.4165\text{E}+16 \pm 21.29\%$	b	$7.3921\text{E}+16 \pm 15.51\%$
1902.40	a	a	b	b	b	$4.6954\text{E}+16 \pm 25.29\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-109. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	$5.0937\text{E}+15 \pm 25.66\%$	$1.7916\text{E}+16 \pm 16.62\%$	$1.7449\text{E}+16 \pm 15.65\%$	$4.3582\text{E}+16 \pm 10.28\%$	$3.9995\text{E}+15 \pm 20.59\%$	$8.8041\text{E}+16 \pm 7.61\%$
300.00	b	$7.2435\text{E}+15 \pm 20.82\%$	$8.9230\text{E}+15 \pm 9.57\%$	$2.7609\text{E}+16 \pm 11.17\%$	$2.2812\text{E}+15 \pm 20.33\%$	$4.9068\text{E}+16 \pm 8.18\%$
445.00	b	b	$8.8445\text{E}+15 \pm 25.89\%$	$2.7722\text{E}+16 \pm 15.62\%$	b	$4.6734\text{E}+16 \pm 12.44\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-110. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$2.5580\text{E}+16 \pm 22.44\%$	$3.3194\text{E}+16 \pm 24.40\%$	b	$7.2078\text{E}+16 \pm 16.11\%$
300.00	b	b	$1.6169\text{E}+16 \pm 29.79\%$	$2.0223\text{E}+16 \pm 27.48\%$	b	$5.0962\text{E}+16 \pm 17.25\%$
445.00	b	b	$7.9862\text{E}+15 \pm 29.91\%$	b	b	$6.3870\text{E}+16 \pm 24.13\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-111. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$1.6662\text{E}+16 \pm 27.72\%$	b	b	$7.8594\text{E}+16 \pm 24.27\%$
300.00	a	b	$5.3421\text{E}+15 \pm 12.45\%$	$1.5064\text{E}+16 \pm 25.91\%$	$5.7831\text{E}+14 \pm 27.89\%$	$2.8128\text{E}+16 \pm 23.54\%$
445.00	a	a	$5.0407\text{E}+15 \pm 16.67\%$	b	b	b

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-112. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	b	$2.1320\text{E}+16 \pm 28.79\%$	b	$6.2201\text{E}+16 \pm 20.61\%$
300.00	a	b	$9.3367\text{E}+15 \pm 26.25\%$	b	b	$4.7279\text{E}+16 \pm 23.53\%$
445.00	a	b	$3.2328\text{E}+15 \pm 18.78\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-113. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$8.9696\text{E}+15 \pm 8.61\%$	b	b	b
300.00	a	b	$5.5296\text{E}+15 \pm 11.34\%$	b	b	b
445.00	a	a	$2.1467\text{E}+15 \pm 23.33\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-114. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-2 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$7.9476\text{E}+15 \pm 8.84\%$	b	b	$9.1338\text{E}+16 \pm 26.55\%$
300.00	a	b	b	b	b	$4.4937\text{E}+16 \pm 23.39\%$
445.00	a	a	$3.6430\text{E}+15 \pm 17.37\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-115. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	$1.7048\text{E}+16 \pm 19.88\%$	$3.0919\text{E}+16 \pm 12.35\%$	$3.1912\text{E}+16 \pm 8.53\%$	$9.0322\text{E}+16 \pm 8.51\%$	$1.1825\text{E}+16 \pm 15.08\%$	$1.8203\text{E}+17 \pm 5.65\%$
300.00	$9.5062\text{E}+15 \pm 27.62\%$	$1.9354\text{E}+16 \pm 14.31\%$	$2.1240\text{E}+16 \pm 8.46\%$	$5.0794\text{E}+16 \pm 9.03\%$	$5.9896\text{E}+15 \pm 21.10\%$	$1.0688\text{E}+17 \pm 6.29\%$
500.00	$7.3523\text{E}+15 \pm 24.29\%$	$1.1991\text{E}+16 \pm 21.35\%$	$1.0179\text{E}+16 \pm 13.89\%$	$3.9001\text{E}+16 \pm 15.09\%$	$3.3048\text{E}+15 \pm 21.88\%$	$7.1828\text{E}+16 \pm 9.88\%$
680.00	b	$7.6811\text{E}+15 \pm 22.26\%$	$6.3167\text{E}+15 \pm 10.40\%$	$2.8457\text{E}+16 \pm 13.37\%$	$1.8982\text{E}+15 \pm 26.90\%$	$4.6367\text{E}+16 \pm 9.59\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-116. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	$4.6902\text{E}+16 \pm 23.83\%$	$2.8302\text{E}+16 \pm 13.04\%$	$8.1904\text{E}+16 \pm 19.48\%$	b	$1.9202\text{E}+17 \pm 14.23\%$
300.00	b	$2.3969\text{E}+16 \pm 26.86\%$	$1.6197\text{E}+16 \pm 16.98\%$	$3.6280\text{E}+16 \pm 22.73\%$	b	$8.6752\text{E}+16 \pm 13.32\%$
500.00	b	b	$8.4449\text{E}+15 \pm 18.82\%$	$2.7941\text{E}+16 \pm 24.06\%$	b	$5.3160\text{E}+16 \pm 18.89\%$
680.00	b	b	$7.6701\text{E}+15 \pm 26.66\%$	b	b	$3.9534\text{E}+16 \pm 22.83\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-117. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$3.1063\text{E}+16 \pm 23.87\%$	b	b	$1.6281\text{E}+17 \pm 21.34\%$
300.00	b	b	$1.4265\text{E}+16 \pm 22.13\%$	b	b	$1.0267\text{E}+17 \pm 21.21\%$
500.00	b	a	b	b	b	$6.0427\text{E}+16 \pm 25.49\%$
680.00	b	b	b	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-118. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$3.3480\text{E}+16 \pm 28.08\%$	$6.4939\text{E}+16 \pm 20.92\%$	b	$1.3875\text{E}+17 \pm 14.70\%$
300.00	a	b	$1.9416\text{E}+16 \pm 25.05\%$	$3.8784\text{E}+16 \pm 27.46\%$	b	$9.0904\text{E}+16 \pm 17.42\%$
500.00	b	b	b	$5.9041\text{E}+16 \pm 29.17\%$	$6.1054\text{E}+14 \pm 27.82\%$	$9.9734\text{E}+16 \pm 20.85\%$
680.00	a	b	$3.7012\text{E}+15 \pm 18.21\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-119. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$2.9894\text{E}+16 \pm 22.96\%$	$6.5652\text{E}+16 \pm 22.41\%$	b	$1.6207\text{E}+17 \pm 14.73\%$
300.00	a	b	$1.4509\text{E}+16 \pm 16.02\%$	b	b	$9.3427\text{E}+16 \pm 21.53\%$
500.00	a	a	b	b	b	$6.9755\text{E}+16 \pm 28.81\%$
680.00	a	b	$3.6653\text{E}+15 \pm 15.31\%$	$1.5556\text{E}+16 \pm 29.67\%$	b	$3.5676\text{E}+16 \pm 28.85\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-120. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-3 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	b	$1.1579\text{E}+17 \pm 21.00\%$	b	$1.9448\text{E}+17 \pm 16.20\%$
300.00	b	b	$1.3196\text{E}+16 \pm 22.19\%$	$2.9031\text{E}+16 \pm 25.62\%$	b	$6.8865\text{E}+16 \pm 20.22\%$
500.00	b	b	$5.2114\text{E}+15 \pm 11.05\%$	b	b	$8.4732\text{E}+16 \pm 26.73\%$
680.00	a	a	$5.2845\text{E}+15 \pm 11.34\%$	b	b	$3.3290\text{E}+16 \pm 26.98\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-121. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	$1.3512\text{E}+16 \pm 20.44\%$	$3.4479\text{E}+16 \pm 14.37\%$	$3.0974\text{E}+16 \pm 8.23\%$	$9.7149\text{E}+16 \pm 7.47\%$	$1.2701\text{E}+16 \pm 14.14\%$	$1.8882\text{E}+17 \pm 5.39\%$
300.00	$5.8550\text{E}+15 \pm 22.52\%$	$1.8224\text{E}+16 \pm 15.20\%$	$1.7510\text{E}+16 \pm 6.80\%$	$6.4603\text{E}+16 \pm 8.92\%$	$5.1237\text{E}+15 \pm 16.68\%$	$1.1132\text{E}+17 \pm 6.51\%$
500.00	$3.5786\text{E}+15 \pm 28.01\%$	$1.1599\text{E}+16 \pm 20.59\%$	$1.2665\text{E}+16 \pm 15.80\%$	$3.3844\text{E}+16 \pm 11.19\%$	$3.8262\text{E}+15 \pm 19.34\%$	$6.5513\text{E}+16 \pm 8.51\%$
680.00	b	$6.9492\text{E}+15 \pm 24.73\%$	$6.8584\text{E}+15 \pm 11.51\%$	$2.5525\text{E}+16 \pm 13.14\%$	$2.0957\text{E}+15 \pm 23.71\%$	$4.3531\text{E}+16 \pm 9.36\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-122. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	$2.9610\text{E}+16 \pm 25.74\%$	$2.4768\text{E}+16 \pm 11.81\%$	$1.1366\text{E}+17 \pm 19.94\%$	b	$1.8713\text{E}+17 \pm 13.42\%$
300.00	b	b	$1.5935\text{E}+16 \pm 12.77\%$	$5.0899\text{E}+16 \pm 17.32\%$	b	$1.0243\text{E}+17 \pm 14.73\%$
500.00	b	b	$9.5957\text{E}+15 \pm 22.66\%$	$1.9252\text{E}+16 \pm 26.37\%$	b	$4.3076\text{E}+16 \pm 17.20\%$
680.00	a	a	b	$2.9782\text{E}+16 \pm 29.45\%$	b	$4.3332\text{E}+16 \pm 22.70\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-123. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$2.1661\text{E}+16 \pm 16.24\%$	$8.4658\text{E}+16 \pm 24.42\%$	b	$1.5516\text{E}+17 \pm 16.37\%$
300.00	b	b	b	$8.8941\text{E}+16 \pm 26.00\%$	$5.4865\text{E}+14 \pm 28.69\%$	$1.4739\text{E}+17 \pm 22.12\%$
500.00	a	b	b	$3.0287\text{E}+16 \pm 27.65\%$	b	$5.2403\text{E}+16 \pm 22.05\%$
680.00	b	a	b	b	b	$6.7411\text{E}+16 \pm 28.16\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-124. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$2.2893\text{E}+16 \pm 15.93\%$	$1.0017\text{E}+17 \pm 25.86\%$	b	$1.6637\text{E}+17 \pm 17.22\%$
300.00	a	b	b	$7.0439\text{E}+16 \pm 28.75\%$	b	$1.1951\text{E}+17 \pm 22.50\%$
500.00	a	b	$6.0864\text{E}+15 \pm 13.58\%$	$4.8567\text{E}+16 \pm 27.19\%$	b	$7.1227\text{E}+16 \pm 21.92\%$
680.00	a	a	$2.2650\text{E}+15 \pm 15.80\%$	b	b	b

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-125. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$1.8261\text{E}+16 \pm 8.60\%$	b	b	$1.7215\text{E}+17 \pm 20.16\%$
300.00	a	b	$2.2406\text{E}+16 \pm 24.20\%$	b	$7.2068\text{E}+14 \pm 25.52\%$	$8.7078\text{E}+16 \pm 24.98\%$
500.00	a	b	$5.2443\text{E}+15 \pm 10.85\%$	b	b	b
680.00	a	a	b	b	b	$4.8903\text{E}+16 \pm 28.85\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-126. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-4 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$1.9500\text{E}+16 \pm 14.29\%$	$8.8483\text{E}+16 \pm 19.16\%$	b	$1.8881\text{E}+17 \pm 14.72\%$
300.00	a	b	$1.2168\text{E}+16 \pm 19.23\%$	b	b	$1.1589\text{E}+17 \pm 23.38\%$
500.00	a	b	b	b	b	$8.7990\text{E}+16 \pm 26.91\%$
680.00	a	a	b	b	b	$3.7890\text{E}+16 \pm 29.15\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-127. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	$6.1894\text{E}+15 \pm 29.97\%$	$2.2316\text{E}+16 \pm 14.93\%$	$1.5610\text{E}+16 \pm 7.04\%$	$5.4662\text{E}+16 \pm 8.39\%$	$6.0060\text{E}+15 \pm 16.98\%$	$1.0478\text{E}+17 \pm 6.34\%$
300.00	b	$9.7811\text{E}+15 \pm 19.85\%$	$9.8046\text{E}+15 \pm 11.36\%$	$3.6663\text{E}+16 \pm 10.71\%$	$3.4812\text{E}+15 \pm 19.10\%$	$6.2538\text{E}+16 \pm 7.75\%$
445.00	b	b	$5.4270\text{E}+15 \pm 10.13\%$	$2.5371\text{E}+16 \pm 14.22\%$	$6.8814\text{E}+14 \pm 12.38\%$	$3.7898\text{E}+16 \pm 11.16\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-128. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$2.1980\text{E}+16 \pm 27.84\%$	$7.4912\text{E}+16 \pm 18.66\%$	b	$1.2742\text{E}+17 \pm 14.51\%$
300.00	b	b	b	$3.6210\text{E}+16 \pm 26.23\%$	b	$6.2527\text{E}+16 \pm 19.27\%$
445.00	a	a	$5.9119\text{E}+15 \pm 17.92\%$	b	b	$4.2238\text{E}+16 \pm 28.07\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-129. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 1. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	b	b	$1.2743\text{E}+16 \pm 26.92\%$	$5.5343\text{E}+16 \pm 28.11\%$	b	$9.8113\text{E}+16 \pm 20.33\%$
300.00	a	a	b	$4.7260\text{E}+16 \pm 24.53\%$	b	$7.5901\text{E}+16 \pm 23.97\%$
445.00	a	a	b	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-130. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 2. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$8.7884\text{E}+15 \pm 8.54\%$	$4.2528\text{E}+16 \pm 23.55\%$	b	$5.6621\text{E}+16 \pm 18.45\%$
300.00	b	b	$5.6614\text{E}+15 \pm 11.01\%$	$4.6048\text{E}+16 \pm 26.90\%$	b	$7.0648\text{E}+16 \pm 22.20\%$
445.00	a	b	$3.3852\text{E}+15 \pm 17.32\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-131. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 3. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	b	$5.1418\text{E}+16 \pm 28.27\%$	b	$1.0970\text{E}+17 \pm 20.17\%$
300.00	b	b	$8.0115\text{E}+15 \pm 22.40\%$	$1.7814\text{E}+16 \pm 26.94\%$	b	$3.8955\text{E}+16 \pm 22.28\%$
445.00	a	a	b	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-132. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Tube PT-5 Air Tube 4. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.00	a	b	$1.3638\text{E}+16 \pm 17.06\%$	$4.6925\text{E}+16 \pm 24.69\%$	b	$9.5813\text{E}+16 \pm 21.54\%$
300.00	b	a	b	b	b	$6.3794\text{E}+16 \pm 23.94\%$
445.00	b	a	$3.2565\text{E}+15 \pm 18.00\%$	b	b	b

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-133. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Facility PF-1 Outer Shell. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
149.40	$5.8410\text{E}+15 \pm 26.79\%$	$1.8678\text{E}+16 \pm 16.36\%$	$4.9458\text{E}+16 \pm 10.71\%$	$1.2759\text{E}+17 \pm 8.61\%$	$7.0601\text{E}+15 \pm 26.40\%$	$2.0863\text{E}+17 \pm 6.47\%$
448.80	b	$1.6164\text{E}+16 \pm 18.67\%$	$4.7055\text{E}+16 \pm 11.55\%$	$8.3042\text{E}+16 \pm 8.14\%$	$2.9059\text{E}+15 \pm 26.23\%$	$1.5503\text{E}+17 \pm 6.43\%$
798.80	$7.3113\text{E}+15 \pm 27.82\%$	$1.4187\text{E}+16 \pm 17.12\%$	$3.6116\text{E}+16 \pm 14.14\%$	$6.6368\text{E}+16 \pm 10.37\%$	$2.4514\text{E}+15 \pm 26.29\%$	$1.2643\text{E}+17 \pm 7.58\%$
1248.80	b	$6.4262\text{E}+15 \pm 23.20\%$	$1.6883\text{E}+16 \pm 16.39\%$	$3.6956\text{E}+16 \pm 10.36\%$	$3.0214\text{E}+15 \pm 29.09\%$	$6.6620\text{E}+16 \pm 8.20\%$
2024.20	b	b	$2.1669\text{E}+15 \pm 18.84\%$	$9.2938\text{E}+15 \pm 21.57\%$	$3.6431\text{E}+14 \pm 27.90\%$	$1.3052\text{E}+16 \pm 17.54\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-134. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Pneumatic Facility PF-1 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
149.40	b	b	$2.6817\text{E}+16 \pm 24.02\%$	$1.0656\text{E}+17 \pm 16.34\%$	b	$1.6308\text{E}+17 \pm 12.79\%$
448.80	a	b	$3.3468\text{E}+16 \pm 26.19\%$	$6.9122\text{E}+16 \pm 19.03\%$	$1.2820\text{E}+15 \pm 20.97\%$	$1.3705\text{E}+17 \pm 15.50\%$
798.80	b	b	b	$5.6255\text{E}+16 \pm 19.04\%$	b	$1.1626\text{E}+17 \pm 19.34\%$
1248.80	b	b	b	b	b	$7.6433\text{E}+16 \pm 22.78\%$
2024.20	a	a	$5.9791\text{E}+14 \pm 15.58\%$	$6.1181\text{E}+15 \pm 29.56\%$	b	$6.8324\text{E}+15 \pm 26.52\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-135. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Facility PF-2 Outer Shell. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
150.60	$8.1941\text{E}+15 \pm 23.67\%$	$1.5795\text{E}+16 \pm 24.15\%$	$3.8828\text{E}+16 \pm 10.75\%$	$1.0303\text{E}+17 \pm 8.48\%$	$4.8844\text{E}+15 \pm 20.02\%$	$1.7073\text{E}+17 \pm 6.50\%$
451.20	b	$1.3221\text{E}+16 \pm 18.12\%$	$3.8624\text{E}+16 \pm 12.11\%$	$9.3071\text{E}+16 \pm 9.32\%$	$4.5736\text{E}+15 \pm 29.92\%$	$1.5274\text{E}+17 \pm 7.11\%$
801.20	b	$1.0563\text{E}+16 \pm 17.92\%$	$2.5080\text{E}+16 \pm 11.93\%$	$7.3930\text{E}+16 \pm 11.58\%$	$4.6289\text{E}+15 \pm 25.01\%$	$1.1918\text{E}+17 \pm 8.18\%$
1251.20	b	$5.3517\text{E}+15 \pm 22.21\%$	$1.7354\text{E}+16 \pm 16.43\%$	$3.1438\text{E}+16 \pm 11.37\%$	$4.0946\text{E}+15 \pm 29.41\%$	$6.0824\text{E}+16 \pm 8.85\%$
2046.60	b	b	$2.2844\text{E}+15 \pm 24.36\%$	$6.7525\text{E}+15 \pm 16.06\%$	b	$1.1028\text{E}+16 \pm 13.16\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-136. Five-group Photon Spectrum (m^2s^{-1}) in the Pneumatic Facility PF-2 Transfer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
150.60	b	b	b	$1.0932\text{E}+17 \pm 18.58\%$	b	$1.7172\text{E}+17 \pm 15.48\%$
451.20	b	b	$5.6143\text{E}+16 \pm 29.38\%$	$6.1737\text{E}+16 \pm 20.15\%$	$1.1995\text{E}+15 \pm 23.56\%$	$1.5263\text{E}+17 \pm 16.49\%$
801.20	b	b	$3.1243\text{E}+16 \pm 25.25\%$	$4.4389\text{E}+16 \pm 22.22\%$	b	$9.0537\text{E}+16 \pm 15.36\%$
1251.20	a	b	b	b	b	$4.6115\text{E}+16 \pm 21.63\%$
2046.60	a	b	b	b	b	b

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-137. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-1 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	3.0620E+16 $\pm$ 18.29%	8.5339E+16 $\pm$ 9.69%	8.6366E+16 $\pm$ 5.86%	2.6008E+17 $\pm$ 6.05%	2.3415E+16 $\pm$ 12.01%	4.8582E+17 $\pm$ 4.21%
300.38	4.2130E+16 $\pm$ 12.74%	8.4697E+16 $\pm$ 9.14%	1.0834E+17 $\pm$ 5.79%	3.3160E+17 $\pm$ 6.17%	3.2984E+16 $\pm$ 12.93%	5.9975E+17 $\pm$ 4.12%
500.38	4.0679E+16 $\pm$ 14.36%	1.0007E+17 $\pm$ 9.29%	1.0567E+17 $\pm$ 5.55%	3.5734E+17 $\pm$ 5.03%	2.2143E+16 $\pm$ 10.73%	6.2591E+17 $\pm$ 3.76%
700.38	3.2171E+16 $\pm$ 14.83%	1.0215E+17 $\pm$ 8.94%	1.0079E+17 $\pm$ 6.27%	2.9383E+17 $\pm$ 5.95%	2.2340E+16 $\pm$ 11.85%	5.5128E+17 $\pm$ 4.08%
900.38	2.7602E+16 $\pm$ 15.88%	6.0833E+16 $\pm$ 10.22%	8.5269E+16 $\pm$ 6.41%	2.4999E+17 $\pm$ 9.17%	1.5805E+16 $\pm$ 14.68%	4.3950E+17 $\pm$ 5.85%
1150.38	2.3968E+16 $\pm$ 12.91%	7.4080E+16 $\pm$ 9.27%	7.0572E+16 $\pm$ 4.56%	1.7389E+17 $\pm$ 7.09%	1.0033E+16 $\pm$ 15.52%	3.5254E+17 $\pm$ 4.48%
1450.38	2.1336E+16 $\pm$ 16.14%	4.9409E+16 $\pm$ 14.51%	5.2879E+16 $\pm$ 5.62%	1.1482E+17 $\pm$ 8.81%	8.2838E+15 $\pm$ 15.95%	2.4673E+17 $\pm$ 5.58%
1750.38	9.8203E+15 $\pm$ 19.25%	2.4266E+16 $\pm$ 13.27%	3.0712E+16 $\pm$ 6.23%	5.8418E+16 $\pm$ 9.85%	3.5804E+15 $\pm$ 29.37%	1.2680E+17 $\pm$ 6.04%
2135.19	5.6783E+15 $\pm$ 23.52%	1.5680E+16 $\pm$ 17.47%	1.2352E+16 $\pm$ 7.74%	3.2679E+16 $\pm$ 13.27%	1.7446E+15 $\pm$ 28.17%	6.8134E+16 $\pm$ 8.14%

Table E-138. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-1 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	2.4430E+16 $\pm$ 21.89%	1.0093E+17 $\pm$ 13.37%	1.0729E+17 $\pm$ 8.90%	2.6498E+17 $\pm$ 7.67%	1.8291E+16 $\pm$ 16.66%	5.1593E+17 $\pm$ 5.49%
300.38	4.9644E+16 $\pm$ 18.27%	8.1767E+16 $\pm$ 12.15%	1.0262E+17 $\pm$ 5.68%	3.1941E+17 $\pm$ 6.66%	2.0854E+16 $\pm$ 15.54%	5.7430E+17 $\pm$ 4.71%
500.38	4.5555E+16 $\pm$ 17.22%	1.0097E+17 $\pm$ 10.17%	1.1817E+17 $\pm$ 6.54%	3.7578E+17 $\pm$ 6.24%	1.7840E+16 $\pm$ 17.69%	6.5832E+17 $\pm$ 4.43%
700.38	3.9499E+16 $\pm$ 17.80%	1.0816E+17 $\pm$ 10.27%	1.0180E+17 $\pm$ 5.76%	2.8236E+17 $\pm$ 6.88%	1.5027E+16 $\pm$ 17.80%	5.4684E+17 $\pm$ 4.66%
900.38	2.6262E+16 $\pm$ 19.01%	7.6439E+16 $\pm$ 13.24%	8.7255E+16 $\pm$ 7.86%	2.2049E+17 $\pm$ 7.94%	1.3814E+16 $\pm$ 29.37%	4.2426E+17 $\pm$ 5.47%
1150.38	4.6391E+16 $\pm$ 14.71%	7.4716E+16 $\pm$ 10.34%	9.0780E+16 $\pm$ 7.73%	1.8000E+17 $\pm$ 7.99%	b	4.0102E+17 $\pm$ 5.04%
1450.38	2.4165E+16 $\pm$ 18.00%	5.7806E+16 $\pm$ 12.18%	6.5696E+16 $\pm$ 9.18%	1.1020E+17 $\pm$ 10.06%	3.8598E+15 $\pm$ 24.81%	2.6173E+17 $\pm$ 6.07%
1750.38	1.1753E+16 $\pm$ 25.34%	3.7876E+16 $\pm$ 16.62%	4.2704E+16 $\pm$ 10.17%	5.6164E+16 $\pm$ 12.23%	b	1.5253E+17 $\pm$ 7.53%
2135.19	b	1.7856E+16 $\pm$ 17.93%	1.3528E+16 $\pm$ 10.04%	2.8877E+16 $\pm$ 12.75%	b	6.6033E+16 $\pm$ 8.40%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-139. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-1 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$2.5591\text{E}+16 \pm 24.86\%$	$8.6514\text{E}+16 \pm 15.05\%$	$8.9122\text{E}+16 \pm 8.98\%$	$2.4235\text{E}+17 \pm 12.61\%$	$1.3603\text{E}+16 \pm 29.80\%$	$4.5718\text{E}+17 \pm 7.81\%$
300.38	$4.1249\text{E}+16 \pm 20.21\%$	$7.6982\text{E}+16 \pm 17.01\%$	$1.0456\text{E}+17 \pm 7.81\%$	$3.0158\text{E}+17 \pm 8.50\%$	$1.2145\text{E}+16 \pm 26.80\%$	$5.3652\text{E}+17 \pm 5.97\%$
500.38	$4.4707\text{E}+16 \pm 21.42\%$	$1.1529\text{E}+17 \pm 12.83\%$	$1.1560\text{E}+17 \pm 8.34\%$	$3.3759\text{E}+17 \pm 7.35\%$	$1.4622\text{E}+16 \pm 29.60\%$	$6.2781\text{E}+17 \pm 5.32\%$
700.38	$3.0625\text{E}+16 \pm 24.43\%$	$1.0574\text{E}+17 \pm 14.67\%$	$9.8642\text{E}+16 \pm 10.53\%$	$2.6039\text{E}+17 \pm 10.26\%$	$1.1052\text{E}+16 \pm 29.02\%$	$5.0645\text{E}+17 \pm 6.69\%$
900.38	$2.9285\text{E}+16 \pm 25.00\%$	$7.6187\text{E}+16 \pm 19.63\%$	$7.8828\text{E}+16 \pm 7.36\%$	$2.3446\text{E}+17 \pm 15.48\%$	$8.0640\text{E}+15 \pm 28.69\%$	$4.2682\text{E}+17 \pm 9.59\%$
1150.38	$3.6407\text{E}+16 \pm 20.13\%$	$6.8741\text{E}+16 \pm 15.25\%$	$8.0443\text{E}+16 \pm 6.57\%$	$1.6324\text{E}+17 \pm 10.16\%$	b	$3.5562\text{E}+17 \pm 6.20\%$
1450.38	b	$7.2121\text{E}+16 \pm 15.90\%$	$6.5033\text{E}+16 \pm 12.51\%$	$9.4829\text{E}+16 \pm 12.23\%$	b	$2.6455\text{E}+17 \pm 8.34\%$
1750.38	b	$3.0881\text{E}+16 \pm 22.64\%$	$4.2030\text{E}+16 \pm 15.62\%$	$7.0440\text{E}+16 \pm 16.93\%$	b	$1.6201\text{E}+17 \pm 10.50\%$
2135.19	b	$1.1760\text{E}+16 \pm 28.18\%$	$1.5854\text{E}+16 \pm 13.50\%$	$2.9068\text{E}+16 \pm 18.23\%$	b	$6.5908\text{E}+16 \pm 11.02\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-140. Five-group Photon Spectrum ($\text{m}^{-2}\text{s}^{-1}$) in the Vertical Hole VH-1 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	b	$6.2982\text{E}+16 \pm 20.44\%$	$8.7214\text{E}+16 \pm 11.10\%$	$1.5473\text{E}+17 \pm 12.11\%$	$2.0649\text{E}+15 \pm 27.62\%$	$3.4133\text{E}+17 \pm 8.05\%$
300.38	$4.0659\text{E}+16 \pm 23.03\%$	$6.9102\text{E}+16 \pm 20.54\%$	$1.1081\text{E}+17 \pm 9.92\%$	$2.4378\text{E}+17 \pm 10.19\%$	b	$4.6817\text{E}+17 \pm 7.04\%$
500.38	b	$1.2797\text{E}+17 \pm 16.78\%$	$1.0503\text{E}+17 \pm 9.71\%$	$2.6695\text{E}+17 \pm 8.72\%$	$2.5322\text{E}+15 \pm 26.28\%$	$5.4372\text{E}+17 \pm 6.73\%$
700.38	b	$1.1622\text{E}+17 \pm 17.76\%$	$9.0878\text{E}+16 \pm 9.90\%$	$2.0874\text{E}+17 \pm 10.78\%$	b	$4.4605\text{E}+17 \pm 7.52\%$
935.19	$3.4446\text{E}+16 \pm 22.90\%$	b	$7.7588\text{E}+16 \pm 9.55\%$	$1.8198\text{E}+17 \pm 10.52\%$	$1.6473\text{E}+15 \pm 27.17\%$	$4.0174\text{E}+17 \pm 11.03\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-141. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Outer Tube. Normalized to 350 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	4.2562E+16 ± 15.52%	8.4070E+16 ± 9.33%	1.1034E+17 ± 5.82%	3.0792E+17 ± 6.16%	2.3259E+16 ± 14.10%	5.6815E+17 ± 4.19%
300.38	4.8888E+16 ± 12.41%	1.0090E+17 ± 9.34%	1.1217E+17 ± 5.85%	3.8739E+17 ± 4.97%	4.0275E+16 ± 12.00%	6.8962E+17 ± 3.62%
500.38	5.1172E+16 ± 11.77%	8.8442E+16 ± 8.80%	1.0514E+17 ± 5.27%	3.7514E+17 ± 4.75%	2.5988E+16 ± 12.58%	6.4588E+17 ± 3.50%
700.38	3.7328E+16 ± 12.51%	8.5055E+16 ± 10.18%	9.6034E+16 ± 6.49%	3.1194E+17 ± 5.01%	2.2401E+16 ± 12.44%	5.5276E+17 ± 3.69%
900.38	4.4503E+16 ± 14.01%	8.3064E+16 ± 9.84%	8.2397E+16 ± 5.91%	2.4749E+17 ± 6.01%	1.9138E+16 ± 15.25%	4.5660E+17 ± 4.16%
1150.38	2.7596E+16 ± 13.23%	6.9313E+16 ± 9.74%	7.2337E+16 ± 4.95%	1.7312E+17 ± 6.50%	1.9682E+16 ± 16.30%	3.6205E+17 ± 4.24%
1450.38	2.0492E+16 ± 14.20%	5.2933E+16 ± 11.01%	5.2887E+16 ± 6.04%	1.0675E+17 ± 8.13%	1.0253E+16 ± 27.45%	2.4332E+17 ± 5.19%
1750.38	1.0168E+16 ± 18.63%	2.4373E+16 ± 14.49%	3.2081E+16 ± 7.63%	6.5407E+16 ± 11.68%	2.8156E+15 ± 26.80%	1.3485E+17 ± 7.06%
2135.19	b	1.0316E+16 ± 16.24%	1.3044E+16 ± 7.50%	3.7574E+16 ± 11.02%	1.8217E+15 ± 24.48%	6.7640E+16 ± 7.76%
a No particle interactions recorded. b Poor statistics; value not reported.						

Table E-142. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Inner Tube. Normalized to 350 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	5.1786E+16 ± 17.75%	1.0086E+17 ± 14.08%	1.1934E+17 ± 6.59%	2.9488E+17 ± 5.96%	1.5025E+16 ± 18.38%	5.8190E+17 ± 4.91%
300.38	3.8234E+16 ± 15.44%	1.0287E+17 ± 10.73%	1.3150E+17 ± 5.93%	3.5893E+17 ± 5.81%	2.2307E+16 ± 15.62%	6.5384E+17 ± 4.17%
500.38	4.6833E+16 ± 14.42%	1.2728E+17 ± 11.69%	1.2329E+17 ± 6.50%	3.9307E+17 ± 6.13%	1.4105E+16 ± 15.82%	7.0457E+17 ± 4.41%
700.38	4.3600E+16 ± 14.44%	7.6722E+16 ± 13.78%	9.9257E+16 ± 6.00%	3.2342E+17 ± 6.32%	1.0357E+16 ± 18.86%	5.5336E+17 ± 4.67%
900.38	4.6213E+16 ± 19.72%	7.2600E+16 ± 13.01%	8.8498E+16 ± 6.72%	2.3326E+17 ± 7.25%	1.4197E+16 ± 19.11%	4.5477E+17 ± 5.26%
1150.38	3.2393E+16 ± 16.48%	7.6531E+16 ± 9.81%	8.3980E+16 ± 6.11%	1.8192E+17 ± 8.11%	1.0991E+16 ± 17.45%	3.8581E+17 ± 4.93%
1450.38	2.8177E+16 ± 17.31%	5.4324E+16 ± 13.35%	5.5159E+16 ± 6.13%	1.2693E+17 ± 11.58%	5.9668E+15 ± 25.96%	2.7055E+17 ± 6.77%
1750.38	1.7298E+16 ± 20.49%	3.0288E+16 ± 19.02%	3.5127E+16 ± 7.21%	6.6586E+16 ± 12.63%	b	1.5168E+17 ± 8.22%
2135.19	b	1.3975E+16 ± 19.72%	1.5028E+16 ± 8.76%	3.1510E+16 ± 12.83%	b	6.7246E+16 ± 8.42%
a No particle interactions recorded. b Poor statistics; value not reported.						

Table E-143. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$4.2116\text{E}+16 \pm 20.25\%$	$1.0790\text{E}+17 \pm 16.79\%$	$1.1117\text{E}+17 \pm 8.38\%$	$2.3424\text{E}+17 \pm 8.59\%$	$5.6960\text{E}+15 \pm 27.91\%$	$5.0114\text{E}+17 \pm 6.13\%$
300.38	$4.2771\text{E}+16 \pm 24.01\%$	$1.0076\text{E}+17 \pm 18.91\%$	$1.1621\text{E}+17 \pm 8.66\%$	$3.2086\text{E}+17 \pm 8.32\%$	$1.1444\text{E}+16 \pm 27.65\%$	$5.9204\text{E}+17 \pm 6.36\%$
500.38	$5.4176\text{E}+16 \pm 20.78\%$	$1.1115\text{E}+17 \pm 13.73\%$	$1.1694\text{E}+17 \pm 9.22\%$	$3.3963\text{E}+17 \pm 7.07\%$	$1.3727\text{E}+16 \pm 28.30\%$	$6.3562\text{E}+17 \pm 5.29\%$
700.38	$5.2324\text{E}+16 \pm 18.43\%$	$1.1365\text{E}+17 \pm 20.12\%$	$1.0264\text{E}+17 \pm 8.79\%$	$3.0335\text{E}+17 \pm 7.91\%$	$1.0180\text{E}+16 \pm 26.80\%$	$5.8214\text{E}+17 \pm 6.36\%$
900.38	$2.8817\text{E}+16 \pm 24.05\%$	$5.5904\text{E}+16 \pm 21.33\%$	$9.9073\text{E}+16 \pm 9.48\%$	$2.4962\text{E}+17 \pm 10.55\%$	b	$4.4518\text{E}+17 \pm 7.22\%$
1150.38	$3.2630\text{E}+16 \pm 21.75\%$	$7.7078\text{E}+16 \pm 14.05\%$	$8.2789\text{E}+16 \pm 9.95\%$	$1.9048\text{E}+17 \pm 9.91\%$	$5.4041\text{E}+15 \pm 27.75\%$	$3.8838\text{E}+17 \pm 6.39\%$
1450.38	$2.9236\text{E}+16 \pm 24.07\%$	$6.1111\text{E}+16 \pm 19.57\%$	$5.1342\text{E}+16 \pm 7.69\%$	$1.0583\text{E}+17 \pm 12.59\%$	b	$2.5097\text{E}+17 \pm 8.00\%$
1750.38	$1.7228\text{E}+16 \pm 29.43\%$	b	$3.1111\text{E}+16 \pm 7.31\%$	$6.3335\text{E}+16 \pm 16.02\%$	b	$1.3390\text{E}+17 \pm 10.61\%$
2135.19	b	b	$1.5632\text{E}+16 \pm 8.97\%$	$3.2924\text{E}+16 \pm 18.33\%$	b	$7.2557\text{E}+16 \pm 15.38\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-144. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-2 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$4.2980\text{E}+16 \pm 24.36\%$	$1.2094\text{E}+17 \pm 19.80\%$	$1.1475\text{E}+17 \pm 14.23\%$	$2.0532\text{E}+17 \pm 10.38\%$	$1.6499\text{E}+15 \pm 26.98\%$	$4.8564\text{E}+17 \pm 8.16\%$
300.38	$3.8466\text{E}+16 \pm 24.67\%$	$8.5849\text{E}+16 \pm 19.14\%$	$1.2783\text{E}+17 \pm 13.78\%$	$2.6299\text{E}+17 \pm 11.02\%$	b	$5.2049\text{E}+17 \pm 7.61\%$
500.38	$2.9150\text{E}+16 \pm 25.39\%$	$1.0306\text{E}+17 \pm 18.34\%$	$1.1511\text{E}+17 \pm 11.82\%$	$2.8617\text{E}+17 \pm 10.25\%$	$3.7698\text{E}+15 \pm 25.97\%$	$5.3726\text{E}+17 \pm 7.23\%$
700.38	$6.9951\text{E}+16 \pm 27.20\%$	$9.5078\text{E}+16 \pm 24.56\%$	$9.9518\text{E}+16 \pm 11.52\%$	$2.7964\text{E}+17 \pm 11.12\%$	$3.2812\text{E}+15 \pm 27.73\%$	$5.4747\text{E}+17 \pm 8.45\%$
935.19	$4.1970\text{E}+16 \pm 27.85\%$	$5.6599\text{E}+16 \pm 20.50\%$	$1.0011\text{E}+17 \pm 11.23\%$	$1.9102\text{E}+17 \pm 11.15\%$	b	$3.9327\text{E}+17 \pm 7.49\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-145. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	3.2049E+16 $\pm$ 13.98%	9.5790E+16 $\pm$ 9.39%	9.6693E+16 $\pm$ 7.09%	3.1279E+17 $\pm$ 5.99%	2.3592E+16 $\pm$ 13.53%	5.6091E+17 $\pm$ 4.20%
300.38	4.4064E+16 $\pm$ 11.34%	1.1369E+17 $\pm$ 9.96%	1.2598E+17 $\pm$ 5.25%	4.5353E+17 $\pm$ 4.48%	3.7420E+16 $\pm$ 10.56%	7.7469E+17 $\pm$ 3.59%
500.38	5.2757E+16 $\pm$ 11.46%	1.4000E+17 $\pm$ 7.53%	1.4674E+17 $\pm$ 4.72%	5.8155E+17 $\pm$ 3.97%	4.0758E+16 $\pm$ 10.20%	9.6181E+17 $\pm$ 2.97%
700.38	4.9346E+16 $\pm$ 13.87%	1.0958E+17 $\pm$ 7.94%	1.1708E+17 $\pm$ 4.66%	5.3947E+17 $\pm$ 5.07%	3.7598E+16 $\pm$ 9.61%	8.5308E+17 $\pm$ 3.67%
900.38	3.3160E+16 $\pm$ 28.77%	8.6260E+16 $\pm$ 9.38%	9.5861E+16 $\pm$ 7.41%	3.5399E+17 $\pm$ 6.16%	2.9131E+16 $\pm$ 14.24%	5.9840E+17 $\pm$ 4.67%
1150.38	4.0544E+16 $\pm$ 18.93%	6.7953E+16 $\pm$ 8.60%	6.7038E+16 $\pm$ 5.27%	2.0873E+17 $\pm$ 5.49%	1.5381E+16 $\pm$ 13.76%	3.9964E+17 $\pm$ 4.02%
1450.38	1.4049E+16 $\pm$ 16.61%	4.3683E+16 $\pm$ 10.74%	4.6404E+16 $\pm$ 6.32%	1.0280E+17 $\pm$ 6.46%	1.2771E+16 $\pm$ 18.41%	2.1971E+17 $\pm$ 4.52%
1750.38	1.3957E+16 $\pm$ 20.37%	3.0314E+16 $\pm$ 13.20%	2.5129E+16 $\pm$ 7.22%	6.9138E+16 $\pm$ 9.45%	7.2574E+15 $\pm$ 22.97%	1.4580E+17 $\pm$ 6.34%
2135.19	8.6268E+15 $\pm$ 22.45%	9.9710E+15 $\pm$ 18.33%	1.4492E+16 $\pm$ 8.29%	4.1035E+16 $\pm$ 10.78%	2.8192E+15 $\pm$ 22.80%	7.6944E+16 $\pm$ 7.51%

Table E-146. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	2.9374E+16 $\pm$ 17.99%	8.6410E+16 $\pm$ 11.01%	9.9345E+16 $\pm$ 6.18%	2.8674E+17 $\pm$ 6.65%	1.2494E+16 $\pm$ 16.89%	5.1436E+17 $\pm$ 4.62%
300.38	5.8708E+16 $\pm$ 15.33%	1.1832E+17 $\pm$ 10.28%	1.3098E+17 $\pm$ 5.71%	4.3461E+17 $\pm$ 6.02%	2.8719E+16 $\pm$ 28.07%	7.7134E+17 $\pm$ 4.55%
500.38	5.3922E+16 $\pm$ 13.53%	1.4798E+17 $\pm$ 9.75%	1.6334E+17 $\pm$ 6.11%	5.8566E+17 $\pm$ 5.09%	2.6677E+16 $\pm$ 20.83%	9.7759E+17 $\pm$ 3.84%
700.38	4.0947E+16 $\pm$ 15.57%	1.2827E+17 $\pm$ 9.34%	1.3032E+17 $\pm$ 6.29%	4.8342E+17 $\pm$ 6.18%	2.9190E+16 $\pm$ 20.40%	8.1214E+17 $\pm$ 4.48%
900.38	2.2065E+16 $\pm$ 20.20%	1.0662E+17 $\pm$ 12.39%	1.1920E+17 $\pm$ 13.65%	3.4955E+17 $\pm$ 6.82%	1.6296E+16 $\pm$ 18.20%	6.1373E+17 $\pm$ 5.44%
1150.38	3.3904E+16 $\pm$ 14.20%	8.0487E+16 $\pm$ 10.59%	7.4326E+16 $\pm$ 6.80%	2.2271E+17 $\pm$ 7.52%	1.2446E+16 $\pm$ 17.23%	4.2387E+17 $\pm$ 4.92%
1450.38	1.8965E+16 $\pm$ 23.87%	4.6988E+16 $\pm$ 12.72%	5.5826E+16 $\pm$ 7.67%	1.0885E+17 $\pm$ 8.80%	7.7782E+15 $\pm$ 20.55%	2.3840E+17 $\pm$ 5.72%
1750.38	1.0680E+16 $\pm$ 29.43%	2.6961E+16 $\pm$ 15.00%	3.1709E+16 $\pm$ 10.12%	8.0179E+16 $\pm$ 12.90%	b	1.5303E+17 $\pm$ 8.14%
2135.19	8.8985E+15 $\pm$ 29.19%	1.1751E+16 $\pm$ 27.96%	2.0447E+16 $\pm$ 11.58%	4.2615E+16 $\pm$ 12.92%	b	8.6540E+16 $\pm$ 9.21%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-147. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	2.9707E+16 $\pm$ 27.27%	8.9746E+16 $\pm$ 15.94%	1.0916E+17 $\pm$ 10.08%	3.2250E+17 $\pm$ 11.05%	5.7620E+15 $\pm$ 21.58%	5.5687E+17 $\pm$ 7.52%
300.38	4.2534E+16 $\pm$ 22.49%	1.0288E+17 $\pm$ 13.46%	1.4828E+17 $\pm$ 8.38%	4.7388E+17 $\pm$ 8.53%	1.3555E+16 $\pm$ 28.13%	7.8114E+17 $\pm$ 5.98%
500.38	5.3911E+16 $\pm$ 18.58%	1.2018E+17 $\pm$ 13.01%	1.8785E+17 $\pm$ 9.26%	5.2361E+17 $\pm$ 6.56%	1.7102E+16 $\pm$ 18.16%	9.0266E+17 $\pm$ 4.95%
700.38	4.1308E+16 $\pm$ 22.76%	1.5219E+17 $\pm$ 15.63%	1.2540E+17 $\pm$ 10.00%	4.2954E+17 $\pm$ 7.17%	1.4526E+16 $\pm$ 23.56%	7.6297E+17 $\pm$ 5.64%
900.38	b	1.0495E+17 $\pm$ 14.33%	8.6892E+16 $\pm$ 8.99%	2.8896E+17 $\pm$ 9.29%	1.2926E+16 $\pm$ 27.01%	5.3628E+17 $\pm$ 7.05%
1150.38	2.9356E+16 $\pm$ 20.97%	7.1540E+16 $\pm$ 14.88%	7.4340E+16 $\pm$ 7.48%	2.0629E+17 $\pm$ 8.51%	6.5332E+15 $\pm$ 22.35%	3.8806E+17 $\pm$ 5.92%
1450.38	1.7462E+16 $\pm$ 26.77%	3.7932E+16 $\pm$ 17.29%	5.9482E+16 $\pm$ 11.36%	1.1742E+17 $\pm$ 11.95%	7.8049E+15 $\pm$ 23.72%	2.4010E+17 $\pm$ 7.74%
1750.38	b	3.2805E+16 $\pm$ 21.95%	2.3352E+16 $\pm$ 7.48%	8.9538E+16 $\pm$ 17.27%	b	1.5674E+17 $\pm$ 11.16%
2135.19	b	b	1.8102E+16 $\pm$ 13.76%	3.8792E+16 $\pm$ 15.29%	b	7.8138E+16 $\pm$ 10.92%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-148. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-3 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	b	1.0568E+17 $\pm$ 25.48%	1.0691E+17 $\pm$ 13.20%	2.6941E+17 $\pm$ 11.15%	b	5.1307E+17 $\pm$ 8.75%
300.38	4.4942E+16 $\pm$ 25.46%	1.0721E+17 $\pm$ 19.56%	1.3042E+17 $\pm$ 11.02%	3.6841E+17 $\pm$ 8.25%	7.8356E+15 $\pm$ 28.02%	6.5881E+17 $\pm$ 6.44%
500.38	5.7445E+16 $\pm$ 27.13%	1.3595E+17 $\pm$ 16.28%	1.8722E+17 $\pm$ 12.62%	4.4666E+17 $\pm$ 7.62%	6.9131E+15 $\pm$ 19.30%	8.3418E+17 $\pm$ 6.27%
700.38	3.2137E+16 $\pm$ 29.14%	1.3272E+17 $\pm$ 18.96%	1.1531E+17 $\pm$ 10.52%	3.6633E+17 $\pm$ 8.71%	b	6.5169E+17 $\pm$ 6.74%
935.19	b	8.7197E+16 $\pm$ 15.92%	1.0243E+17 $\pm$ 13.58%	2.3618E+17 $\pm$ 10.47%	3.9258E+15 $\pm$ 26.41%	4.5824E+17 $\pm$ 7.36%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-149. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-4 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$2.3780\text{E}+16 \pm 14.86\%$	$5.7304\text{E}+16 \pm 12.27\%$	$7.9518\text{E}+16 \pm 5.67\%$	$2.1817\text{E}+17 \pm 8.49\%$	$1.2875\text{E}+16 \pm 16.28\%$	$3.9165\text{E}+17 \pm 5.45\%$
300.38	$3.3352\text{E}+16 \pm 13.44\%$	$7.2057\text{E}+16 \pm 9.42\%$	$7.9966\text{E}+16 \pm 5.75\%$	$2.3116\text{E}+17 \pm 5.87\%$	$1.9161\text{E}+16 \pm 14.80\%$	$4.3569\text{E}+17 \pm 4.01\%$
500.38	$3.8437\text{E}+16 \pm 17.28\%$	$8.3964\text{E}+16 \pm 9.59\%$	$8.4280\text{E}+16 \pm 6.38\%$	$2.7007\text{E}+17 \pm 6.00\%$	$2.3321\text{E}+16 \pm 16.42\%$	$5.0007\text{E}+17 \pm 4.31\%$
700.38	$3.3296\text{E}+16 \pm 16.09\%$	$7.2456\text{E}+16 \pm 9.93\%$	$8.2490\text{E}+16 \pm 6.58\%$	$2.6175\text{E}+17 \pm 6.55\%$	$2.0624\text{E}+16 \pm 13.02\%$	$4.7062\text{E}+17 \pm 4.46\%$
900.38	$3.2113\text{E}+16 \pm 15.76\%$	$6.3029\text{E}+16 \pm 9.93\%$	$7.2278\text{E}+16 \pm 6.45\%$	$1.7755\text{E}+17 \pm 6.89\%$	$1.9750\text{E}+16 \pm 17.75\%$	$3.6473\text{E}+17 \pm 4.61\%$
1150.38	$3.2066\text{E}+16 \pm 15.74\%$	$6.5258\text{E}+16 \pm 10.10\%$	$5.6112\text{E}+16 \pm 4.78\%$	$1.6499\text{E}+17 \pm 7.18\%$	$1.6280\text{E}+16 \pm 21.69\%$	$3.3471\text{E}+17 \pm 4.84\%$
1450.38	$1.8202\text{E}+16 \pm 18.23\%$	$3.8886\text{E}+16 \pm 11.74\%$	$4.6982\text{E}+16 \pm 6.08\%$	$1.1541\text{E}+17 \pm 10.15\%$	$1.1766\text{E}+16 \pm 17.91\%$	$2.3125\text{E}+17 \pm 6.16\%$
1750.38	$1.3065\text{E}+16 \pm 28.39\%$	$2.4142\text{E}+16 \pm 15.37\%$	$2.7065\text{E}+16 \pm 8.11\%$	$6.0944\text{E}+16 \pm 10.35\%$	$3.9676\text{E}+15 \pm 23.90\%$	$1.2918\text{E}+17 \pm 7.13\%$
2135.19	$4.5000\text{E}+15 \pm 23.08\%$	$1.1157\text{E}+16 \pm 14.23\%$	$1.3698\text{E}+16 \pm 8.85\%$	$3.0690\text{E}+16 \pm 11.43\%$	$2.6012\text{E}+15 \pm 26.55\%$	$6.2647\text{E}+16 \pm 7.47\%$

Table E-150. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-4 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$2.5932\text{E}+16 \pm 18.13\%$	$7.4293\text{E}+16 \pm 14.91\%$	$8.3624\text{E}+16 \pm 6.49\%$	$2.2303\text{E}+17 \pm 10.93\%$	$8.2083\text{E}+15 \pm 18.01\%$	$4.1508\text{E}+17 \pm 6.95\%$
300.38	$3.3775\text{E}+16 \pm 16.08\%$	$8.0079\text{E}+16 \pm 11.83\%$	$9.5259\text{E}+16 \pm 7.63\%$	$2.3008\text{E}+17 \pm 7.75\%$	$9.7123\text{E}+15 \pm 18.66\%$	$4.4891\text{E}+17 \pm 5.13\%$
500.38	$3.5641\text{E}+16 \pm 16.16\%$	$1.1027\text{E}+17 \pm 11.02\%$	$8.3126\text{E}+16 \pm 6.56\%$	$2.4205\text{E}+17 \pm 7.13\%$	$1.2632\text{E}+16 \pm 18.66\%$	$4.8372\text{E}+17 \pm 5.04\%$
700.38	$3.8841\text{E}+16 \pm 15.79\%$	$8.4035\text{E}+16 \pm 14.40\%$	$8.7736\text{E}+16 \pm 7.15\%$	$2.5274\text{E}+17 \pm 7.52\%$	$1.5553\text{E}+16 \pm 19.24\%$	$4.7891\text{E}+17 \pm 5.25\%$
900.38	$3.1205\text{E}+16 \pm 18.55\%$	$6.2224\text{E}+16 \pm 11.85\%$	$7.8699\text{E}+16 \pm 7.90\%$	$1.6679\text{E}+17 \pm 8.96\%$	$1.3539\text{E}+16 \pm 21.04\%$	$3.5246\text{E}+17 \pm 5.67\%$
1150.38	$3.6043\text{E}+16 \pm 18.01\%$	$8.6255\text{E}+16 \pm 11.01\%$	$6.8891\text{E}+16 \pm 5.92\%$	$1.7649\text{E}+17 \pm 8.01\%$	$1.2684\text{E}+16 \pm 29.27\%$	$3.8037\text{E}+17 \pm 5.35\%$
1450.38	$2.1109\text{E}+16 \pm 18.84\%$	$4.8452\text{E}+16 \pm 13.61\%$	$5.3537\text{E}+16 \pm 6.97\%$	$1.1025\text{E}+17 \pm 9.76\%$	$1.2126\text{E}+16 \pm 24.16\%$	$2.4548\text{E}+17 \pm 5.96\%$
1750.38	$1.1204\text{E}+16 \pm 27.13\%$	$4.0040\text{E}+16 \pm 20.97\%$	$2.9942\text{E}+16 \pm 9.16\%$	$6.1700\text{E}+16 \pm 11.60\%$	b	$1.4614\text{E}+17 \pm 8.71\%$
2135.19	$4.9909\text{E}+15 \pm 28.81\%$	$1.4809\text{E}+16 \pm 18.14\%$	$1.5195\text{E}+16 \pm 13.09\%$	$2.7603\text{E}+16 \pm 11.71\%$	b	$6.5738\text{E}+16 \pm 8.21\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-151. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-4 Sample Holder. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	$2.6863\text{E}+16 \pm 29.41\%$	$8.5431\text{E}+16 \pm 17.61\%$	$9.1823\text{E}+16 \pm 9.42\%$	$1.7287\text{E}+17 \pm 10.46\%$	b	$3.8143\text{E}+17 \pm 7.33\%$
300.38	$4.5969\text{E}+16 \pm 19.51\%$	$7.1970\text{E}+16 \pm 18.07\%$	$9.8968\text{E}+16 \pm 11.15\%$	$2.5107\text{E}+17 \pm 10.48\%$	b	$4.7491\text{E}+17 \pm 7.44\%$
500.38	$3.9897\text{E}+16 \pm 21.92\%$	$1.2812\text{E}+17 \pm 13.77\%$	$9.6847\text{E}+16 \pm 10.74\%$	$2.3805\text{E}+17 \pm 9.18\%$	b	$5.1482\text{E}+17 \pm 6.35\%$
700.38	$2.9371\text{E}+16 \pm 23.03\%$	$8.6809\text{E}+16 \pm 15.43\%$	$8.6829\text{E}+16 \pm 9.44\%$	$2.1872\text{E}+17 \pm 9.45\%$	$5.2107\text{E}+15 \pm 28.54\%$	$4.2694\text{E}+17 \pm 6.43\%$
900.38	b	$8.3499\text{E}+16 \pm 15.24\%$	$8.5756\text{E}+16 \pm 10.92\%$	$1.4631\text{E}+17 \pm 10.43\%$	b	$3.3707\text{E}+17 \pm 6.89\%$
1150.38	$2.1592\text{E}+16 \pm 21.36\%$	$7.0920\text{E}+16 \pm 14.03\%$	$6.5102\text{E}+16 \pm 7.72\%$	$1.6884\text{E}+17 \pm 10.80\%$	$6.1077\text{E}+15 \pm 25.75\%$	$3.3256\text{E}+17 \pm 6.76\%$
1450.38	$1.5184\text{E}+16 \pm 27.89\%$	$4.0562\text{E}+16 \pm 20.78\%$	$5.1636\text{E}+16 \pm 9.46\%$	$9.7334\text{E}+16 \pm 13.05\%$	b	$2.1275\text{E}+17 \pm 8.25\%$
1750.38	b	$2.6624\text{E}+16 \pm 25.06\%$	$2.9712\text{E}+16 \pm 10.18\%$	$6.9200\text{E}+16 \pm 15.39\%$	b	$1.3465\text{E}+17 \pm 10.12\%$
2135.19	b	$1.5931\text{E}+16 \pm 23.26\%$	$1.2993\text{E}+16 \pm 12.71\%$	$2.9938\text{E}+16 \pm 17.11\%$	b	$6.6550\text{E}+16 \pm 11.46\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-152. Five-group Photon Spectrum (m^2s^{-1}) in the Vertical Hole VH-4 Aluminum/Iridium Sample. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
100.19	b	$7.0322\text{E}+16 \pm 21.44\%$	$8.2904\text{E}+16 \pm 10.85\%$	$1.4879\text{E}+17 \pm 12.88\%$	b	$3.3476\text{E}+17 \pm 8.40\%$
300.38	$4.6793\text{E}+16 \pm 24.94\%$	$7.6015\text{E}+16 \pm 23.24\%$	$9.8862\text{E}+16 \pm 12.92\%$	$2.1999\text{E}+17 \pm 13.80\%$	b	$4.4343\text{E}+17 \pm 9.40\%$
500.38	$3.3724\text{E}+16 \pm 25.47\%$	$1.2382\text{E}+17 \pm 18.51\%$	$8.8152\text{E}+16 \pm 14.05\%$	$2.1146\text{E}+17 \pm 12.76\%$	b	$4.5936\text{E}+17 \pm 8.63\%$
700.38	$3.1141\text{E}+16 \pm 27.18\%$	$8.3029\text{E}+16 \pm 19.60\%$	$8.5494\text{E}+16 \pm 11.59\%$	$1.8685\text{E}+17 \pm 12.17\%$	b	$3.8901\text{E}+17 \pm 8.08\%$
935.19	$2.2495\text{E}+16 \pm 25.06\%$	$8.2328\text{E}+16 \pm 16.56\%$	$8.4725\text{E}+16 \pm 12.74\%$	$1.5634\text{E}+17 \pm 11.04\%$	$1.4468\text{E}+15 \pm 27.84\%$	$3.4733\text{E}+17 \pm 7.35\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-153. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 Inner Thimble. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-111.63	2.9251E+17 ± 2.32%	8.9908E+17 ± 1.67%	1.1432E+18 ± 1.09%	5.8357E+18 ± 0.66%	3.1465E+17 ± 2.17%	8.4852E+18 ± 0.54%
50.00	2.5209E+17 ± 3.14%	7.0119E+17 ± 2.12%	8.8305E+17 ± 1.39%	3.4205E+18 ± 1.00%	1.3211E+17 ± 3.55%	5.3889E+18 ± 0.77%
175.00	1.8618E+17 ± 3.00%	5.1449E+17 ± 1.98%	6.3549E+17 ± 1.30%	2.3598E+18 ± 0.95%	7.8682E+16 ± 3.39%	3.7747E+18 ± 0.73%
325.00	1.4587E+17 ± 3.58%	3.7973E+17 ± 2.26%	4.7629E+17 ± 1.46%	1.6797E+18 ± 1.14%	5.1678E+16 ± 4.27%	2.7333E+18 ± 0.86%
500.00	1.0681E+17 ± 3.51%	2.7498E+17 ± 2.50%	3.3238E+17 ± 1.35%	1.1537E+18 ± 1.17%	3.1271E+16 ± 4.18%	1.8992E+18 ± 0.88%
700.00	7.6528E+16 ± 4.43%	2.0286E+17 ± 2.82%	2.3448E+17 ± 1.53%	7.8629E+17 ± 1.44%	2.3908E+16 ± 5.09%	1.3241E+18 ± 1.07%
900.00	4.9109E+16 ± 4.74%	1.3191E+17 ± 3.10%	1.7235E+17 ± 1.97%	5.4597E+17 ± 1.53%	1.4518E+16 ± 6.92%	9.1386E+17 ± 1.17%
1200.00	6.8550E+16 ± 5.21%	1.8165E+17 ± 3.40%	2.8638E+17 ± 2.44%	7.7470E+17 ± 1.70%	2.3027E+16 ± 7.96%	1.3343E+18 ± 1.29%

Table E-154. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 Outer Thimble. Normalized to 330 Mw, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-125.35	3.3718E+17 ± 1.62%	9.4693E+17 ± 1.07%	1.2351E+18 ± 0.74%	6.0739E+18 ± 0.53%	3.8300E+17 ± 1.25%	8.9761E+18 ± 0.42%
50.00	2.6210E+17 ± 2.43%	6.9006E+17 ± 1.62%	8.3274E+17 ± 1.07%	3.2342E+18 ± 0.87%	1.5099E+17 ± 2.58%	5.1701E+18 ± 0.66%
175.00	1.9996E+17 ± 2.39%	5.0960E+17 ± 1.58%	6.2634E+17 ± 1.04%	2.1852E+18 ± 0.87%	8.7702E+16 ± 2.75%	3.6088E+18 ± 0.65%
325.00	1.4458E+17 ± 2.84%	3.8401E+17 ± 1.88%	4.4695E+17 ± 1.23%	1.5182E+18 ± 0.99%	5.6062E+16 ± 3.01%	2.5498E+18 ± 0.74%
500.00	1.0291E+17 ± 2.75%	2.7701E+17 ± 1.93%	3.1844E+17 ± 1.14%	1.0534E+18 ± 1.10%	3.7687E+16 ± 3.49%	1.7894E+18 ± 0.80%
700.00	7.3630E+16 ± 3.37%	1.8735E+17 ± 2.20%	2.2441E+17 ± 1.34%	7.2064E+17 ± 1.24%	2.5979E+16 ± 3.69%	1.2320E+18 ± 0.92%
900.00	5.0583E+16 ± 3.79%	1.3125E+17 ± 2.60%	1.6608E+17 ± 1.60%	4.8777E+17 ± 1.46%	1.6670E+16 ± 4.43%	8.5236E+17 ± 1.08%
1200.00	6.7861E+16 ± 4.25%	1.7357E+17 ± 2.75%	2.5030E+17 ± 1.60%	6.6776E+17 ± 1.51%	1.9149E+16 ± 6.09%	1.1786E+18 ± 1.11%

Table E-155. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
50.00	$1.6726\text{E}+17 \pm 3.58\%$	$4.4040\text{E}+17 \pm 2.46\%$	$5.7466\text{E}+17 \pm 2.38\%$	$3.1525\text{E}+18 \pm 1.23\%$	$3.2250\text{E}+17 \pm 2.73\%$	$4.6573\text{E}+18 \pm 0.97\%$
175.00	$1.3621\text{E}+17 \pm 2.88\%$	$3.4795\text{E}+17 \pm 2.17\%$	$4.0374\text{E}+17 \pm 1.62\%$	$2.0583\text{E}+18 \pm 1.08\%$	$1.9175\text{E}+17 \pm 3.11\%$	$3.1379\text{E}+18 \pm 0.84\%$
325.00	$1.0077\text{E}+17 \pm 4.20\%$	$2.4441\text{E}+17 \pm 2.55\%$	$2.8758\text{E}+17 \pm 1.56\%$	$1.3690\text{E}+18 \pm 1.21\%$	$1.2330\text{E}+17 \pm 3.41\%$	$2.1050\text{E}+18 \pm 0.94\%$
500.00	$6.5544\text{E}+16 \pm 3.52\%$	$1.6470\text{E}+17 \pm 2.32\%$	$1.9839\text{E}+17 \pm 1.64\%$	$9.1846\text{E}+17 \pm 1.41\%$	$7.8585\text{E}+16 \pm 3.54\%$	$1.4257\text{E}+18 \pm 1.04\%$
700.00	$5.0165\text{E}+16 \pm 5.45\%$	$1.1361\text{E}+17 \pm 2.65\%$	$1.3898\text{E}+17 \pm 1.73\%$	$6.1625\text{E}+17 \pm 1.55\%$	$5.5566\text{E}+16 \pm 4.27\%$	$9.7457\text{E}+17 \pm 1.17\%$
900.00	$3.4101\text{E}+16 \pm 4.63\%$	$7.7208\text{E}+16 \pm 2.95\%$	$1.0833\text{E}+17 \pm 2.30\%$	$4.2538\text{E}+17 \pm 1.64\%$	$3.4106\text{E}+16 \pm 5.12\%$	$6.7913\text{E}+17 \pm 1.26\%$
1200.00	$4.2949\text{E}+16 \pm 4.27\%$	$1.0997\text{E}+17 \pm 3.26\%$	$2.1336\text{E}+17 \pm 3.05\%$	$5.5399\text{E}+17 \pm 1.74\%$	$3.2424\text{E}+16 \pm 6.32\%$	$9.5269\text{E}+17 \pm 1.40\%$

Table E-156. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 Very Cold Guide Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
18.25	$1.6390\text{E}+17 \pm 13.74\%$	$4.5565\text{E}+17 \pm 10.02\%$	$6.2791\text{E}+17 \pm 8.14\%$	$2.2761\text{E}+18 \pm 4.89\%$	$1.0056\text{E}+17 \pm 16.54\%$	$3.6241\text{E}+18 \pm 3.73\%$
125.00	$1.4601\text{E}+17 \pm 9.86\%$	$4.2924\text{E}+17 \pm 6.49\%$	$5.3530\text{E}+17 \pm 3.89\%$	$2.0439\text{E}+18 \pm 3.03\%$	$6.6604\text{E}+16 \pm 12.72\%$	$3.2211\text{E}+18 \pm 2.28\%$
275.00	$1.0085\text{E}+17 \pm 11.06\%$	$3.2520\text{E}+17 \pm 7.36\%$	$3.8369\text{E}+17 \pm 5.32\%$	$1.4368\text{E}+18 \pm 3.36\%$	$3.7288\text{E}+16 \pm 16.77\%$	$2.2839\text{E}+18 \pm 2.63\%$
450.00	$1.0493\text{E}+17 \pm 11.38\%$	$2.6829\text{E}+17 \pm 10.34\%$	$2.8996\text{E}+17 \pm 5.53\%$	$9.7821\text{E}+17 \pm 3.60\%$	$2.4395\text{E}+16 \pm 17.59\%$	$1.6658\text{E}+18 \pm 3.02\%$
650.00	$6.7407\text{E}+16 \pm 13.10\%$	$1.6160\text{E}+17 \pm 8.06\%$	$2.5121\text{E}+17 \pm 10.80\%$	$6.6694\text{E}+17 \pm 4.39\%$	$1.5219\text{E}+16 \pm 19.18\%$	$1.1624\text{E}+18 \pm 3.72\%$
1075.00	$3.4592\text{E}+16 \pm 11.50\%$	$1.1949\text{E}+17 \pm 10.46\%$	$1.4588\text{E}+17 \pm 7.31\%$	$3.8539\text{E}+17 \pm 4.67\%$	^b	$6.9583\text{E}+17 \pm 3.69\%$

^a No particle interactions recorded.

^b Poor statistics; value not reported.

Table E-157. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 Liquid D_2 Feed Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
125.00	$1.4719\text{E}+17 \pm 12.80\%$	$4.9852\text{E}+17 \pm 14.48\%$	$5.8594\text{E}+17 \pm 10.01\%$	$2.4583\text{E}+18 \pm 5.14\%$	$5.2642\text{E}+16 \pm 14.27\%$	$3.7426\text{E}+18 \pm 4.23\%$
275.00	$8.5560\text{E}+16 \pm 21.66\%$	$2.4452\text{E}+17 \pm 11.62\%$	$3.8596\text{E}+17 \pm 9.22\%$	$1.5454\text{E}+18 \pm 6.91\%$	$4.6595\text{E}+16 \pm 26.25\%$	$2.3080\text{E}+18 \pm 5.14\%$
450.00	$7.6888\text{E}+16 \pm 22.33\%$	$2.0984\text{E}+17 \pm 14.15\%$	$2.4996\text{E}+17 \pm 9.63\%$	$9.9794\text{E}+17 \pm 7.28\%$	b	$1.5633\text{E}+18 \pm 5.41\%$
650.00	$4.6974\text{E}+16 \pm 26.71\%$	$1.3000\text{E}+17 \pm 19.24\%$	$1.7035\text{E}+17 \pm 9.85\%$	$6.8757\text{E}+17 \pm 7.59\%$	b	$1.0477\text{E}+18 \pm 5.95\%$
1075.00	b	$1.2030\text{E}+17 \pm 21.96\%$	$9.2898\text{E}+16 \pm 8.00\%$	$3.9221\text{E}+17 \pm 15.14\%$	$6.5957\text{E}+15 \pm 24.40\%$	$6.5869\text{E}+17 \pm 10.27\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-158. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-1 D_2 Return Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
125.00	$1.4504\text{E}+17 \pm 10.02\%$	$4.1017\text{E}+17 \pm 5.91\%$	$5.8407\text{E}+17 \pm 6.05\%$	$2.3421\text{E}+18 \pm 3.58\%$	$8.0144\text{E}+16 \pm 12.51\%$	$3.5615\text{E}+18 \pm 2.70\%$
275.00	$1.0170\text{E}+16 \pm 15.39\%$	$2.7382\text{E}+16 \pm 9.63\%$	$3.9541\text{E}+16 \pm 6.37\%$	$1.4502\text{E}+17 \pm 5.32\%$	$4.5320\text{E}+15 \pm 20.54\%$	$2.2665\text{E}+17 \pm 3.88\%$
450.00	$9.8812\text{E}+15 \pm 15.22\%$	$1.9498\text{E}+16 \pm 8.61\%$	$2.4521\text{E}+16 \pm 5.81\%$	$9.8343\text{E}+16 \pm 4.83\%$	$3.4784\text{E}+15 \pm 29.17\%$	$1.5572\text{E}+17 \pm 3.57\%$
650.00	$5.6630\text{E}+15 \pm 16.82\%$	$1.7336\text{E}+16 \pm 19.03\%$	$1.9901\text{E}+16 \pm 12.19\%$	$6.3280\text{E}+16 \pm 5.80\%$	$1.7705\text{E}+15 \pm 24.49\%$	$1.0795\text{E}+17 \pm 5.20\%$
1075.00	$5.3410\text{E}+16 \pm 19.67\%$	$7.9933\text{E}+16 \pm 14.91\%$	$1.3800\text{E}+17 \pm 13.31\%$	$3.5142\text{E}+17 \pm 5.26\%$	$8.3387\text{E}+15 \pm 15.84\%$	$6.3110\text{E}+17 \pm 4.87\%$

Table E-159. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 Inner Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-111.63	3.0795E+17	± 2.43%	8.9166E+17	± 1.49%	1.1664E+18	± 1.08%	6.0057E+18	± 0.69%	3.2200E+17	± 2.23%	8.6938E+18	± 0.54%
50.00	2.7985E+17	± 3.20%	6.8976E+17	± 1.99%	8.5734E+17	± 1.40%	3.3930E+18	± 0.96%	1.2954E+17	± 3.40%	5.3494E+18	± 0.74%
175.00	2.0535E+17	± 3.03%	5.2604E+17	± 2.02%	6.4545E+17	± 1.57%	2.4036E+18	± 0.97%	8.2649E+16	± 3.51%	3.8631E+18	± 0.76%
325.00	1.4971E+17	± 3.63%	3.9528E+17	± 2.44%	4.7345E+17	± 1.58%	1.6859E+18	± 1.10%	5.3426E+16	± 4.46%	2.7577E+18	± 0.86%
500.00	1.0126E+17	± 3.46%	2.6915E+17	± 2.31%	3.2848E+17	± 1.58%	1.1859E+18	± 1.23%	3.6442E+16	± 4.67%	1.9213E+18	± 0.92%
700.00	6.9540E+16	± 4.17%	1.9206E+17	± 2.72%	2.3246E+17	± 1.57%	8.0366E+17	± 1.35%	2.2031E+16	± 4.98%	1.3198E+18	± 1.01%
900.00	4.9506E+16	± 4.94%	1.4116E+17	± 3.12%	1.7365E+17	± 1.84%	5.4987E+17	± 1.67%	1.6419E+16	± 7.58%	9.3060E+17	± 1.22%
1200.00	7.8146E+16	± 5.18%	1.8788E+17	± 3.37%	2.7647E+17	± 2.31%	7.9999E+17	± 1.76%	1.9527E+16	± 7.28%	1.3620E+18	± 1.32%

Table E-160. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 Outer Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-125.35	3.5472E+17	± 1.61%	9.5906E+17	± 1.05%	1.2325E+18	± 0.72%	6.1128E+18	± 0.52%	3.8135E+17	± 1.25%	9.0404E+18	± 0.41%
50.00	2.6765E+17	± 2.45%	6.8501E+17	± 1.69%	8.2179E+17	± 1.03%	3.2660E+18	± 0.87%	1.4957E+17	± 2.52%	5.1900E+18	± 0.66%
175.00	1.9651E+17	± 2.45%	4.9754E+17	± 1.56%	6.1195E+17	± 1.03%	2.2191E+18	± 0.88%	9.1372E+16	± 2.66%	3.6165E+18	± 0.66%
325.00	1.4759E+17	± 2.76%	3.7868E+17	± 1.84%	4.3303E+17	± 1.06%	1.5373E+18	± 0.98%	6.0463E+16	± 3.11%	2.5570E+18	± 0.74%
500.00	1.1465E+17	± 2.90%	2.6834E+17	± 1.96%	3.1397E+17	± 1.10%	1.0488E+18	± 1.04%	3.5336E+16	± 2.90%	1.7811E+18	± 0.78%
700.00	7.2853E+16	± 3.48%	1.8021E+17	± 2.19%	2.2428E+17	± 1.58%	6.9941E+17	± 1.21%	2.3539E+16	± 3.61%	1.2003E+18	± 0.92%
900.00	5.1042E+16	± 3.99%	1.2902E+17	± 2.47%	1.5945E+17	± 1.51%	4.8297E+17	± 1.38%	1.5733E+16	± 4.93%	8.3821E+17	± 1.03%
1200.00	7.5525E+16	± 4.33%	1.7195E+17	± 2.88%	2.4481E+17	± 1.65%	6.7234E+17	± 1.54%	1.8886E+16	± 6.57%	1.1835E+18	± 1.14%

Table E-161. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 Cooling Jacket. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-140.10	2.5206E+17 ± 2.11%	7.2600E+17 ± 1.32%	9.8986E+17 ± 0.94%	7.2668E+18 ± 0.50%	9.1766E+17 ± 1.14%	1.0152E+19 ± 0.42%
50.00	1.7188E+17 ± 4.10%	4.5114E+17 ± 2.14%	5.5768E+17 ± 2.16%	3.1418E+18 ± 1.09%	3.3170E+17 ± 3.00%	4.6542E+18 ± 0.87%
175.00	1.3812E+17 ± 3.36%	3.4134E+17 ± 2.18%	4.1592E+17 ± 1.76%	2.1161E+18 ± 1.03%	1.9899E+17 ± 3.07%	3.2105E+18 ± 0.82%
325.00	9.3753E+16 ± 3.11%	2.3647E+17 ± 2.60%	2.8403E+17 ± 1.59%	1.4075E+18 ± 1.22%	1.2287E+17 ± 3.43%	2.1446E+18 ± 0.95%
500.00	6.8263E+16 ± 3.73%	1.6432E+17 ± 2.29%	2.0186E+17 ± 2.34%	9.0615E+17 ± 1.29%	7.8448E+16 ± 3.73%	1.4190E+18 ± 1.00%
700.00	4.7808E+16 ± 5.11%	1.1947E+17 ± 3.21%	1.4336E+17 ± 2.38%	6.0689E+17 ± 1.48%	4.9877E+16 ± 3.87%	9.6740E+17 ± 1.16%
900.00	3.5926E+16 ± 5.33%	8.7514E+16 ± 4.99%	1.0452E+17 ± 2.24%	4.1175E+17 ± 1.71%	3.1612E+16 ± 4.71%	6.7132E+17 ± 1.42%
1200.00	5.1004E+16 ± 5.80%	1.0803E+17 ± 3.29%	2.0190E+17 ± 2.46%	5.3682E+17 ± 1.72%	3.1961E+16 ± 6.68%	9.2971E+17 ± 1.33%

Table E-162. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 Very Cold Guide Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
18.25	1.2419E+17 ± 17.18%	5.4676E+17 ± 8.84%	7.3340E+17 ± 10.51%	2.5279E+18 ± 4.58%	9.6287E+16 ± 16.62%	4.0285E+18 ± 3.73%
125.00	1.4343E+17 ± 8.27%	4.0679E+17 ± 6.14%	4.9292E+17 ± 4.82%	1.9437E+18 ± 2.90%	6.5305E+16 ± 15.28%	3.0522E+18 ± 2.24%
275.00	1.0104E+17 ± 12.52%	2.9240E+17 ± 8.66%	3.5581E+17 ± 4.59%	1.3971E+18 ± 3.47%	6.1267E+16 ± 18.21%	2.2076E+18 ± 2.70%
450.00	9.1506E+16 ± 11.23%	2.2614E+17 ± 8.01%	2.6818E+17 ± 5.85%	9.3076E+17 ± 3.40%	2.7171E+16 ± 13.78%	1.5438E+18 ± 2.68%
650.00	6.0660E+16 ± 15.77%	1.4876E+17 ± 10.70%	1.8372E+17 ± 8.74%	6.1583E+17 ± 4.49%	b	1.0359E+18 ± 3.79%
1075.00	4.3936E+16 ± 13.05%	9.7094E+16 ± 9.59%	1.3221E+17 ± 5.97%	3.8467E+17 ± 4.17%	8.7841E+15 ± 18.98%	6.6670E+17 ± 3.18%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-163. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 Liquid D_2 Feed Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
125.00	$1.3325\text{E}+17 \pm 13.08\%$	$4.2280\text{E}+17 \pm 8.61\%$	$5.2891\text{E}+17 \pm 6.56\%$	$2.2881\text{E}+18 \pm 4.40\%$	$6.4805\text{E}+16 \pm 16.97\%$	$3.4379\text{E}+18 \pm 3.34\%$
275.00	$7.7743\text{E}+16 \pm 18.96\%$	$2.9334\text{E}+17 \pm 14.02\%$	$3.4773\text{E}+17 \pm 8.33\%$	$1.4903\text{E}+18 \pm 6.18\%$	b	$2.2582\text{E}+18 \pm 4.78\%$
450.00	$9.9801\text{E}+16 \pm 16.12\%$	$2.5997\text{E}+17 \pm 16.01\%$	$3.0149\text{E}+17 \pm 11.45\%$	$1.0498\text{E}+18 \pm 7.73\%$	b	$1.7768\text{E}+18 \pm 5.72\%$
650.00	$6.2949\text{E}+16 \pm 22.52\%$	$1.6205\text{E}+17 \pm 16.50\%$	$1.4288\text{E}+17 \pm 6.05\%$	$7.9778\text{E}+17 \pm 14.97\%$	b	$1.1784\text{E}+18 \pm 10.49\%$
1075.00	$2.7456\text{E}+16 \pm 24.40\%$	$7.7563\text{E}+16 \pm 15.89\%$	$1.0802\text{E}+17 \pm 8.90\%$	$3.6028\text{E}+17 \pm 7.43\%$	b	$5.9533\text{E}+17 \pm 6.11\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-164. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source CS-2 D_2 Return Line. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
125.00	$1.3232\text{E}+17 \pm 10.54\%$	$4.4681\text{E}+17 \pm 6.39\%$	$5.3485\text{E}+17 \pm 4.26\%$	$2.3068\text{E}+18 \pm 3.12\%$	$5.6751\text{E}+16 \pm 10.49\%$	$3.4775\text{E}+18 \pm 2.37\%$
275.00	$8.8857\text{E}+16 \pm 15.37\%$	$3.1222\text{E}+17 \pm 8.60\%$	$3.8328\text{E}+17 \pm 7.08\%$	$1.5230\text{E}+18 \pm 4.91\%$	$3.3275\text{E}+16 \pm 15.89\%$	$2.3407\text{E}+18 \pm 3.65\%$
450.00	$8.9077\text{E}+16 \pm 16.55\%$	$2.2963\text{E}+17 \pm 11.09\%$	$2.6029\text{E}+17 \pm 6.82\%$	$1.0757\text{E}+18 \pm 4.59\%$	$3.2823\text{E}+16 \pm 20.54\%$	$1.6876\text{E}+18 \pm 3.59\%$
650.00	$6.5798\text{E}+16 \pm 20.04\%$	$1.9101\text{E}+17 \pm 12.01\%$	$2.0856\text{E}+17 \pm 8.84\%$	$6.9528\text{E}+17 \pm 5.61\%$	$2.3870\text{E}+16 \pm 27.24\%$	$1.1845\text{E}+18 \pm 4.33\%$
1075.00	$3.5411\text{E}+16 \pm 15.62\%$	$9.6496\text{E}+16 \pm 12.79\%$	$1.0520\text{E}+17 \pm 5.54\%$	$3.8059\text{E}+17 \pm 5.76\%$	b	$6.2918\text{E}+17 \pm 4.30\%$

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-165. Five-group Photon Spectrum (m^2s^{-1}) in the Cold Source Miscellaneous Components. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Cell Description	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total
CS-1 Shell	2.5648E+17	± 1.91%	7.1686E+17	± 1.27%	9.5580E+17	± 0.84%	4.5135E+18	± 0.58%	2.3131E+17	± 1.88%	6.6740E+18	± 0.45%				
CS-1 Cavity Shell	1.6243E+17	± 5.47%	5.0700E+17	± 3.87%	6.9812E+17	± 2.07%	2.7554E+18	± 1.70%	1.1262E+17	± 6.90%	4.2355E+18	± 1.29%				
CS-1 Moderator LD ₂	2.3031E+17	± 1.71%	6.6059E+17	± 1.15%	9.2555E+17	± 0.86%	4.9831E+18	± 0.54%	3.0247E+17	± 2.04%	7.1020E+18	± 0.43%				
CS-1 Feed Line LD ₂	6.9446E+16	± 8.77%	1.9346E+17	± 5.99%	2.6458E+17	± 5.61%	1.0031E+18	± 3.06%	2.8372E+16	± 11.40%	1.5590E+18	± 2.36%				
CS-1 Moderator D ₂	2.0055E+17	± 3.16%	5.5866E+17	± 2.16%	7.8492E+17	± 1.58%	3.6464E+18	± 0.99%	1.7567E+17	± 4.25%	5.3662E+18	± 0.78%				
CS-1 Return Line D ₂	7.5185E+16	± 6.69%	2.0732E+17	± 5.49%	2.7004E+17	± 3.51%	1.0177E+18	± 2.21%	3.2808E+16	± 9.39%	1.6030E+18	± 1.73%				
CS-1 Tie Rod 1	1.3216E+17	± 17.50%	1.8366E+17	± 12.06%	2.9257E+17	± 8.36%	1.1899E+18	± 5.77%	2.6432E+16	± 22.86%	1.8248E+18	± 4.40%				
CS-1 Tie Rod 2	8.8114E+16	± 16.52%	2.2645E+17	± 10.82%	3.5610E+17	± 10.86%	1.0953E+18	± 5.83%	3.2642E+16	± 18.00%	1.7986E+18	± 4.46%				
CS-1 Window	2.6476E+16	± 8.15%	6.2426E+16	± 3.54%	9.5044E+16	± 2.40%	2.7644E+17	± 1.63%	7.0323E+15	± 10.56%	4.6741E+17	± 1.32%				
CS-2 Shell	2.6481E+17	± 1.95%	7.3804E+17	± 1.36%	9.6412E+17	± 0.86%	4.6059E+18	± 1.87%	2.3431E+17	± 1.87%	6.8072E+18	± 0.46%				
CS-2 Cavity Shell	1.8472E+17	± 6.44%	4.8310E+17	± 3.38%	6.8562E+17	± 2.10%	2.9107E+18	± 1.73%	1.0798E+17	± 6.29%	4.3721E+18	± 1.31%				
CS-2 Moderator LD ₂	2.4632E+17	± 1.65%	6.7728E+17	± 1.11%	9.2142E+17	± 0.84%	5.0729E+18	± 0.53%	3.1018E+17	± 2.02%	7.2281E+18	± 0.43%				
CS-2 Feed Line LD ₂	7.6562E+16	± 8.14%	2.2356E+17	± 6.66%	2.7102E+17	± 4.92%	1.0440E+18	± 2.84%	3.4074E+16	± 20.98%	1.6492E+18	± 2.26%				
CS-2 Moderator D ₂	2.0222E+17	± 3.17%	5.6984E+17	± 2.10%	7.6370E+17	± 1.53%	3.7834E+18	± 0.97%	1.8056E+17	± 4.37%	5.4997E+18	± 0.77%				
CS-2 Return Line D ₂	6.8653E+16	± 5.89%	2.1612E+17	± 4.10%	2.6470E+17	± 3.15%	1.0725E+18	± 2.30%	2.8841E+16	± 11.59%	1.6508E+18	± 1.70%				
CS-2 Tie Rod 1	1.2161E+17	± 22.15%	2.1863E+17	± 10.89%	2.4563E+17	± 4.81%	1.0961E+18	± 5.34%	2.6559E+16	± 28.63%	1.7085E+18	± 4.11%				
CS-2 Tie Rod 2	9.2632E+16	± 14.83%	1.9963E+17	± 11.57%	3.0277E+17	± 7.65%	1.0766E+18	± 4.92%	b			1.7179E+18	± 3.83%			
CS-2 Window	2.2593E+16	± 4.21%	6.4509E+16	± 3.34%	9.3376E+16	± 1.85%	2.8202E+17	± 2.01%	7.8066E+15	± 7.60%	4.7031E+17	± 1.37%				

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-166. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-1 Outer Tube. Normalized to 330 MHf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
425.00	2.8721E+17	± 4.73%	7.5153E+17	± 3.14%	8.5164E+17	± 1.95%	3.1102E+18	± 1.76%	1.1529E+17	± 5.89%	5.1159E+18	± 1.30%
500.00	1.3365E+17	± 6.50%	3.3613E+17	± 4.01%	4.5612E+17	± 2.57%	1.4176E+18	± 2.44%	5.1768E+16	± 8.71%	2.3953E+18	± 1.73%
600.00	1.2061E+17	± 7.03%	2.8021E+17	± 4.28%	3.4438E+17	± 2.82%	1.0655E+18	± 2.61%	4.0252E+16	± 8.56%	1.8509E+18	± 1.88%
700.00	9.6208E+16	± 7.83%	2.4243E+17	± 5.21%	2.7090E+17	± 3.10%	7.9766E+17	± 3.02%	3.5403E+16	± 11.34%	1.4426E+18	± 2.14%
825.00	8.0950E+16	± 7.13%	1.9259E+17	± 4.92%	2.1160E+17	± 2.88%	5.6895E+17	± 2.99%	2.1148E+16	± 9.35%	1.0752E+18	± 2.09%
975.00	7.0784E+16	± 8.74%	1.2929E+17	± 6.04%	1.5122E+17	± 3.14%	3.4765E+17	± 3.70%	1.1144E+16	± 11.27%	7.1008E+17	± 2.52%
1125.00	3.8610E+16	± 10.55%	1.0243E+17	± 6.62%	1.1196E+17	± 3.53%	2.4164E+17	± 4.44%	7.1361E+15	± 12.63%	5.0178E+17	± 2.90%
1300.00	3.0235E+16	± 9.76%	7.0729E+16	± 6.99%	7.0249E+16	± 3.52%	1.6505E+17	± 4.84%	2.8836E+15	± 13.53%	3.3915E+17	± 3.20%
1500.00	1.5755E+16	± 12.87%	4.2740E+16	± 9.24%	4.5324E+16	± 4.31%	1.0067E+17	± 6.42%	3.4837E+15	± 19.83%	2.0880E+17	± 4.21%
1700.00	1.0575E+16	± 17.40%	2.9542E+16	± 11.59%	2.8480E+16	± 6.31%	5.6960E+16	± 7.13%	2.6332E+15	± 18.32%	1.2910E+17	± 5.25%
1900.00	1.0463E+16	± 20.92%	1.3419E+16	± 16.17%	1.4427E+16	± 8.03%	4.0460E+16	± 9.16%	8.8855E+14	± 26.22%	7.9658E+16	± 6.68%

Table E-167. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-1 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
425.00	2.8785E+17	± 4.71%	7.1544E+17	± 2.90%	7.8555E+17	± 1.69%	3.2218E+18	± 1.69%	1.7179E+17	± 4.37%	5.1824E+18	± 1.25%
500.00	1.4653E+17	± 6.12%	3.3800E+17	± 4.11%	4.2416E+17	± 2.30%	1.4245E+18	± 2.38%	8.4751E+16	± 5.97%	2.4179E+18	± 1.69%
600.00	1.0294E+17	± 6.86%	2.8314E+17	± 4.32%	3.2988E+17	± 2.58%	1.0638E+18	± 2.66%	6.3011E+16	± 7.49%	1.8427E+18	± 1.87%
700.00	9.6024E+16	± 7.56%	2.2644E+17	± 4.61%	2.6901E+17	± 3.34%	7.8591E+17	± 3.03%	4.5714E+16	± 8.01%	1.4231E+18	± 2.11%
825.00	7.1494E+16	± 6.99%	1.8604E+17	± 4.40%	1.9397E+17	± 2.43%	5.4210E+17	± 2.81%	2.8816E+16	± 7.07%	1.0224E+18	± 1.94%
975.00	5.6120E+16	± 7.40%	1.3728E+17	± 5.64%	1.3207E+17	± 2.73%	3.6442E+17	± 3.68%	1.7778E+16	± 9.36%	7.0766E+17	± 2.47%
1125.00	3.5560E+16	± 10.04%	1.0691E+17	± 6.88%	1.0093E+17	± 3.03%	2.3952E+17	± 4.41%	1.0925E+16	± 13.80%	4.9384E+17	± 2.95%
1300.00	2.8573E+16	± 10.03%	6.1207E+16	± 6.17%	6.3597E+16	± 2.89%	1.5485E+17	± 4.62%	7.5639E+15	± 12.31%	3.1579E+17	± 3.02%
1500.00	1.5283E+16	± 12.73%	3.5775E+16	± 8.51%	3.9208E+16	± 4.38%	9.6344E+16	± 5.49%	3.6949E+15	± 13.95%	1.9031E+17	± 3.99%
1700.00	9.8433E+15	± 16.67%	1.9960E+16	± 9.63%	2.4571E+16	± 4.69%	5.7728E+16	± 6.66%	2.9504E+15	± 15.49%	1.1505E+17	± 4.53%
1900.00	6.2536E+15	± 18.06%	1.2256E+16	± 14.81%	1.2810E+16	± 7.28%	3.7794E+16	± 8.35%	1.2345E+15	± 21.87%	7.0349E+16	± 6.00%

Table E-168. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-2 Outer Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
425.00	2.6862E+17	± 5.08%	6.4534E+17	± 3.23%	7.7500E+17	± 2.20%	2.8681E+18	± 1.84%	1.0998E+17	± 6.92%	4.6671E+18	± 1.37%
500.00	1.3804E+17	± 6.20%	3.2155E+17	± 4.24%	4.0993E+17	± 2.77%	1.2796E+18	± 2.50%	4.5349E+16	± 8.21%	2.1944E+18	± 1.79%
600.00	1.0854E+17	± 7.22%	2.7530E+17	± 4.85%	3.0985E+17	± 2.63%	9.6306E+17	± 2.69%	3.2830E+16	± 9.29%	1.6896E+18	± 1.94%
700.00	8.1724E+16	± 8.09%	2.2462E+17	± 5.21%	2.4943E+17	± 2.79%	6.7373E+17	± 3.09%	2.5245E+16	± 9.95%	1.2548E+18	± 2.16%
825.00	7.3562E+16	± 7.40%	1.7462E+17	± 4.98%	1.9317E+17	± 2.72%	4.8307E+17	± 3.16%	1.6301E+16	± 10.00%	9.4073E+17	± 2.16%
975.00	5.4208E+16	± 8.56%	1.1539E+17	± 6.08%	1.3835E+17	± 3.18%	3.2484E+17	± 3.80%	1.0605E+16	± 11.98%	6.4339E+17	± 2.56%
1125.00	3.6613E+16	± 10.77%	9.0838E+16	± 6.68%	9.8065E+16	± 4.19%	2.1738E+17	± 4.80%	6.4983E+15	± 12.37%	4.4939E+17	± 3.14%
1300.00	2.2988E+16	± 11.04%	5.5837E+16	± 7.78%	6.6721E+16	± 4.02%	1.4159E+17	± 5.40%	7.3242E+15	± 13.75%	2.9446E+17	± 3.46%
1500.00	1.7147E+16	± 13.09%	3.3837E+16	± 9.21%	3.8861E+16	± 4.56%	8.4027E+16	± 6.51%	b		1.7681E+17	± 4.23%
1700.00	1.1820E+16	± 15.55%	2.0327E+16	± 13.23%	2.2365E+16	± 7.48%	5.6627E+16	± 6.94%	1.0149E+15	± 19.10%	1.1215E+17	± 5.10%
1900.00	5.1442E+15	± 23.55%	1.0413E+16	± 17.59%	1.2222E+16	± 9.54%	2.7478E+16	± 8.78%	9.2117E+14	± 24.57%	5.6178E+16	± 6.69%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-169. Five-group Photon Spectrum (m^2s^{-1}) in the Slant Cold Guide Tube SCG-2 Inner Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
425.00	2.4264E+17	± 4.53%	6.0487E+17	± 2.96%	7.3749E+17	± 1.99%	2.9560E+18	± 1.72%	1.6794E+17	± 4.39%	4.7089E+18 ± 1.27%
500.00	1.2731E+17	± 6.04%	2.9651E+17	± 3.91%	3.7654E+17	± 2.24%	1.2937E+18	± 2.24%	7.1389E+16	± 6.76%	2.1654E+18 ± 1.62%
600.00	1.0008E+17	± 6.57%	2.5188E+17	± 4.65%	2.8087E+17	± 2.77%	9.7939E+17	± 2.80%	5.5022E+16	± 7.44%	1.6672E+18 ± 1.98%
700.00	7.2952E+16	± 7.18%	2.0406E+17	± 4.95%	2.2856E+17	± 2.73%	6.6438E+17	± 3.53%	4.1451E+16	± 9.07%	1.2114E+18 ± 2.32%
825.00	6.5553E+16	± 7.16%	1.4997E+17	± 4.46%	1.7197E+17	± 2.38%	4.8607E+17	± 3.07%	2.5923E+16	± 8.81%	8.9948E+17 ± 2.08%
975.00	4.7118E+16	± 8.77%	1.1360E+17	± 5.70%	1.2201E+17	± 2.83%	3.1209E+17	± 3.65%	1.7082E+16	± 10.03%	6.1190E+17 ± 2.47%
1125.00	3.3739E+16	± 10.41%	8.6295E+16	± 6.85%	9.3051E+16	± 4.14%	2.0867E+17	± 4.70%	1.0121E+16	± 11.30%	4.3188E+17 ± 3.11%
1300.00	2.3980E+16	± 9.58%	5.3332E+16	± 7.27%	5.8526E+16	± 3.35%	1.3651E+17	± 4.66%	9.0751E+15	± 12.96%	2.8142E+17 ± 3.17%
1500.00	1.6094E+16	± 12.35%	2.9901E+16	± 8.55%	3.5574E+16	± 5.90%	8.0607E+16	± 5.85%	4.6712E+15	± 17.11%	1.6685E+17 ± 3.92%
1700.00	1.1525E+16	± 15.44%	1.6651E+16	± 11.98%	1.9905E+16	± 5.88%	5.0878E+16	± 7.21%	2.0738E+15	± 15.18%	1.0103E+17 ± 4.89%
1900.00	4.0850E+15	± 23.61%	8.9612E+15	± 16.37%	1.1447E+16	± 10.14%	2.9347E+16	± 8.99%	1.4765E+15	± 19.94%	5.5317E+16 ± 6.81%

Table E-170. Five-group Photon Spectrum (m^2s^{-1}) in the Hot Source HS-1 Graphite Shell Half Towards Core. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from HS Centerline	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
-18.75	3.6445E+16	± 25.67%	1.0563E+17	± 15.10%	1.5853E+17	± 11.51%	1.0208E+18	± 7.20%	1.4921E+17	± 15.62%	1.4706E+18 ± 5.78%
-52.50	5.2100E+16	± 13.36%	1.3719E+17	± 7.48%	1.7549E+17	± 6.82%	1.0189E+18	± 3.91%	1.4471E+17	± 9.05%	1.5283E+18 ± 3.23%
-82.50	5.4398E+16	± 8.60%	1.6789E+17	± 4.92%	1.8209E+17	± 4.45%	1.0394E+18	± 2.74%	1.3093E+17	± 7.04%	1.5747E+18 ± 2.32%
-107.50	6.0951E+16	± 6.93%	1.9542E+17	± 4.05%	2.1839E+17	± 3.79%	1.0419E+18	± 2.34%	9.6638E+16	± 7.52%	1.6133E+18 ± 1.91%
-127.50	7.4974E+16	± 5.57%	2.1763E+17	± 3.30%	2.4786E+17	± 2.83%	9.9034E+17	± 1.88%	5.0779E+16	± 7.66%	1.5816E+18 ± 1.50%

Table E-171. Five-group Photon Spectrum (m^2s^{-1}) in the Hot Source HS-1 Graphite Shell Half Away from Core. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from HS Centerline	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
18.75	b	$1.0624\text{E}+17 \pm 15.19\%$	$1.2062\text{E}+17 \pm 12.28\%$	$8.3112\text{E}+17 \pm 7.04\%$	$1.8043\text{E}+17 \pm 18.14\%$	$1.2621\text{E}+18 \pm 5.88\%$
52.50	$3.8943\text{E}+16 \pm 13.82\%$	$1.3080\text{E}+17 \pm 7.77\%$	$1.4579\text{E}+17 \pm 7.36\%$	$8.2480\text{E}+17 \pm 3.93\%$	$1.5779\text{E}+17 \pm 9.57\%$	$1.2981\text{E}+18 \pm 3.31\%$
82.50	$3.8113\text{E}+16 \pm 9.75\%$	$1.2666\text{E}+17 \pm 5.88\%$	$1.4875\text{E}+17 \pm 4.87\%$	$7.3488\text{E}+17 \pm 3.19\%$	$1.2397\text{E}+17 \pm 8.55\%$	$1.1724\text{E}+18 \pm 2.82\%$
107.50	$4.3132\text{E}+16 \pm 8.55\%$	$1.2798\text{E}+17 \pm 4.84\%$	$1.5515\text{E}+17 \pm 4.25\%$	$6.7255\text{E}+17 \pm 3.10\%$	$7.9797\text{E}+16 \pm 7.59\%$	$1.0786\text{E}+18 \pm 2.49\%$
127.50	$4.9013\text{E}+16 \pm 6.89\%$	$1.3000\text{E}+17 \pm 4.06\%$	$1.6601\text{E}+17 \pm 3.33\%$	$5.7904\text{E}+17 \pm 2.31\%$	$4.5852\text{E}+16 \pm 8.29\%$	$9.6992\text{E}+17 \pm 1.84\%$

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-172. Five-group Photon Spectrum (m^2s^{-1}) in the Hot Source HS-1 Outer Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
-116.75	$1.2065\text{E}+17 \pm 3.21\%$	$3.1922\text{E}+17 \pm 1.79\%$	$3.5368\text{E}+17 \pm 1.30\%$	$1.8093\text{E}+18 \pm 0.96\%$	$1.6992\text{E}+17 \pm 2.14\%$	$2.7728\text{E}+18 \pm 0.74\%$
50.00	$6.8840\text{E}+16 \pm 5.13\%$	$1.9522\text{E}+17 \pm 3.73\%$	$2.5218\text{E}+17 \pm 2.34\%$	$8.5466\text{E}+17 \pm 1.87\%$	$6.3569\text{E}+16 \pm 4.61\%$	$1.4345\text{E}+18 \pm 1.38\%$
175.00	$5.1035\text{E}+16 \pm 5.20\%$	$1.3152\text{E}+17 \pm 4.19\%$	$1.6197\text{E}+17 \pm 3.10\%$	$5.7141\text{E}+17 \pm 1.98\%$	$4.4149\text{E}+16 \pm 5.36\%$	$9.6008\text{E}+17 \pm 1.54\%$
325.00	$3.8078\text{E}+16 \pm 6.00\%$	$1.0981\text{E}+17 \pm 4.63\%$	$1.1461\text{E}+17 \pm 3.06\%$	$3.8889\text{E}+17 \pm 2.22\%$	$2.9737\text{E}+16 \pm 6.16\%$	$6.8113\text{E}+17 \pm 1.70\%$
475.00	$2.9404\text{E}+16 \pm 6.06\%$	$7.3287\text{E}+16 \pm 4.18\%$	$9.5982\text{E}+16 \pm 4.80\%$	$3.2046\text{E}+17 \pm 2.61\%$	$2.2797\text{E}+16 \pm 7.31\%$	$5.4193\text{E}+17 \pm 1.99\%$
650.00	$2.5882\text{E}+16 \pm 6.32\%$	$5.7062\text{E}+16 \pm 4.98\%$	$7.6939\text{E}+16 \pm 3.25\%$	$2.3625\text{E}+17 \pm 2.51\%$	$1.5218\text{E}+16 \pm 6.43\%$	$4.1136\text{E}+17 \pm 1.86\%$
825.00	$1.0611\text{E}+16 \pm 7.38\%$	$2.5280\text{E}+16 \pm 5.17\%$	$5.2617\text{E}+16 \pm 3.44\%$	$1.0623\text{E}+17 \pm 2.62\%$	$4.6095\text{E}+15 \pm 7.79\%$	$1.9934\text{E}+17 \pm 1.95\%$

Table E-173. Five-group Photon Spectrum (m^2s^{-1}) in the Hot Source HS-1 Inner Thimble. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) along Comp. Axis	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
-116.75	1.3395E+17	± 2.93%	3.7046E+17	± 1.74%	3.9070E+17	± 1.32%	1.4947E+18	± 1.00%	7.3824E+16	± 2.93%	2.4637E+18	± 0.76%
50.00	8.7193E+16	± 5.16%	2.3394E+17	± 3.25%	2.9917E+17	± 1.86%	7.5762E+17	± 1.85%	3.1171E+16	± 6.48%	1.4091E+18	± 1.30%
175.00	6.1942E+16	± 5.03%	1.6926E+17	± 3.34%	1.8363E+17	± 2.03%	5.2223E+17	± 1.97%	2.1135E+16	± 5.72%	9.5820E+17	± 1.39%
325.00	4.9497E+16	± 5.43%	1.2670E+17	± 3.95%	1.3566E+17	± 2.16%	3.8259E+17	± 2.14%	1.7356E+16	± 6.60%	7.1180E+17	± 1.55%
475.00	3.9175E+16	± 6.13%	9.6175E+16	± 4.99%	1.1591E+17	± 2.61%	3.0829E+17	± 2.38%	1.3938E+16	± 6.23%	5.7348E+17	± 1.76%
650.00	3.3060E+16	± 6.16%	7.5144E+16	± 4.65%	9.4900E+16	± 2.74%	2.4311E+17	± 2.23%	1.0069E+16	± 6.24%	4.5628E+17	± 1.68%
825.00	1.1349E+16	± 6.92%	3.2120E+16	± 5.05%	5.2840E+16	± 3.45%	1.0718E+17	± 2.54%	3.5541E+15	± 7.37%	2.0704E+17	± 1.91%

Table E-174. Five-group Photon Spectrum (m^2s^{-1}) in the Hot Source Miscellaneous Components. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Insulator	7.3109E+16	± 2.96%	2.1854E+17	± 1.81%	2.4412E+17	± 1.50%	6.6510E+17	± 1.18%	1.6958E+16	± 5.78%	1.2178E+18	± 0.87%
Helium (3 atm.)	7.1218E+16	± 3.40%	2.4503E+17	± 2.35%	2.5533E+17	± 1.81%	6.1225E+17	± 1.46%	1.3341E+15	± 18.39%	1.1852E+18	± 1.07%
Helium (1 atm.)	3.2722E+16	± 2.61%	8.3762E+16	± 1.75%	1.0885E+17	± 1.33%	3.2741E+17	± 1.02%	1.3624E+16	± 4.37%	5.6637E+17	± 0.76%
Zircaloy Inner Shell (toward core)	9.0985E+16	± 3.86%	2.9607E+17	± 2.25%	3.0893E+17	± 2.12%	7.8009E+17	± 1.51%	2.4305E+15	± 3.35%	1.4785E+18	± 1.11%
Zircaloy Inner Shell (away from core)	5.3684E+16	± 4.60%	1.7508E+17	± 2.77%	1.9883E+17	± 2.21%	4.4794E+17	± 1.94%	1.5082E+15	± 3.75%	8.7703E+17	± 1.36%
Zircaloy Middle Shell (toward core)	9.4800E+16	± 3.58%	3.1205E+17	± 2.08%	3.1665E+17	± 1.80%	8.1820E+17	± 1.33%	1.8930E+15	± 3.31%	1.5436E+18	± 1.01%
Zircaloy Middle Shell (away from core)	5.0936E+16	± 4.56%	1.7369E+17	± 2.93%	1.9693E+17	± 2.13%	4.1725E+17	± 1.71%	8.3464E+14	± 4.48%	8.3965E+17	± 1.27%
Zircaloy Outer Shell (toward core)	1.0019E+17	± 4.32%	3.1202E+17	± 2.10%	3.2916E+17	± 1.71%	1.0116E+18	± 1.20%	8.3643E+15	± 2.19%	1.7613E+18	± 0.93%
Zircaloy Outer Shell (away from core)	5.3091E+16	± 4.69%	1.6629E+17	± 2.90%	1.9045E+17	± 1.90%	4.4680E+17	± 1.71%	2.6396E+15	± 3.39%	8.5928E+17	± 1.22%

Table E-175. Five-group Photon Spectrum (m^2s^{-1}) in the Reflector Vessel Side Wall. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)			Group 2 (2.225 - 6.0 MeV)			Group 3 (1.0 - 2.225 MeV)			Group 4 (50 keV - 1.0 MeV)			Group 5 (Below 50 keV)			Total		
2255.40	1.7792E+15	±	6.64%	4.8686E+15	±	4.15%	5.6591E+15	±	2.58%	1.6211E+16	±	2.43%	2.8115E+14	±	7.15%	2.8799E+16	±	2.04%
2090.00	2.7051E+15	±	5.55%	6.7192E+15	±	3.57%	7.6590E+15	±	2.21%	2.1615E+16	±	2.11%	3.7741E+14	±	5.88%	3.9075E+16	±	1.74%
1940.00	3.4422E+15	±	3.11%	8.0968E+15	±	2.25%	1.0144E+16	±	1.28%	2.7344E+16	±	1.29%	4.3561E+14	±	3.52%	4.9463E+16	±	1.09%
1737.00	2.9006E+15	±	3.13%	6.5741E+15	±	2.22%	8.7817E+15	±	1.23%	2.3766E+16	±	1.25%	3.9224E+14	±	3.28%	4.2414E+16	±	1.06%
1552.50	2.7023E+15	±	5.54%	5.9172E+15	±	3.93%	1.0266E+16	±	2.25%	2.4434E+16	±	1.95%	8.4120E+14	±	5.02%	4.4162E+16	±	1.56%
1345.00	4.9066E+15	±	4.69%	9.2936E+15	±	3.22%	1.6348E+16	±	1.83%	3.5157E+16	±	1.72%	1.2096E+15	±	4.24%	6.6915E+16	±	1.33%
1145.00	6.2081E+15	±	4.03%	1.3437E+16	±	2.66%	2.4233E+16	±	1.60%	4.8671E+16	±	1.44%	1.6634E+15	±	3.74%	9.4212E+16	±	1.12%
945.00	8.0004E+15	±	3.58%	1.7631E+16	±	2.31%	3.0963E+16	±	1.36%	6.4554E+16	±	1.27%	2.2176E+15	±	3.27%	1.2337E+17	±	0.98%
795.00	1.0051E+16	±	4.16%	2.2306E+16	±	2.68%	3.8137E+16	±	1.60%	7.9667E+16	±	1.44%	2.8398E+15	±	4.02%	1.5300E+17	±	1.09%
695.00	1.1534E+16	±	3.96%	2.4738E+16	±	2.59%	4.3368E+16	±	1.50%	9.1029E+16	±	1.37%	3.1995E+15	±	3.78%	1.7387E+17	±	1.04%
595.00	1.2952E+16	±	3.40%	2.8199E+16	±	2.38%	4.7473E+16	±	1.44%	1.0625E+17	±	1.28%	3.6834E+15	±	3.38%	1.9855E+17	±	0.97%
495.00	1.4345E+16	±	3.25%	3.1755E+16	±	2.22%	5.5339E+16	±	1.34%	1.2413E+17	±	1.18%	4.1738E+15	±	3.35%	2.2975E+17	±	0.90%
395.00	1.5710E+16	±	3.04%	3.5550E+16	±	2.06%	6.2441E+16	±	1.24%	1.3978E+17	±	1.11%	4.9786E+15	±	3.14%	2.5846E+17	±	0.84%
295.00	1.6468E+16	±	3.17%	3.8751E+16	±	2.09%	6.4924E+16	±	1.26%	1.5247E+17	±	1.14%	4.8898E+15	±	3.14%	2.7750E+17	±	0.86%
195.00	1.8335E+16	±	3.07%	4.1496E+16	±	2.08%	6.8170E+16	±	1.28%	1.6373E+17	±	1.11%	5.3390E+15	±	3.08%	2.9707E+17	±	0.84%
115.00	1.9107E+16	±	3.57%	4.2911E+16	±	2.43%	7.1477E+16	±	1.52%	1.6990E+17	±	1.33%	5.5680E+15	±	3.95%	3.0896E+17	±	0.98%
65.00	1.9099E+16	±	4.46%	4.4873E+16	±	2.92%	7.2253E+16	±	1.73%	1.7065E+17	±	1.53%	5.4027E+15	±	4.91%	3.1228E+17	±	1.13%
22.50	1.8909E+16	±	4.06%	4.5430E+16	±	2.79%	7.2529E+16	±	1.68%	1.7294E+17	±	1.46%	5.7681E+15	±	4.89%	3.1558E+17	±	1.08%
-22.50	1.8661E+16	±	4.60%	4.3475E+16	±	2.76%	7.3410E+16	±	1.64%	1.7832E+17	±	1.50%	6.0371E+15	±	4.62%	3.1990E+17	±	1.10%
-65.00	1.9578E+16	±	4.23%	4.4567E+16	±	2.80%	7.4714E+16	±	1.72%	1.8108E+17	±	1.58%	5.8369E+15	±	4.70%	3.2577E+17	±	1.15%
-115.00	1.8609E+16	±	3.56%	4.4568E+16	±	2.40%	7.2601E+16	±	1.41%	1.7768E+17	±	1.31%	5.9958E+15	±	4.13%	3.1945E+17	±	0.97%
-195.00	1.8077E+16	±	3.06%	4.2552E+16	±	2.03%	7.0073E+16	±	1.21%	1.7035E+17	±	1.07%	5.7685E+15	±	2.98%	3.0682E+17	±	0.81%
-295.00	1.8474E+16	±	2.96%	3.9882E+16	±	2.08%	7.0299E+16	±	1.22%	1.6392E+17	±	1.08%	5.2743E+15	±	3.12%	2.9785E+17	±	0.82%
-395.00	1.6746E+16	±	3.03%	4.0494E+16	±	1.97%	6.7307E+16	±	1.17%	1.5639E+17	±	1.09%	5.2301E+15	±	2.94%	2.8617E+17	±	0.82%
-495.00	1.5755E+16	±	3.19%	3.4830E+16	±	2.17%	6.0598E+16	±	1.25%	1.3161E+17	±	1.13%	4.7194E+15	±	3.36%	2.4751E+17	±	0.87%
-595.00	1.3180E+16	±	3.47%	3.1628E+16	±	2.21%	5.5572E+16	±	1.36%	1.1440E+17	±	1.20%	3.9007E+15	±	3.18%	2.1869E+17	±	0.91%
-695.00	1.2124E+16	±	3.74%	2.9637E+16	±	2.35%	5.0050E+16	±	1.38%	1.0523E+17	±	1.27%	3.6615E+15	±	3.54%	2.0070E+17	±	0.97%
-795.00	1.2005E+16	±	3.75%	2.5368E+16	±	2.47%	4.7073E+16	±	1.45%	9.4533E+16	±	1.37%	3.1912E+15	±	3.69%	1.8217E+17	±	1.03%
-945.00	1.0152E+16	±	3.18%	2.2360E+16	±	2.14%	3.8586E+16	±	1.21%	7.7397E+16	±	1.17%	2.5875E+15	±	2.94%	1.5108E+17	±	0.90%
-1145.00	7.1660E+15	±	3.75%	1.7118E+16	±	2.42%	2.8117E+16	±	1.41%	5.8762E+16	±	1.32%	1.9818E+15	±	3.45%	1.1314E+17	±	1.03%
-1307.50	5.1285E+15	±	5.17%	1.1867E+16	±	3.25%	1.9322E+16	±	2.04%	4.6568E+16	±	1.73%	1.5062E+15	±	4.78%	8.4392E+16	±	1.36%
-1446.50	9.0499E+15	±	3.27%	2.0283E+16	±	2.21%	2.5767E+16	±	1.18%	7.5061E+16	±	1.22%	1.1766E+15	±	3.13%	1.3134E+17	±	1.04%
-1672.00	1.1082E+16	±	2.60%	2.5478E+16	±	1.75%	3.1367E+16	±	1.01%	8.6121E+16	±	1.02%	1.3420E+15	±	2.65%	1.5539E+17	±	0.86%
-1800.00	1.1629E+16	±	2.51%	2.7206E+16	±	1.67%	3.1916E+16	±	1.00%	8.7729E+16	±	1.03%	1.4493E+15	±	2.94%	1.5993E+17	±	0.85%
-1950.00	1.0130E+16	±	1.85%	2.4527E+16	±	1.26%	3.0958E+16	±	0.68%	8.2849E+16	±	0.73%	1.2486E+15	±	1.85%	1.4971E+17	±	0.62%
-2076.90	6.7057E+15	±	2.08%	1.6282E+16	±	1.38%	2.0181E+16	±	0.80%	5.5116E+16	±	0.80%	8.5983E+14	±	2.08%	9.9145E+16	±	0.70%

Table E-176. Five-group Photon Spectrum (m^2s^{-1}) in the Reflector Vessel Top. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from Centerline	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
253.0	$1.3650\text{E}+15 \pm 19.70\%$	$3.6666\text{E}+15 \pm 12.39\%$	$4.8067\text{E}+15 \pm 9.25\%$	$1.4110\text{E}+16 \pm 7.03\%$	$1.5722\text{E}+14 \pm 18.34\%$	$2.4106\text{E}+16 \pm 6.06\%$
476.25	$1.3346\text{E}+15 \pm 11.37\%$	$2.8910\text{E}+15 \pm 8.28\%$	$4.2831\text{E}+15 \pm 4.10\%$	$1.3446\text{E}+16 \pm 4.34\%$	$2.1780\text{E}+14 \pm 12.33\%$	$2.2173\text{E}+16 \pm 3.48\%$
723.9	$1.4146\text{E}+15 \pm 8.75\%$	$3.8168\text{E}+15 \pm 5.87\%$	$4.6384\text{E}+15 \pm 3.39\%$	$1.4067\text{E}+16 \pm 3.27\%$	$2.0011\text{E}+14 \pm 7.97\%$	$2.4137\text{E}+16 \pm 2.72\%$

Table E-177. Five-group Photon Spectrum (m^2s^{-1}) in the Reflector Vessel Bottom. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Radius (mm) from Centerline	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
253.0	$8.1445\text{E}+15 \pm 7.87\%$	$1.8593\text{E}+16 \pm 5.09\%$	$2.2078\text{E}+16 \pm 2.98\%$	$6.8517\text{E}+16 \pm 2.74\%$	$1.0649\text{E}+15 \pm 8.18\%$	$1.1840\text{E}+17 \pm 2.35\%$
476.25	$7.9939\text{E}+15 \pm 4.72\%$	$1.7084\text{E}+16 \pm 3.28\%$	$2.1891\text{E}+16 \pm 1.90\%$	$6.7314\text{E}+16 \pm 1.79\%$	$1.0395\text{E}+15 \pm 5.07\%$	$1.1532\text{E}+17 \pm 1.53\%$

Table E-178. Four-group Neutron Spectrum in the primary system heavy water. Normalized to 330 MWf, with relative errors shown. Cell locations are shown in Figures D-1 and D-2.

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
104	2.7692E+15	± 12.16%	9.4896E+15	± 7.58%	9.0406E+15	± 5.92%	5.6733E+16	± 3.42%	7.0206E+15	± 7.82%	8.5053E+16	± 2.99%
105	3.3733E+15	± 23.26%	9.0807E+15	± 9.85%	9.8973E+15	± 9.65%	6.0112E+16	± 3.96%	7.1384E+15	± 9.82%	8.9602E+16	± 3.49%
106	2.9106E+15	± 11.17%	9.4715E+15	± 6.03%	9.9788E+15	± 4.65%	5.7742E+16	± 3.01%	5.8592E+15	± 6.80%	8.5962E+16	± 2.61%
110	3.4085E+15	± 10.94%	1.0214E+16	± 7.66%	1.1939E+16	± 6.94%	5.3911E+16	± 3.73%	3.0957E+15	± 14.97%	8.2569E+16	± 3.16%
125	7.3184E+15	± 9.84%	4.8250E+16	± 4.80%	5.5620E+16	± 4.02%	3.3591E+17	± 2.16%	3.5055E+16	± 5.32%	4.8216E+17	± 1.89%
126	7.7515E+15	± 12.30%	5.1679E+16	± 6.28%	5.9459E+16	± 5.34%	3.7116E+17	± 2.61%	3.8117E+16	± 6.22%	5.2817E+17	± 2.22%
127	7.8050E+15	± 7.80%	5.2457E+16	± 4.05%	6.2798E+16	± 3.15%	3.5699E+17	± 1.79%	3.2510E+16	± 4.51%	5.1256E+17	± 1.56%
132	8.0142E+15	± 9.71%	4.8993E+16	± 4.79%	6.4204E+16	± 3.67%	3.2499E+17	± 2.09%	1.6384E+16	± 9.50%	4.6258E+17	± 1.78%
145	3.1194E+16	± 4.74%	2.9318E+17	± 1.88%	3.9305E+17	± 1.53%	2.1074E+18	± 0.87%	2.1593E+17	± 2.07%	3.0407E+18	± 0.76%
146	3.3107E+16	± 5.95%	2.8645E+17	± 2.71%	3.8492E+17	± 2.14%	2.1869E+18	± 1.04%	2.3639E+17	± 2.64%	3.1278E+18	± 0.89%
147	3.5939E+16	± 3.77%	2.8607E+17	± 1.59%	3.8645E+17	± 1.29%	2.1387E+18	± 0.73%	1.9985E+17	± 1.78%	3.0470E+18	± 0.64%
152	4.0677E+16	± 4.61%	3.0190E+17	± 1.92%	3.9654E+17	± 1.54%	1.9239E+18	± 0.92%	8.9172E+16	± 3.59%	2.7521E+18	± 0.77%
168	1.4833E+17	± 2.17%	1.7070E+18	± 0.76%	2.8281E+18	± 0.57%	1.6449E+19	± 0.31%	1.1638E+18	± 0.92%	2.2297E+19	± 0.28%
169	1.3986E+17	± 3.46%	1.2414E+18	± 1.22%	2.1252E+18	± 1.01%	1.4238E+19	± 0.43%	1.2394E+18	± 1.23%	1.8984E+19	± 0.39%
170	1.6380E+17	± 1.73%	1.3638E+18	± 0.74%	2.3606E+18	± 0.52%	1.5532E+19	± 0.27%	1.0487E+18	± 0.80%	2.0469E+19	± 0.25%
177	2.0790E+17	± 2.25%	1.1780E+18	± 0.97%	1.8235E+18	± 0.72%	1.1489E+19	± 0.39%	4.8127E+17	± 1.47%	1.5180E+19	± 0.33%
214	7.0437E+17	± 1.09%	9.6047E+18	± 0.35%	2.0203E+19	± 0.22%	1.0416E+20	± 0.13%	1.6229E+18	± 0.75%	1.3629E+20	± 0.11%
228	5.0075E+17	± 1.25%	7.9515E+18	± 0.39%	1.8459E+19	± 0.25%	8.4539E+19	± 0.14%	8.7587E+17	± 1.08%	1.1233E+20	± 0.12%
258	5.0354E+17	± 1.06%	6.8632E+18	± 0.25%	1.6797E+19	± 0.16%	7.7808E+19	± 0.11%	8.4591E+17	± 0.88%	1.0282E+20	± 0.10%
303	7.0477E+17	± 2.29%	6.9921E+18	± 0.80%	1.5772E+19	± 0.51%	1.0459E+20	± 0.25%	2.2843E+18	± 1.53%	1.3034E+20	± 0.22%
306	6.3088E+17	± 2.10%	6.9772E+18	± 0.67%	1.5997E+19	± 0.42%	9.6279E+19	± 0.24%	2.0933E+18	± 1.47%	1.2198E+20	± 0.20%
308	7.0644E+17	± 3.15%	5.9785E+18	± 1.19%	1.3112E+19	± 0.77%	7.9835E+19	± 0.40%	1.4040E+18	± 2.65%	1.0104E+20	± 0.35%
403	6.5273E+17	± 2.39%	7.2513E+18	± 0.77%	1.6819E+19	± 0.50%	1.0957E+20	± 0.26%	2.0698E+18	± 1.83%	1.3636E+20	± 0.23%
406	6.2307E+17	± 1.89%	6.0624E+18	± 0.67%	1.3663E+19	± 0.43%	9.0859E+19	± 0.22%	2.7037E+18	± 1.19%	1.1391E+20	± 0.20%
408	7.5110E+17	± 2.94%	4.9877E+18	± 1.22%	1.0438E+19	± 0.81%	7.2610E+19	± 0.39%	1.7476E+18	± 2.13%	9.0535E+19	± 0.34%
528	6.4237E+17	± 1.03%	8.7864E+18	± 0.29%	2.1730E+19	± 0.18%	1.0352E+20	± 0.12%	1.6487E+18	± 0.88%	1.3633E+20	± 0.11%
542	6.1953E+17	± 1.94%	5.7063E+18	± 0.72%	1.2794E+19	± 0.47%	8.7667E+19	± 0.23%	2.9989E+18	± 1.16%	1.0979E+20	± 0.21%
543	5.2412E+17	± 0.62%	3.9315E+18	± 0.24%	8.5778E+18	± 0.15%	5.2557E+19	± 0.09%	1.8081E+18	± 0.36%	6.7399E+19	± 0.08%
558	7.7078E+17	± 0.92%	4.5054E+18	± 0.31%	9.1337E+18	± 0.19%	6.1700E+19	± 0.12%	1.7267E+18	± 0.62%	7.7836E+19	± 0.11%
608	4.4247E+17	± 1.22%	1.7160E+18	± 0.75%	2.8145E+18	± 0.55%	1.9799E+19	± 0.29%	1.2372E+18	± 0.87%	2.6009E+19	± 0.26%
610	4.5192E+17	± 1.39%	1.5677E+18	± 0.85%	2.3954E+18	± 0.67%	1.6885E+19	± 0.35%	9.2527E+17	± 1.25%	2.2225E+19	± 0.30%
611	5.0528E+17	± 2.33%	4.5971E+18	± 0.88%	1.0560E+19	± 0.57%	5.9976E+19	± 0.32%	1.5796E+18	± 1.83%	7.7218E+19	± 0.28%
625	5.0376E+17	± 1.31%	1.6244E+18	± 0.70%	2.3889E+18	± 0.44%	1.4517E+19	± 0.31%	5.9379E+17	± 1.18%	1.9628E+19	± 0.26%
645	1.9087E+17	± 1.68%	4.7103E+17	± 1.16%	5.4533E+17	± 0.81%	2.7517E+18	± 0.60%	2.1567E+17	± 1.67%	4.1745E+18	± 0.50%
650	1.6153E+17	± 1.61%	3.8523E+17	± 1.11%	4.4108E+17	± 0.75%	2.0917E+18	± 0.58%	1.5990E+17	± 1.67%	3.2394E+18	± 0.48%
655	1.9850E+17	± 2.05%	4.7851E+17	± 1.32%	5.4026E+17	± 0.80%	2.1253E+18	± 0.68%	1.0634E+17	± 2.40%	3.4489E+18	± 0.53%
665	5.8593E+16	± 3.03%	1.3928E+17	± 2.10%	1.4881E+17	± 1.30%	6.5224E+17	± 1.11%	4.5709E+16	± 2.91%	1.0446E+18	± 0.91%
670	5.9198E+16	± 2.60%	1.2800E+17	± 1.79%	1.3863E+17	± 1.13%	5.7171E+17	± 0.94%	4.1492E+16	± 2.63%	9.3902E+17	± 0.78%
675	6.4033E+16	± 3.35%	1.3766E+17	± 2.37%	1.5684E+17	± 1.37%	5.1700E+17	± 1.26%	2.4837E+16	± 4.05%	9.0037E+17	± 0.96%
684	1.7168E+16	± 5.49%	3.8541E+16	± 3.63%	4.1386E+16	± 2.04%	1.9337E+17	± 1.93%	1.5133E+16	± 5.09%	3.0559E+17	± 1.59%
688	1.8303E+16	± 4.62%	3.8340E+16	± 3.13%	4.0346E+16	± 2.03%	1.6879E+17	± 1.58%	1.2551E+16	± 4.51%	2.7833E+17	± 1.34%
692	2.2634E+16	± 6.87%	4.0779E+16	± 4.01%	4.5346E+16	± 2.31%	1.5855E+17	± 2.04%	7.7554E+15	± 7.18%	2.7506E+17	± 1.64%

Table E-179. Four-group Neutron Spectrum in the primary system heavy water in central control rod 1. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Center of CCR	1.0670E+17	± 4.18%	2.3029E+18	± 1.01%	3.4664E+18	± 0.81%	6.8878E+18	± 0.67%	5.5548E+16	± 6.93%	1.2819E+19	± 0.48%
Inside hafnium	1.9588E+17	± 3.68%	4.9066E+18	± 0.90%	7.1391E+18	± 0.71%	1.1005E+19	± 0.61%	4.0143E+16	± 5.56%	2.3287E+19	± 0.45%
Along hafnium outside	1.9772E+17	± 2.59%	3.7498E+18	± 0.58%	5.9661E+18	± 0.45%	1.9641E+19	± 0.29%	4.8233E+17	± 1.65%	3.0037E+19	± 0.24%
Below hafnium outside	3.4386E+17	± 1.23%	3.0903E+18	± 0.50%	6.8231E+18	± 0.32%	4.0823E+19	± 0.17%	8.5724E+17	± 0.89%	5.1938E+19	± 0.15%
Above hafnium outside	4.8677E+15	± 15.60%	2.0517E+16	± 10.12%	1.9539E+16	± 7.63%	1.0680E+17	± 4.85%	8.0230E+15	± 15.28%	1.5975E+17	± 3.95%
Center of support tube	3.5432E+17	± 1.97%	2.8391E+18	± 0.83%	6.1184E+18	± 0.55%	3.9490E+19	± 0.27%	7.2585E+17	± 1.67%	4.9528E+19	± 0.25%

Table E-180. Four-group Neutron Spectrum in the primary system heavy water in central control rod 2. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Center of CCR	1.0557E+17	± 4.09%	2.2640E+18	± 1.04%	3.3869E+18	± 0.81%	6.8969E+18	± 0.68%	4.7517E+16	± 6.63%	1.2701E+19	± 0.49%
Inside hafnium	1.8637E+17	± 3.69%	4.8752E+18	± 0.89%	6.9234E+18	± 0.70%	1.0896E+19	± 0.60%	4.8572E+16	± 7.11%	2.2929E+19	± 0.44%
Along hafnium outside	1.9801E+17	± 2.24%	3.7163E+18	± 0.58%	5.8477E+18	± 0.45%	1.9467E+19	± 0.30%	4.4793E+17	± 1.67%	2.9677E+19	± 0.24%
Below hafnium outside	3.3258E+17	± 1.27%	3.0642E+18	± 0.50%	6.7910E+18	± 0.32%	4.0898E+19	± 0.17%	8.6960E+17	± 0.90%	5.1956E+19	± 0.15%
Above hafnium outside	3.9807E+15	± 16.04%	1.6918E+16	± 11.83%	2.0383E+16	± 8.17%	1.0686E+17	± 4.44%	5.8435E+15	± 14.07%	1.5399E+17	± 3.86%
Center of support tube	3.5267E+17	± 2.05%	2.8225E+18	± 0.85%	6.0403E+18	± 0.55%	3.9477E+19	± 0.27%	7.3946E+17	± 1.74%	4.9432E+19	± 0.25%

Table E-181. Four-group Neutron Spectrum in the primary system heavy water in central control rod 3. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Center of CCR	1.1403E+17	± 4.09%	2.3311E+18	± 1.01%	3.4510E+18	± 0.81%	7.0252E+18	± 0.66%	5.4033E+16	± 6.35%	1.2975E+19	± 0.48%
Inside hafnium	2.0412E+17	± 3.78%	5.0314E+18	± 0.90%	7.1148E+18	± 0.72%	1.1143E+19	± 0.58%	4.8681E+16	± 8.03%	2.3542E+19	± 0.44%
Along hafnium outside	1.9643E+17	± 2.29%	3.7930E+18	± 0.57%	5.9483E+18	± 0.44%	1.9832E+19	± 0.29%	4.6826E+17	± 1.66%	3.0238E+19	± 0.24%
Below hafnium outside	3.3684E+17	± 1.24%	3.0812E+18	± 0.50%	6.8503E+18	± 0.31%	4.0883E+19	± 0.16%	8.6055E+17	± 0.89%	5.2012E+19	± 0.15%
Above hafnium outside	4.1344E+15	± 17.48%	1.8632E+16	± 13.47%	2.0415E+16	± 9.11%	1.1445E+17	± 4.46%	5.5686E+15	± 12.21%	1.6320E+17	± 3.97%
Center of support tube	3.6456E+17	± 2.08%	2.8467E+18	± 0.83%	6.1212E+18	± 0.55%	3.9231E+19	± 0.27%	7.4468E+17	± 1.74%	4.9308E+19	± 0.25%

Table E-182. Four-group Neutron Spectrum in the reflector heavy water. Normalized to 330 MWf, with relative errors shown. Cell locations are shown in Figures D-3 through D-10.

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
2001	6.3476E+15	± 2.33%	2.7835E+16	± 1.35%	3.5087E+16	± 1.01%	2.1528E+17	± 0.57%	3.5821E+16	± 0.86%	3.2037E+17	± 0.54%
2011	5.6472E+15	± 3.39%	2.5588E+16	± 1.90%	3.3315E+16	± 1.43%	2.0719E+17	± 0.78%	3.4894E+16	± 1.22%	3.0663E+17	± 0.73%
2021	5.9553E+15	± 3.20%	2.6647E+16	± 1.80%	3.2849E+16	± 1.39%	2.1399E+17	± 0.77%	3.6157E+16	± 1.18%	3.1560E+17	± 0.71%
2031	8.1061E+15	± 2.64%	3.3085E+16	± 1.56%	4.1247E+16	± 1.21%	2.4297E+17	± 0.70%	3.9465E+16	± 1.13%	3.6487E+17	± 0.65%
2041	5.9876E+15	± 3.24%	2.7137E+16	± 1.85%	3.4689E+16	± 1.40%	2.1378E+17	± 0.75%	3.7003E+16	± 1.18%	3.1859E+17	± 0.71%
2051	6.5131E+15	± 2.28%	2.7757E+16	± 1.33%	3.4331E+16	± 1.01%	2.1589E+17	± 0.56%	3.5821E+16	± 0.85%	3.2031E+17	± 0.53%
2061	3.9200E+15	± 2.68%	7.8771E+15	± 2.00%	9.8012E+15	± 1.38%	5.3667E+16	± 0.89%	9.0284E+15	± 1.35%	8.4293E+16	± 0.83%
2071	3.2842E+15	± 3.89%	6.2435E+15	± 3.07%	8.8289E+15	± 2.10%	4.6752E+16	± 1.29%	7.9293E+15	± 2.05%	7.3037E+16	± 1.21%
2081	3.1464E+15	± 4.01%	6.4137E+15	± 2.98%	8.4267E+15	± 2.06%	4.6492E+16	± 1.29%	7.8342E+15	± 2.00%	7.2313E+16	± 1.19%
2091	4.0811E+15	± 3.60%	7.8350E+15	± 2.72%	1.0247E+16	± 1.88%	5.9461E+16	± 1.18%	1.0062E+16	± 1.74%	9.1686E+16	± 1.08%
2101	3.2115E+15	± 4.07%	6.1861E+15	± 3.17%	8.4247E+15	± 2.12%	4.6343E+16	± 1.31%	7.9285E+15	± 2.03%	7.2094E+16	± 1.22%
2111	4.1187E+15	± 2.64%	8.1616E+15	± 1.94%	1.0141E+16	± 1.33%	5.7173E+16	± 0.85%	9.5869E+15	± 1.29%	8.9182E+16	± 0.79%
2201	1.3989E+17	± 1.90%	1.0669E+18	± 0.80%	1.9965E+18	± 0.54%	1.5706E+19	± 0.28%	1.7554E+18	± 0.61%	2.0664E+19	± 0.26%
2211	1.3327E+17	± 1.85%	1.0731E+18	± 0.79%	1.9828E+18	± 0.54%	1.6043E+19	± 0.28%	1.8347E+18	± 0.59%	2.1067E+19	± 0.26%
2221	1.1744E+17	± 2.03%	1.0331E+18	± 0.80%	1.9917E+18	± 0.55%	1.6014E+19	± 0.28%	1.9365E+18	± 0.58%	2.1093E+19	± 0.26%
2231	1.4450E+17	± 1.85%	1.0588E+18	± 0.80%	1.9484E+18	± 0.54%	1.5275E+19	± 0.29%	1.6099E+18	± 0.63%	2.0036E+19	± 0.26%
2241	3.0625E+17	± 3.93%	4.1482E+18	± 1.21%	9.6696E+18	± 0.75%	5.9766E+19	± 0.41%	3.1750E+18	± 1.69%	7.7065E+19	± 0.37%
2242	3.3536E+17	± 3.87%	4.2539E+18	± 1.19%	9.9014E+18	± 0.75%	6.1463E+19	± 0.42%	3.2130E+18	± 1.60%	7.9167E+19	± 0.37%
2243	2.9098E+17	± 4.02%	4.0699E+18	± 1.21%	9.7913E+18	± 0.76%	6.1337E+19	± 0.42%	3.3613E+18	± 1.57%	7.8851E+19	± 0.36%
2244	3.6159E+17	± 3.60%	4.1084E+18	± 1.20%	9.5038E+18	± 0.76%	5.7276E+19	± 0.42%	2.7338E+18	± 1.77%	7.3983E+19	± 0.37%
2245	4.0083E+17	± 2.98%	4.8685E+18	± 0.91%	1.1350E+19	± 0.58%	6.9270E+19	± 0.34%	3.5440E+18	± 1.30%	8.9434E+19	± 0.29%
2246	3.8259E+17	± 3.09%	5.0160E+18	± 0.92%	1.1687E+19	± 0.58%	7.1013E+19	± 0.34%	3.6067E+18	± 1.26%	9.1705E+19	± 0.30%
2247	3.5634E+17	± 3.14%	4.8854E+18	± 0.92%	1.1522E+19	± 0.58%	7.0714E+19	± 0.33%	3.9178E+18	± 1.26%	9.1396E+19	± 0.30%
2248	5.5379E+17	± 2.57%	4.8081E+18	± 0.92%	1.1006E+19	± 0.59%	6.6450E+19	± 0.34%	3.0476E+18	± 1.41%	8.5866E+19	± 0.29%
2249	4.7115E+17	± 3.22%	5.4134E+18	± 1.07%	1.2507E+19	± 0.67%	7.5034E+19	± 0.37%	3.8636E+18	± 1.51%	9.7290E+19	± 0.33%
2250	4.5933E+17	± 3.42%	5.3820E+18	± 1.06%	1.2714E+19	± 0.67%	7.6396E+19	± 0.37%	3.8187E+18	± 1.48%	9.8770E+19	± 0.33%
2251	3.7867E+17	± 3.45%	5.3280E+18	± 1.07%	1.2629E+19	± 0.67%	7.6092E+19	± 0.37%	4.2082E+18	± 1.45%	9.8635E+19	± 0.33%
2252	6.8663E+17	± 2.68%	5.2705E+18	± 1.04%	1.1911E+19	± 0.67%	7.2064E+19	± 0.37%	3.2157E+18	± 1.62%	9.3148E+19	± 0.32%
2253	2.7308E+17	± 4.29%	2.9644E+18	± 1.34%	6.6944E+18	± 0.86%	4.9787E+19	± 0.45%	4.0514E+18	± 1.55%	6.3771E+19	± 0.40%
2254	3.0291E+17	± 4.29%	3.0278E+18	± 1.35%	6.8777E+18	± 0.87%	5.0798E+19	± 0.45%	4.1021E+18	± 1.53%	6.5108E+19	± 0.40%
2255	2.1345E+17	± 4.43%	2.9352E+18	± 1.34%	6.7947E+18	± 0.86%	5.0823E+19	± 0.45%	4.3158E+18	± 1.45%	6.5082E+19	± 0.40%
2256	3.3758E+17	± 3.98%	3.0031E+18	± 1.39%	6.6103E+18	± 0.88%	4.7514E+19	± 0.47%	3.4397E+18	± 1.68%	6.0904E+19	± 0.42%
2257	3.6151E+17	± 3.12%	3.5578E+18	± 1.01%	8.0229E+18	± 0.65%	5.8015E+19	± 0.36%	4.5062E+18	± 1.21%	7.4463E+19	± 0.32%
2258	3.2684E+17	± 3.28%	3.6040E+18	± 1.02%	8.1820E+18	± 0.65%	5.9053E+19	± 0.36%	4.6487E+18	± 1.19%	7.5815E+19	± 0.32%
2259	2.9173E+17	± 3.27%	3.4659E+18	± 1.02%	7.9313E+18	± 0.65%	5.8858E+19	± 0.36%	5.0163E+18	± 1.16%	7.5563E+19	± 0.32%
2260	5.2723E+17	± 2.82%	3.5258E+18	± 1.04%	7.7577E+18	± 0.67%	5.5415E+19	± 0.37%	3.8211E+18	± 1.33%	7.1047E+19	± 0.33%
2261	4.4078E+17	± 3.37%	3.8671E+18	± 1.19%	8.6016E+18	± 0.76%	6.2086E+19	± 0.41%	4.7940E+18	± 1.41%	7.9789E+19	± 0.36%
2262	3.6789E+17	± 3.58%	3.9391E+18	± 1.19%	8.7700E+18	± 0.76%	6.4241E+19	± 0.40%	5.0630E+18	± 1.39%	8.2381E+19	± 0.36%
2263	3.2315E+17	± 3.61%	3.7515E+18	± 1.18%	8.5760E+18	± 0.74%	6.3112E+19	± 0.40%	5.2324E+18	± 1.31%	8.0996E+19	± 0.36%
2264	6.4431E+17	± 2.92%	3.9646E+18	± 1.19%	8.4028E+18	± 0.78%	5.9678E+19	± 0.42%	3.9647E+18	± 1.52%	7.6655E+19	± 0.37%
2265	2.4767E+17	± 4.21%	2.3310E+18	± 1.47%	5.0526E+18	± 0.95%	4.2270E+19	± 0.48%	4.2230E+18	± 1.47%	5.4124E+19	± 0.43%
2266	2.4849E+17	± 4.19%	2.3168E+18	± 1.44%	5.1954E+18	± 0.94%	4.2583E+19	± 0.47%	4.3343E+18	± 1.42%	5.4678E+19	± 0.42%
2267	1.9056E+17	± 4.37%	2.3288E+18	± 1.44%	5.1232E+18	± 0.92%	4.3121E+19	± 0.46%	4.6535E+18	± 1.36%	5.5417E+19	± 0.42%

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
2268	3.1689E+17	4.32%	2.3424E+18	1.60%	5.0607E+18	1.03%	4.0473E+19	0.51%	3.7595E+18	1.61%	5.1952E+19	0.45%
2269	3.2994E+17	3.27%	2.8199E+18	1.10%	6.1262E+18	0.71%	4.9229E+19	0.38%	4.8353E+18	1.16%	6.3340E+19	0.34%
2270	2.8636E+17	3.25%	2.7724E+18	1.09%	6.1604E+18	0.70%	4.9975E+19	0.38%	4.9494E+18	1.12%	6.4144E+19	0.34%
2271	2.4308E+17	3.32%	2.6713E+18	1.06%	6.0430E+18	0.69%	5.0105E+19	0.37%	5.2625E+18	1.06%	6.4325E+19	0.33%
2272	4.8635E+17	3.18%	2.7773E+18	1.20%	5.9340E+18	0.79%	4.6912E+19	0.41%	4.1741E+18	1.29%	6.0283E+19	0.37%
2273	4.0419E+17	3.60%	3.0196E+18	1.29%	6.5089E+18	0.84%	5.2731E+19	0.43%	5.1008E+18	1.33%	6.7764E+19	0.39%
2274	3.2962E+17	3.53%	3.0016E+18	1.26%	6.6249E+18	0.82%	5.4087E+19	0.42%	5.1374E+18	1.25%	6.9180E+19	0.37%
2275	2.9382E+17	3.68%	2.8946E+18	1.26%	6.4619E+18	0.81%	5.3849E+19	0.42%	5.5538E+18	1.23%	6.9053E+19	0.37%
2276	6.1243E+17	3.45%	3.0768E+18	1.38%	6.3778E+18	0.91%	5.0052E+19	0.46%	4.3084E+18	1.47%	6.4427E+19	0.41%
2277	2.2314E+17	4.29%	1.9062E+18	1.54%	4.0436E+18	1.01%	3.6114E+19	0.50%	4.1805E+18	1.40%	4.6467E+19	0.45%
2278	2.1270E+17	4.15%	1.8644E+18	1.49%	4.0406E+18	0.98%	3.6352E+19	0.49%	4.4228E+18	1.35%	4.6892E+19	0.43%
2279	1.7522E+17	4.42%	1.8697E+18	1.51%	4.0042E+18	0.99%	3.6462E+19	0.48%	4.6142E+18	1.33%	4.7125E+19	0.43%
2280	2.9293E+17	4.20%	1.8597E+18	1.67%	3.9439E+18	1.09%	3.3908E+19	0.53%	3.7820E+18	1.56%	4.3787E+19	0.47%
2281	3.0942E+17	3.06%	2.2917E+18	1.15%	4.8132E+18	0.76%	4.1955E+19	0.40%	4.7024E+18	1.11%	5.4071E+19	0.36%
2282	2.6004E+17	3.06%	2.2225E+18	1.11%	4.7732E+18	0.73%	4.2245E+19	0.39%	5.0400E+18	1.06%	5.4541E+19	0.35%
2283	2.1539E+17	3.34%	2.1381E+18	1.14%	4.6721E+18	0.74%	4.2661E+19	0.39%	5.3459E+18	1.03%	5.5033E+19	0.35%
2284	3.8434E+17	2.79%	1.8853E+18	1.23%	3.8163E+18	0.81%	3.2461E+19	0.42%	3.4905E+18	1.25%	4.2038E+19	0.37%
2285	3.8294E+17	3.34%	2.4909E+18	1.35%	5.1961E+18	0.90%	4.5055E+19	0.45%	5.0327E+18	1.30%	5.8157E+19	0.40%
2286	3.0475E+17	3.47%	2.4051E+18	1.31%	5.1613E+18	0.86%	4.5479E+19	0.44%	5.1712E+18	1.22%	5.8521E+19	0.39%
2287	2.6519E+17	3.62%	2.3398E+18	1.32%	5.0445E+18	0.93%	4.5443E+19	0.43%	5.6115E+18	1.20%	5.8704E+19	0.39%
2288	5.6578E+17	3.00%	2.5205E+18	1.40%	4.9018E+18	0.96%	4.1481E+19	0.48%	4.2317E+18	1.41%	5.3700E+19	0.42%
2289	2.1734E+17	4.16%	1.5472E+18	1.62%	3.1987E+18	1.06%	3.0318E+19	0.52%	3.8606E+18	1.38%	3.9142E+19	0.47%
2290	1.8931E+17	4.20%	1.5314E+18	1.57%	3.1912E+18	1.05%	3.0704E+19	0.51%	4.2906E+18	1.33%	3.9907E+19	0.45%
2291	1.5583E+17	4.49%	1.5059E+18	1.60%	3.1946E+18	1.06%	3.0910E+19	0.51%	4.4090E+18	1.31%	4.0175E+19	0.45%
2292	2.6309E+17	3.63%	1.5977E+18	1.56%	3.1741E+18	1.05%	2.8844E+19	0.51%	3.5049E+18	1.43%	3.7384E+19	0.46%
2293	3.1308E+17	2.86%	1.8204E+18	1.20%	3.7470E+18	0.81%	3.4770E+19	0.42%	4.3752E+18	1.11%	4.5025E+19	0.38%
2294	2.2558E+17	3.18%	1.8195E+18	1.18%	3.7918E+18	0.78%	3.5867E+19	0.41%	4.8096E+18	1.03%	4.6513E+19	0.36%
2295	2.0128E+17	3.34%	1.7441E+18	1.20%	3.7027E+18	0.79%	3.6228E+19	0.40%	5.0670E+18	1.02%	4.6943E+19	0.36%
2296	4.3739E+17	2.26%	1.8443E+18	1.15%	3.5524E+18	0.79%	3.2199E+19	0.42%	3.8577E+18	1.17%	4.1891E+19	0.37%
2297	3.9768E+17	3.07%	2.0488E+18	1.41%	4.0856E+18	0.95%	3.7416E+19	0.47%	4.7476E+18	1.26%	4.8696E+19	0.42%
2298	2.8833E+17	3.34%	1.9966E+18	1.38%	4.1374E+18	0.92%	3.8377E+19	0.45%	5.1015E+18	1.18%	4.9901E+19	0.40%
2299	2.5474E+17	3.71%	1.9267E+18	1.38%	4.0453E+18	0.91%	3.8257E+19	0.45%	5.2076E+18	1.15%	4.9692E+19	0.40%
2300	5.5442E+17	2.35%	2.0383E+18	1.33%	3.7652E+18	0.94%	3.3894E+19	0.48%	4.0021E+18	1.32%	4.4254E+19	0.42%
2301	1.9314E+17	3.97%	1.2907E+18	1.68%	2.6000E+18	1.11%	2.5780E+19	0.54%	3.7352E+18	1.39%	3.3599E+19	0.48%
2302	1.6436E+17	4.22%	1.2730E+18	1.66%	2.5849E+18	1.12%	2.6187E+19	0.53%	4.0282E+18	1.34%	3.4238E+19	0.47%
2303	1.5325E+17	4.44%	1.2653E+18	1.67%	2.5519E+18	1.12%	2.6359E+19	0.54%	4.0422E+18	1.29%	3.4372E+19	0.48%
2304	2.3401E+17	3.57%	1.3205E+18	1.61%	2.5625E+18	1.12%	2.4745E+19	0.54%	3.4121E+18	1.39%	3.2274E+19	0.48%
2305	2.8150E+17	2.81%	1.5138E+18	1.22%	3.0300E+18	0.84%	2.9432E+19	0.43%	4.1098E+18	1.09%	3.8367E+19	0.38%
2306	1.9951E+17	3.34%	1.5284E+18	1.24%	3.0437E+18	0.84%	3.0481E+19	0.42%	4.4519E+18	1.02%	3.9705E+19	0.38%
2307	1.8799E+17	3.43%	1.4466E+18	1.27%	2.9886E+18	0.84%	3.0444E+19	0.43%	4.7152E+18	1.04%	3.9783E+19	0.38%
2308	3.6527E+17	2.29%	1.4961E+18	1.19%	2.8419E+18	0.84%	2.7708E+19	0.44%	3.7615E+18	1.12%	3.6173E+19	0.39%
2309	3.3921E+17	2.93%	1.6727E+18	1.43%	3.2356E+18	0.99%	3.1202E+19	0.49%	4.3303E+18	1.27%	4.0779E+19	0.43%
2310	2.6097E+17	3.43%	1.6832E+18	1.43%	3.3803E+18	0.96%	3.2634E+19	0.47%	4.6708E+18	1.21%	4.2630E+19	0.42%
2311	2.4844E+17	3.60%	1.6472E+18	1.45%	3.3044E+18	0.98%	3.2625E+19	0.48%	4.8250E+18	1.20%	4.2650E+19	0.42%

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
2312	4.6582E+17	± 2.38%	1.6369E+18	± 1.39%	3.0424E+18	± 1.00%	2.9203E+19	± 0.50%	3.9425E+18	± 1.33%	3.8290E+19 ± 0.44%
2321	5.6875E+16	± 1.03%	2.0357E+17	± 0.64%	3.1721E+17	± 0.45%	3.0098E+18	± 0.21%	5.6324E+17	± 0.31%	4.1507E+18 ± 0.19%
2331	5.3632E+16	± 1.42%	1.9320E+17	± 0.89%	3.0934E+17	± 0.62%	2.9966E+18	± 0.27%	5.7490E+17	± 0.40%	4.1277E+18 ± 0.26%
2341	5.9613E+16	± 1.34%	2.1095E+17	± 0.85%	3.2180E+17	± 0.60%	3.0548E+18	± 0.27%	5.7564E+17	± 0.40%	4.2228E+18 ± 0.25%
2351	5.6623E+16	± 1.03%	2.1122E+17	± 0.62%	3.2733E+17	± 0.44%	3.0954E+18	± 0.20%	5.8738E+17	± 0.29%	4.2780E+18 ± 0.19%
2361	6.2204E+16	± 1.00%	2.0684E+17	± 0.64%	3.1719E+17	± 0.45%	2.9860E+18	± 0.21%	5.5295E+17	± 0.30%	4.1251E+18 ± 0.19%
2371	1.3871E+16	± 1.60%	2.8146E+16	± 1.18%	3.5674E+16	± 0.81%	2.2462E+17	± 0.49%	3.9611E+16	± 0.75%	3.4192E+17 ± 0.46%
2381	1.2634E+16	± 1.68%	2.5570E+16	± 1.21%	3.1815E+16	± 0.86%	2.0074E+17	± 0.50%	3.5967E+16	± 0.76%	3.0673E+17 ± 0.47%
2391	1.2037E+16	± 1.69%	2.5004E+16	± 1.23%	3.2595E+16	± 0.88%	1.9979E+17	± 0.52%	3.5561E+16	± 0.78%	3.0499E+17 ± 0.48%
2401	1.5236E+16	± 1.54%	3.2774E+16	± 1.09%	4.0105E+16	± 0.74%	2.4988E+17	± 0.46%	4.2570E+16	± 0.71%	3.8057E+17 ± 0.43%
2501	5.7160E+17	± 3.31%	5.4714E+18	± 1.15%	1.2570E+19	± 0.73%	7.6272E+19	± 0.39%	3.8531E+18	± 1.59%	9.8738E+19 ± 0.35%
2502	4.7133E+17	± 3.59%	5.4775E+18	± 1.15%	1.2763E+19	± 0.73%	7.7032E+19	± 0.39%	3.9138E+18	± 1.61%	9.9658E+19 ± 0.35%
2503	4.4535E+17	± 3.51%	5.3793E+18	± 1.16%	1.2526E+19	± 0.73%	7.7359E+19	± 0.40%	4.2471E+18	± 1.57%	9.9956E+19 ± 0.35%
2504	7.5091E+17	± 2.72%	5.4199E+18	± 1.14%	1.2274E+19	± 0.73%	7.3258E+19	± 0.40%	3.2478E+18	± 1.67%	9.4951E+19 ± 0.35%
2505	5.8125E+17	± 2.82%	4.8535E+18	± 1.05%	1.0762E+19	± 0.68%	7.0548E+19	± 0.37%	3.9570E+18	± 1.39%	9.0702E+19 ± 0.33%
2506	5.0179E+17	± 2.91%	4.7022E+18	± 1.06%	1.0747E+19	± 0.68%	7.1099E+19	± 0.37%	4.1190E+18	± 1.43%	9.1169E+19 ± 0.33%
2507	4.5666E+17	± 2.97%	4.7091E+18	± 1.07%	1.0762E+19	± 0.69%	7.0627E+19	± 0.37%	4.2125E+18	± 1.34%	9.0768E+19 ± 0.32%
2508	7.7370E+17	± 2.35%	4.6898E+18	± 1.06%	1.0508E+19	± 0.68%	6.8102E+19	± 0.37%	3.4569E+18	± 1.48%	8.7530E+19 ± 0.33%
2509	5.7150E+17	± 2.67%	3.4768E+18	± 1.23%	7.0760E+18	± 0.84%	5.8403E+19	± 0.41%	4.3376E+18	± 1.38%	7.3866E+19 ± 0.36%
2510	5.4888E+17	± 2.71%	3.5759E+18	± 1.22%	7.0741E+18	± 0.82%	5.8914E+19	± 0.41%	4.2658E+18	± 1.37%	7.4379E+19 ± 0.36%
2511	5.0682E+17	± 2.73%	3.4747E+18	± 1.22%	7.1200E+18	± 0.83%	5.8791E+19	± 0.40%	4.4629E+18	± 1.34%	7.4355E+19 ± 0.36%
2512	6.7072E+17	± 2.51%	3.5031E+18	± 1.22%	7.0796E+18	± 0.83%	5.7353E+19	± 0.41%	3.9823E+18	± 1.40%	7.2588E+19 ± 0.36%
2513	5.8291E+17	± 3.06%	3.2986E+18	± 1.39%	6.6831E+18	± 0.94%	5.5843E+19	± 0.46%	4.3326E+18	± 1.53%	7.0740E+19 ± 0.41%
2514	5.3818E+17	± 3.08%	3.4181E+18	± 1.37%	6.7433E+18	± 0.93%	5.5845E+19	± 0.46%	4.3185E+18	± 1.55%	7.0863E+19 ± 0.40%
2515	5.5433E+17	± 3.09%	3.4519E+18	± 1.39%	6.6861E+18	± 0.94%	5.5781E+19	± 0.46%	4.3098E+18	± 1.53%	7.0784E+19 ± 0.40%
2516	5.9458E+17	± 2.98%	3.3216E+18	± 1.38%	6.6744E+18	± 0.94%	5.4921E+19	± 0.47%	4.1560E+18	± 1.56%	6.9668E+19 ± 0.42%
2517	5.9564E+17	± 2.68%	3.4387E+18	± 1.22%	6.9318E+18	± 0.83%	5.5528E+19	± 0.43%	4.1976E+18	± 1.43%	7.0692E+19 ± 0.38%
2518	5.3595E+17	± 2.75%	3.4136E+18	± 1.23%	6.9677E+18	± 0.83%	5.5669E+19	± 0.43%	4.2394E+18	± 1.44%	7.0826E+19 ± 0.38%
2519	5.5543E+17	± 2.77%	3.3760E+18	± 1.24%	6.8642E+18	± 0.83%	5.5822E+19	± 0.43%	4.2831E+18	± 1.47%	7.0901E+19 ± 0.38%
2520	5.6212E+17	± 2.82%	3.3679E+18	± 1.24%	6.8723E+18	± 0.84%	5.5102E+19	± 0.44%	4.2133E+18	± 1.47%	7.0118E+19 ± 0.38%
2521	5.7303E+17	± 2.36%	3.4024E+18	± 1.01%	6.9168E+18	± 0.67%	5.4003E+19	± 0.37%	4.0128E+18	± 1.27%	6.8908E+19 ± 0.33%
2522	5.1768E+17	± 2.41%	3.3716E+18	± 1.01%	6.8487E+18	± 0.67%	5.3978E+19	± 0.37%	3.9953E+18	± 1.23%	6.8711E+19 ± 0.33%
2523	5.1954E+17	± 2.41%	3.4238E+18	± 1.02%	6.9518E+18	± 0.67%	5.3965E+19	± 0.37%	3.9889E+18	± 1.27%	6.8849E+19 ± 0.33%
2524	5.3056E+17	± 2.38%	3.3506E+18	± 1.03%	6.9871E+18	± 0.67%	5.3726E+19	± 0.38%	3.9624E+18	± 1.26%	6.8557E+19 ± 0.33%
2525	5.0512E+17	± 2.88%	3.1576E+18	± 1.25%	6.3977E+18	± 0.85%	4.8877E+19	± 0.46%	3.5262E+18	± 1.58%	6.2464E+19 ± 0.40%
2526	5.2385E+17	± 2.88%	3.1800E+18	± 1.27%	6.3481E+18	± 0.84%	4.9092E+19	± 0.46%	3.5978E+18	± 1.55%	6.2741E+19 ± 0.40%
2527	4.9031E+17	± 2.90%	3.0444E+18	± 1.26%	6.4762E+18	± 0.84%	4.8829E+19	± 0.45%	3.5637E+18	± 1.57%	6.2404E+19 ± 0.40%
2528	4.6994E+17	± 3.01%	3.0796E+18	± 1.27%	6.3862E+18	± 0.84%	4.8694E+19	± 0.46%	3.6039E+18	± 1.56%	6.2233E+19 ± 0.40%
2529	4.8557E+17	± 3.56%	3.8938E+18	± 1.30%	8.4989E+18	± 0.85%	6.2203E+19	± 0.44%	4.7905E+18	± 1.54%	7.9872E+19 ± 0.39%
2530	4.0457E+17	± 3.83%	3.8608E+18	± 1.31%	8.7812E+18	± 0.84%	6.4089E+19	± 0.44%	4.9825E+18	± 1.45%	8.2118E+19 ± 0.38%
2531	3.7201E+17	± 3.63%	3.8511E+18	± 1.28%	8.5318E+18	± 0.83%	6.3835E+19	± 0.43%	5.3169E+18	± 1.39%	8.1906E+19 ± 0.38%
2532	7.0848E+17	± 3.09%	3.9454E+18	± 1.31%	8.4017E+18	± 0.86%	5.9891E+19	± 0.45%	4.1152E+18	± 1.66%	7.7062E+19 ± 0.39%
2533	5.1981E+17	± 3.03%	3.4744E+18	± 1.19%	7.4947E+18	± 0.77%	5.8292E+19	± 0.40%	4.9571E+18	± 1.33%	7.4738E+19 ± 0.36%
2534	4.4989E+17	± 3.15%	3.4641E+18	± 1.18%	7.6035E+18	± 0.78%	5.9068E+19	± 0.40%	4.9527E+18	± 1.28%	7.5539E+19 ± 0.36%

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
2535	3.6966E+17	± 3.14%	3.3753E+18	± 1.16%	7.4685E+18	± 0.76%	5.9020E+19	± 0.40%	5.3215E+18	± 1.27%	7.5554E+19 ± 0.35%
2536	7.5829E+17	± 2.68%	3.6081E+18	± 1.20%	7.4550E+18	± 0.80%	5.7045E+19	± 0.41%	4.2224E+18	± 1.44%	7.3088E+19 ± 0.37%
2537	5.0597E+17	± 2.90%	2.8287E+18	± 1.32%	5.4553E+18	± 0.89%	5.0644E+19	± 0.43%	5.2814E+18	± 1.29%	6.4716E+19 ± 0.39%
2538	4.3861E+17	± 2.96%	2.9057E+18	± 1.30%	5.8295E+18	± 0.89%	5.1791E+19	± 0.43%	5.2220E+18	± 1.29%	6.6186E+19 ± 0.39%
2539	4.0945E+17	± 2.84%	2.7673E+18	± 1.28%	5.7260E+18	± 0.89%	5.1162E+19	± 0.42%	5.3434E+18	± 1.27%	6.5408E+19 ± 0.38%
2540	5.7897E+17	± 2.76%	2.8532E+18	± 1.33%	5.6266E+18	± 0.90%	4.9538E+19	± 0.44%	4.7314E+18	± 1.36%	6.3329E+19 ± 0.39%
2541	4.6429E+17	± 3.29%	2.5576E+18	± 1.53%	5.1407E+18	± 1.06%	4.7812E+19	± 0.49%	5.1530E+18	± 1.44%	6.1128E+19 ± 0.44%
2542	4.2553E+17	± 3.25%	2.6816E+18	± 1.52%	5.3020E+18	± 1.04%	4.8622E+19	± 0.49%	5.2753E+18	± 1.43%	6.2307E+19 ± 0.44%
2543	4.0274E+17	± 3.38%	2.6958E+18	± 1.51%	5.2647E+18	± 1.05%	4.8168E+19	± 0.49%	5.2042E+18	± 1.42%	6.1735E+19 ± 0.44%
2544	4.8737E+17	± 3.33%	2.5523E+18	± 1.53%	5.0685E+18	± 1.04%	4.7497E+19	± 0.50%	4.9312E+18	± 1.45%	6.0536E+19 ± 0.44%
2545	4.4760E+17	± 2.95%	2.6160E+18	± 1.36%	5.2883E+18	± 0.93%	4.6648E+19	± 0.46%	4.9711E+18	± 1.35%	5.9972E+19 ± 0.41%
2546	4.2338E+17	± 3.07%	2.6224E+18	± 1.34%	5.2757E+18	± 0.92%	4.7494E+19	± 0.46%	5.1439E+18	± 1.36%	6.0959E+19 ± 0.41%
2547	4.2690E+17	± 3.02%	2.5725E+18	± 1.36%	5.2361E+18	± 0.93%	4.7438E+19	± 0.46%	5.1551E+18	± 1.34%	6.0829E+19 ± 0.41%
2548	4.2107E+17	± 3.08%	2.5298E+18	± 1.37%	5.1797E+18	± 0.93%	4.6334E+19	± 0.46%	4.9350E+18	± 1.32%	5.9399E+19 ± 0.41%
2549	4.1689E+17	± 2.47%	2.5362E+18	± 1.11%	5.1202E+18	± 0.74%	4.5337E+19	± 0.40%	4.6956E+18	± 1.17%	5.8106E+19 ± 0.36%
2550	3.9678E+17	± 2.60%	2.5249E+18	± 1.11%	5.0796E+18	± 0.75%	4.5365E+19	± 0.41%	4.9704E+18	± 1.17%	5.8337E+19 ± 0.36%
2551	3.9568E+17	± 2.58%	2.5413E+18	± 1.12%	5.1385E+18	± 0.75%	4.5274E+19	± 0.41%	4.8471E+18	± 1.21%	5.8197E+19 ± 0.36%
2552	3.8660E+17	± 2.65%	2.4756E+18	± 1.13%	5.1732E+18	± 0.76%	4.5004E+19	± 0.41%	4.6862E+18	± 1.17%	5.7726E+19 ± 0.36%
2553	3.4165E+17	± 3.38%	2.3441E+18	± 1.37%	4.6935E+18	± 0.95%	4.0493E+19	± 0.50%	4.2786E+18	± 1.49%	5.2151E+19 ± 0.44%
2554	3.8051E+17	± 3.15%	2.3404E+18	± 1.38%	4.6908E+18	± 0.96%	4.0865E+19	± 0.50%	4.3044E+18	± 1.46%	5.2581E+19 ± 0.44%
2555	3.5611E+17	± 3.23%	2.2635E+18	± 1.39%	4.7293E+18	± 0.94%	4.0841E+19	± 0.49%	4.3083E+18	± 1.49%	5.2498E+19 ± 0.44%
2556	3.5636E+17	± 3.28%	2.2933E+18	± 1.39%	4.7026E+18	± 0.96%	4.0438E+19	± 0.49%	4.1846E+18	± 1.47%	5.1975E+19 ± 0.44%
2557	4.2788E+17	± 3.70%	3.0966E+18	± 1.43%	6.4943E+18	± 0.93%	5.3165E+19	± 0.46%	5.2214E+18	± 1.45%	6.8406E+19 ± 0.41%
2558	3.6417E+17	± 3.69%	3.0248E+18	± 1.40%	6.5990E+18	± 0.91%	5.3658E+19	± 0.45%	5.2371E+18	± 1.36%	6.8883E+19 ± 0.40%
2559	3.4193E+17	± 3.66%	3.0607E+18	± 1.37%	6.4887E+18	± 0.90%	5.3745E+19	± 0.44%	5.7614E+18	± 1.37%	6.9398E+19 ± 0.40%
2560	6.7440E+17	± 3.50%	3.1245E+18	± 1.54%	6.3657E+18	± 1.01%	5.0166E+19	± 0.50%	4.5314E+18	± 1.61%	6.4862E+19 ± 0.44%
2561	4.4210E+17	± 3.16%	2.7934E+18	± 1.28%	5.7806E+18	± 0.85%	4.9642E+19	± 0.43%	5.2083E+18	± 1.23%	6.3867E+19 ± 0.38%
2562	3.9458E+17	± 3.04%	2.8148E+18	± 1.23%	5.8553E+18	± 0.82%	5.0136E+19	± 0.42%	5.1293E+18	± 1.23%	6.4330E+19 ± 0.37%
2563	3.4933E+17	± 3.19%	2.7154E+18	± 1.23%	5.7596E+18	± 0.81%	5.0145E+19	± 0.41%	5.4581E+18	± 1.21%	6.4427E+19 ± 0.37%
2564	6.5921E+17	± 3.12%	2.8782E+18	± 1.39%	5.7282E+18	± 0.92%	4.8045E+19	± 0.45%	4.5984E+18	± 1.42%	6.1909E+19 ± 0.40%
2565	4.4628E+17	± 2.95%	2.3181E+18	± 1.35%	4.4716E+18	± 0.93%	4.3543E+19	± 0.45%	5.3295E+18	± 1.24%	5.6109E+19 ± 0.40%
2566	3.9661E+17	± 2.95%	2.4168E+18	± 1.34%	4.8521E+18	± 0.92%	4.4769E+19	± 0.44%	5.1448E+18	± 1.23%	5.7579E+19 ± 0.39%
2567	3.6760E+17	± 2.93%	2.3438E+18	± 1.30%	4.7687E+18	± 0.92%	4.4357E+19	± 0.44%	5.4593E+18	± 1.22%	5.7296E+19 ± 0.39%
2568	5.6106E+17	± 2.83%	2.4074E+18	± 1.37%	4.6155E+18	± 0.96%	4.2693E+19	± 0.46%	4.7837E+18	± 1.29%	5.5061E+19 ± 0.41%
2569	3.8082E+17	± 3.38%	2.1796E+18	± 1.59%	4.2047E+18	± 1.10%	4.1374E+19	± 0.51%	5.2819E+18	± 1.41%	5.3421E+19 ± 0.45%
2570	3.8845E+17	± 3.42%	2.2644E+18	± 1.57%	4.3799E+18	± 1.09%	4.2048E+19	± 0.51%	5.2323E+18	± 1.36%	5.4313E+19 ± 0.45%
2571	3.5214E+17	± 3.51%	2.1954E+18	± 1.55%	4.2442E+18	± 1.09%	4.1577E+19	± 0.50%	5.2335E+18	± 1.37%	5.3602E+19 ± 0.45%
2572	4.2490E+17	± 3.39%	2.0995E+18	± 1.60%	4.1586E+18	± 1.11%	4.0647E+19	± 0.51%	5.0111E+18	± 1.37%	5.2341E+19 ± 0.45%
2573	3.7706E+17	± 3.17%	2.1406E+18	± 1.43%	4.2938E+18	± 0.99%	4.0353E+19	± 0.47%	5.0148E+18	± 1.30%	5.2179E+19 ± 0.42%
2574	3.6133E+17	± 3.06%	2.1484E+18	± 1.41%	4.2468E+18	± 0.98%	4.0826E+19	± 0.48%	5.2024E+18	± 1.26%	5.2785E+19 ± 0.43%
2575	3.5142E+17	± 3.17%	2.1136E+18	± 1.42%	4.2544E+18	± 0.98%	4.0720E+19	± 0.48%	5.3346E+18	± 1.27%	5.2774E+19 ± 0.42%
2576	3.5661E+17	± 3.28%	2.0950E+18	± 1.45%	4.1859E+18	± 0.99%	3.9669E+19	± 0.47%	4.9954E+18	± 1.27%	5.1302E+19 ± 0.42%
2577	3.7345E+17	± 2.55%	2.0595E+18	± 1.17%	4.0894E+18	± 0.81%	3.8544E+19	± 0.42%	4.8231E+18	± 1.11%	4.9889E+19 ± 0.37%
2578	3.4083E+17	± 2.75%	2.0607E+18	± 1.17%	4.0180E+18	± 0.80%	3.8561E+19	± 0.42%	5.0092E+18	± 1.11%	4.9990E+19 ± 0.37%

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)					Group 2 (2.225 - 6.0 MeV)					Group 3 (1.0 - 2.225 MeV)					Group 4 (50 keV - 1.0 MeV)					Group 5 (Below 50 keV)					Total
	3.323E+17	2.59E+17	2.018E+18	1.20E+18	4.067E+18	0.80E+18	3.840E+19	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18				
2579	3.323E+17	2.59E+17	2.018E+18	1.20E+18	4.067E+18	0.80E+18	3.840E+19	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18	4.924E+18	0.42E+19	4.924E+18	1.12E+18				
2580	3.259E+17	2.79E+17	1.988E+18	1.20E+18	4.106E+18	0.82E+18	3.794E+19	0.51E+19	4.791E+18	1.13E+18	4.791E+18	0.51E+19	4.791E+18	1.13E+18	4.791E+18	0.51E+19	4.791E+18	1.13E+18	4.791E+18	0.51E+19	4.791E+18	1.13E+18				
2581	2.802E+17	3.53E+17	1.863E+18	1.47E+18	3.683E+18	1.02E+18	3.404E+19	0.42E+19	4.390E+18	1.43E+18	4.390E+18	0.42E+19	4.390E+18	1.43E+18	4.390E+18	0.42E+19	4.390E+18	1.43E+18	4.390E+18	0.42E+19	4.390E+18	1.43E+18				
2582	3.147E+17	3.26E+17	1.855E+18	1.49E+18	3.699E+18	1.03E+18	3.441E+19	0.51E+19	4.428E+18	1.41E+18	4.428E+18	0.51E+19	4.428E+18	1.41E+18	4.428E+18	0.51E+19	4.428E+18	1.41E+18	4.428E+18	0.51E+19	4.428E+18	1.41E+18				
2583	3.029E+17	3.34E+17	1.845E+18	1.49E+18	3.711E+18	1.02E+18	3.438E+19	0.51E+19	4.331E+18	1.40E+18	4.331E+18	0.51E+19	4.331E+18	1.40E+18	4.331E+18	0.51E+19	4.331E+18	1.40E+18	4.331E+18	0.51E+19	4.331E+18	1.40E+18				
2584	3.052E+17	3.35E+17	1.823E+18	1.49E+18	3.696E+18	1.03E+18	3.418E+19	0.51E+19	4.248E+18	1.38E+18	4.248E+18	0.51E+19	4.248E+18	1.38E+18	4.248E+18	0.51E+19	4.248E+18	1.38E+18	4.248E+18	0.51E+19	4.248E+18	1.38E+18				
2585	4.257E+17	3.48E+17	2.532E+18	1.48E+18	5.023E+18	1.00E+18	4.423E+19	0.48E+19	4.952E+18	1.39E+18	4.952E+18	0.48E+19	4.952E+18	1.39E+18	4.952E+18	0.48E+19	4.952E+18	1.39E+18	4.952E+18	0.48E+19	4.952E+18	1.39E+18				
2586	3.270E+17	3.58E+17	2.422E+18	1.42E+18	5.139E+18	0.96E+18	4.508E+19	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18				
2587	3.102E+17	3.60E+17	2.470E+18	1.45E+18	5.081E+18	0.96E+18	4.508E+19	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18	5.148E+18	0.46E+19	5.148E+18	1.35E+18				
2588	6.175E+17	3.19E+17	2.511E+18	1.59E+18	4.978E+18	0.90E+18	4.163E+19	0.51E+19	4.456E+18	1.56E+18	4.456E+18	0.51E+19	4.456E+18	1.56E+18	4.456E+18	0.51E+19	4.456E+18	1.56E+18	4.456E+18	0.51E+19	4.456E+18	1.56E+18				
2589	4.342E+17	2.97E+17	2.313E+18	1.32E+18	4.575E+18	0.90E+18	4.198E+19	0.44E+19	4.933E+18	1.21E+18	4.933E+18	0.44E+19	4.933E+18	1.21E+18	4.933E+18	0.44E+19	4.933E+18	1.21E+18	4.933E+18	0.44E+19	4.933E+18	1.21E+18				
2590	3.827E+17	2.89E+17	2.362E+18	1.25E+18	4.653E+18	0.84E+18	4.239E+19	0.43E+19	4.936E+18	1.20E+18	4.936E+18	0.43E+19	4.936E+18	1.20E+18	4.936E+18	0.43E+19	4.936E+18	1.20E+18	4.936E+18	0.43E+19	4.936E+18	1.20E+18				
2591	3.392E+17	2.99E+17	2.293E+18	1.26E+18	4.627E+18	0.86E+18	4.299E+19	0.43E+19	5.262E+18	1.17E+18	5.262E+18	0.43E+19	5.262E+18	1.17E+18	5.262E+18	0.43E+19	5.262E+18	1.17E+18	5.262E+18	0.43E+19	5.262E+18	1.17E+18				
2592	6.250E+17	2.77E+17	2.370E+18	1.41E+18	4.525E+18	0.97E+18	4.023E+19	0.47E+19	4.544E+18	1.38E+18	4.544E+18	0.47E+19	4.544E+18	1.38E+18	4.544E+18	0.47E+19	4.544E+18	1.38E+18	4.544E+18	0.47E+19	4.544E+18	1.38E+18				
2593	4.156E+17	2.91E+17	1.961E+18	1.39E+18	3.776E+18	0.96E+18	3.742E+19	0.46E+19	4.902E+18	1.20E+18	4.902E+18	0.46E+19	4.902E+18	1.20E+18	4.902E+18	0.46E+19	4.902E+18	1.20E+18	4.902E+18	0.46E+19	4.902E+18	1.20E+18				
2594	3.707E+17	2.86E+17	2.113E+18	1.33E+18	4.031E+18	0.92E+18	3.831E+19	0.45E+19	4.870E+18	1.24E+18	4.870E+18	0.45E+19	4.870E+18	1.24E+18	4.870E+18	0.45E+19	4.870E+18	1.24E+18	4.870E+18	0.45E+19	4.870E+18	1.24E+18				
2595	3.505E+17	2.96E+17	2.012E+18	1.34E+18	3.977E+18	0.93E+18	3.852E+19	0.45E+19	5.095E+18	1.17E+18	5.095E+18	0.45E+19	5.095E+18	1.17E+18	5.095E+18	0.45E+19	5.095E+18	1.17E+18	5.095E+18	0.45E+19	5.095E+18	1.17E+18				
2596	5.252E+17	2.71E+17	2.040E+18	1.41E+18	3.798E+18	0.99E+18	3.655E+19	0.48E+19	4.684E+18	1.25E+18	4.684E+18	0.48E+19	4.684E+18	1.25E+18	4.684E+18	0.48E+19	4.684E+18	1.25E+18	4.684E+18	0.48E+19	4.684E+18	1.25E+18				
2597	3.743E+17	3.37E+17	1.894E+18	1.63E+18	3.563E+18	1.15E+18	3.520E+19	0.53E+19	4.931E+18	1.40E+18	4.931E+18	0.53E+19	4.931E+18	1.40E+18	4.931E+18	0.53E+19	4.931E+18	1.40E+18	4.931E+18	0.53E+19	4.931E+18	1.40E+18				
2598	3.488E+17	3.34E+17	1.899E+18	1.62E+18	3.657E+18	1.13E+18	3.574E+19	0.52E+19	5.066E+18	1.37E+18	5.066E+18	0.52E+19	5.066E+18	1.37E+18	5.066E+18	0.52E+19	5.066E+18	1.37E+18	5.066E+18	0.52E+19	5.066E+18	1.37E+18				
2599	3.348E+17	3.42E+17	1.891E+18	1.67E+18	3.590E+18	1.14E+18	3.609E+19	0.52E+19	5.134E+18	1.36E+18	5.134E+18	0.52E+19	5.134E+18	1.36E+18	5.134E+18	0.52E+19	5.134E+18	1.36E+18	5.134E+18	0.52E+19	5.134E+18	1.36E+18				
2600	3.584E+17	3.50E+17	1.793E+18	1.48E+18	3.428E+18	1.17E+18	3.476E+19	0.53E+19	4.906E+18	1.30E+18	4.906E+18	0.53E+19	4.906E+18	1.30E+18	4.906E+18	0.53E+19	4.906E+18	1.30E+18	4.906E+18	0.53E+19	4.906E+18	1.30E+18				
2601	3.295E+17	3.22E+17	1.820E+18	1.48E+18	3.526E+18	1.03E+18	3.453E+19	0.50E+19	4.875E+18	1.30E+18	4.875E+18	0.50E+19	4.875E+18	1.30E+18	4.875E+18	0.50E+19	4.875E+18	1.30E+18	4.875E+18	0.50E+19	4.875E+18	1.30E+18				
2602	3.251E+17	3.19E+17	1.819E+18	1.48E+18	3.482E+18	1.03E+18	3.503E+19	0.49E+19	5.022E+18	1.26E+18	5.022E+18	0.49E+19	5.022E+18	1.26E+18	5.022E+18	0.49E+19	5.022E+18	1.26E+18	5.022E+18	0.49E+19	5.022E+18	1.26E+18				
2603	3.224E+17	3.13E+17	1.763E+18	1.49E+18	3.538E+18	1.03E+18	3.486E+19	0.49E+19	5.112E+18	1.25E+18	5.112E+18	0.49E+19	5.112E+18	1.25E+18	5.112E+18	0.49E+19	5.112E+18	1.25E+18	5.112E+18	0.49E+19	5.112E+18	1.25E+18				
2604	3.187E+17	3.27E+17	1.694E+18	1.51E+18	3.369E+18	1.05E+18	3.365E+19	0.49E+19	4.808E+18	1.25E+18	4.808E+18	0.49E+19	4.808E+18	1.25E+18	4.808E+18	0.49E+19	4.808E+18	1.25E+18	4.808E+18	0.49E+19	4.808E+18	1.25E+18				
2605	3.281E+17	3.26E+17	1.721E+18	1.23E+18	3.309E+18	0.86E+18	3.261E+19	0.43E+19	4.540E+18	1.10E+18	4.540E+18	0.43E+19	4.540E+18	1.10E+18	4.540E+18	0.43E+19	4.540E+18	1.10E+18	4.540E+18	0.43E+19	4.540E+18	1.10E+18				
2606	2.849E+17	2.79E+17	1.622E+18	1.26E+18	3.270E+18	0.85E+18	3.262E+19	0.44E+19	4.725E+18	1.09E+18	4.725E+18	0.44E+19	4.725E+18	1.09E+18	4.725E+18	0.44E+19	4.725E+18	1.09E+18	4.725E+18	0.44E+19	4.725E+18	1.09E+18				
2607	2.878E+17	2.78E+17	1.671E+18	1.26E+18	3.277E+18	0.86E+18	3.282E+19	0.44E+19	4.611E+18	1.10E+18	4.611E+18	0.44E+19	4.611E+18	1.10E+18	4.611E+18	0.44E+19	4.611E+18	1.10E+18	4.611E+18	0.44E+19	4.611E+18	1.10E+18				
2608	2.805E+17	2.89E+17	1.540E+18	1.55E+18	2.979E+18	1.08E+18	2.881E+19	0.54E+19	4.098E+18	1.39E+18	4.098E+18	0.54E+19	4.098E+18	1.39E+18	4.098E+18	0.54E+19	4.098E+18	1.39E+18	4.098E+18	0.54E+19	4.098E+18	1.39E+18				
2609	2.451E+17	3.63E+17	1.519E+18	1.57E+18	2.937E+18	1.10E+18	2.912E+19	0.54E+19	4.146E+18	1.37E+18																

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
2623	3.5725E+17	± 2.92%	1.7948E+18	± 1.35%	3.4192E+18	± 0.94%	3.3233E+19	± 0.47%	4.5057E+18	± 1.21%	4.3310E+19 ± 0.42%
2624	4.7467E+17	± 2.49%	1.6888E+18	± 1.41%	3.0973E+18	± 1.00%	3.1039E+19	± 0.48%	4.4127E+18	± 1.23%	4.0713E+19 ± 0.43%
2625	3.4214E+17	± 3.72%	1.6003E+18	± 1.74%	2.9862E+18	± 1.23%	3.0472E+19	± 0.55%	4.6397E+18	± 1.39%	4.0041E+19 ± 0.49%
2626	3.3426E+17	± 3.32%	1.6646E+18	± 1.65%	3.1894E+18	± 1.15%	3.0962E+19	± 0.54%	4.7556E+18	± 1.39%	4.0906E+19 ± 0.48%
2627	3.2773E+17	± 3.43%	1.6605E+18	± 1.64%	3.0543E+18	± 1.16%	3.1145E+19	± 0.54%	4.6768E+18	± 1.36%	4.0864E+19 ± 0.48%
2628	3.0970E+17	± 3.46%	1.5399E+18	± 1.73%	2.9212E+18	± 1.23%	3.0053E+19	± 0.55%	4.7008E+18	± 1.34%	3.9524E+19 ± 0.49%
2629	3.0938E+17	± 3.44%	1.5824E+18	± 1.59%	2.9141E+18	± 1.11%	2.9503E+19	± 0.52%	4.4969E+18	± 1.27%	3.8806E+19 ± 0.46%
2630	2.9348E+17	± 3.16%	1.5442E+18	± 1.54%	2.9365E+18	± 1.07%	3.0194E+19	± 0.51%	4.6792E+18	± 1.28%	3.9647E+19 ± 0.46%
2631	2.9804E+17	± 3.22%	1.5115E+18	± 1.54%	2.9496E+18	± 1.08%	2.9861E+19	± 0.51%	4.7163E+18	± 1.25%	3.9336E+19 ± 0.45%
2632	2.8388E+17	± 3.29%	1.4276E+18	± 1.59%	2.7590E+18	± 1.11%	2.9129E+19	± 0.51%	4.4865E+18	± 1.22%	3.8086E+19 ± 0.46%
2633	2.9348E+17	± 2.88%	1.4218E+18	± 1.33%	2.6793E+18	± 0.93%	2.7291E+19	± 0.47%	4.0965E+18	± 1.10%	3.5782E+19 ± 0.41%
2634	2.5734E+17	± 2.94%	1.4485E+18	± 1.29%	2.6823E+18	± 0.91%	2.8146E+19	± 0.46%	4.4584E+18	± 1.07%	3.6992E+19 ± 0.41%
2635	2.4734E+17	± 2.85%	1.3832E+18	± 1.31%	2.7115E+18	± 0.91%	2.7809E+19	± 0.46%	4.4133E+18	± 1.09%	3.6564E+19 ± 0.41%
2636	2.4471E+17	± 2.92%	1.3671E+18	± 1.32%	2.6511E+18	± 0.91%	2.7294E+19	± 0.46%	4.3675E+18	± 1.09%	3.5924E+19 ± 0.41%
2637	2.1747E+17	± 3.75%	1.2530E+18	± 1.66%	2.4335E+18	± 1.16%	2.4276E+19	± 0.57%	3.7545E+18	± 1.40%	3.1934E+19 ± 0.51%
2638	2.3699E+17	± 3.59%	1.2595E+18	± 1.65%	2.3710E+18	± 1.17%	2.4764E+19	± 0.57%	3.9182E+18	± 1.34%	3.2549E+19 ± 0.50%
2639	2.2381E+17	± 3.54%	1.2369E+18	± 1.67%	2.3901E+18	± 1.16%	2.4645E+19	± 0.56%	3.8706E+18	± 1.36%	3.2367E+19 ± 0.50%
2640	2.3351E+17	± 3.47%	1.2327E+18	± 1.68%	2.3809E+18	± 1.18%	2.4764E+19	± 0.57%	3.8445E+18	± 1.37%	3.2456E+19 ± 0.51%
2641	3.5971E+17	± 3.16%	1.7439E+18	± 1.59%	3.2614E+18	± 1.11%	3.1241E+19	± 0.52%	4.4239E+18	± 1.39%	4.1029E+19 ± 0.46%
2642	3.2295E+17	± 3.38%	1.7659E+18	± 1.55%	3.4480E+18	± 1.05%	3.2426E+19	± 0.52%	4.4122E+18	± 1.32%	4.2375E+19 ± 0.45%
2643	2.9183E+17	± 3.60%	1.7371E+18	± 1.55%	3.3454E+18	± 1.05%	3.2625E+19	± 0.51%	4.4350E+18	± 1.32%	4.2434E+19 ± 0.45%
2644	4.8985E+17	± 2.56%	1.7013E+18	± 1.54%	3.0331E+18	± 1.12%	2.9177E+19	± 0.54%	3.9292E+18	± 1.38%	3.8330E+19 ± 0.47%
2645	3.7900E+17	± 2.78%	1.6449E+18	± 1.39%	2.9907E+18	± 0.98%	2.9669E+19	± 0.48%	4.2511E+18	± 1.24%	3.8934E+19 ± 0.43%
2646	4.0258E+17	± 2.77%	1.8814E+18	± 1.29%	3.3993E+18	± 0.90%	3.0625E+19	± 0.47%	3.7207E+18	± 1.29%	4.0029E+19 ± 0.42%
2647	3.7853E+17	± 2.82%	1.8588E+18	± 1.32%	3.3565E+18	± 0.90%	3.0815E+19	± 0.47%	3.9162E+18	± 1.31%	4.0325E+19 ± 0.42%
2648	5.0607E+17	± 2.21%	1.6237E+18	± 1.37%	2.8594E+18	± 0.99%	2.8059E+19	± 0.49%	3.9158E+18	± 1.26%	3.6964E+19 ± 0.43%
2649	3.4785E+17	± 2.76%	1.4995E+18	± 1.48%	2.7022E+18	± 1.04%	2.7640E+19	± 0.50%	4.2331E+18	± 1.21%	3.6423E+19 ± 0.44%
2650	3.9631E+17	± 2.80%	1.7802E+18	± 1.36%	3.1113E+18	± 0.94%	2.8068E+19	± 0.50%	3.6075E+18	± 1.34%	3.6964E+19 ± 0.44%
2651	3.8529E+17	± 2.80%	1.7046E+18	± 1.37%	3.0061E+18	± 0.95%	2.8000E+19	± 0.50%	3.6228E+18	± 1.29%	3.6718E+19 ± 0.43%
2652	4.0114E+17	± 2.55%	1.4115E+18	± 1.45%	2.5647E+18	± 1.05%	2.6646E+19	± 0.50%	4.1604E+18	± 1.23%	3.5183E+19 ± 0.44%
2653	3.1057E+17	± 3.39%	1.3918E+18	± 1.77%	2.5473E+18	± 1.25%	2.6340E+19	± 0.57%	4.1541E+18	± 1.40%	3.4744E+19 ± 0.50%
2654	3.3946E+17	± 3.27%	1.4882E+18	± 1.67%	2.7611E+18	± 1.18%	2.6810E+19	± 0.56%	4.0442E+18	± 1.39%	3.5442E+19 ± 0.50%
2655	3.1351E+17	± 3.43%	1.4751E+18	± 1.66%	2.6463E+18	± 1.18%	2.6693E+19	± 0.57%	4.1074E+18	± 1.37%	3.5236E+19 ± 0.50%
2656	2.9821E+17	± 3.40%	1.3300E+18	± 1.77%	2.4299E+18	± 1.28%	2.5688E+19	± 0.58%	4.3254E+18	± 1.36%	3.4071E+19 ± 0.51%
2657	2.8551E+17	± 3.18%	1.3614E+18	± 1.60%	2.3969E+18	± 1.14%	2.5071E+19	± 0.54%	4.0764E+18	± 1.30%	3.3191E+19 ± 0.48%
2658	2.9614E+17	± 3.22%	1.3420E+18	± 1.58%	2.4847E+18	± 1.11%	2.5922E+19	± 0.54%	4.2587E+18	± 1.26%	3.4304E+19 ± 0.47%
2659	2.6055E+17	± 3.30%	1.3336E+18	± 1.62%	2.4602E+18	± 1.11%	2.5499E+19	± 0.53%	4.2711E+18	± 1.27%	3.3825E+19 ± 0.47%
2660	2.5595E+17	± 3.37%	1.2043E+18	± 1.66%	2.3255E+18	± 1.17%	2.4906E+19	± 0.54%	4.2377E+18	± 1.29%	3.2930E+19 ± 0.48%
2661	2.7474E+17	± 2.81%	1.2263E+18	± 1.36%	2.2385E+18	± 0.95%	2.3283E+19	± 0.49%	3.7630E+18	± 1.15%	3.0786E+19 ± 0.43%
2662	2.2771E+17	± 2.99%	1.2257E+18	± 1.36%	2.2182E+18	± 0.94%	2.3650E+19	± 0.48%	4.0824E+18	± 1.09%	3.1404E+19 ± 0.43%
2663	2.2456E+17	± 2.89%	1.1653E+18	± 1.37%	2.2518E+18	± 0.96%	2.3591E+19	± 0.48%	4.0539E+18	± 1.09%	3.1287E+19 ± 0.43%
2664	2.1891E+17	± 2.95%	1.1456E+18	± 1.38%	2.1734E+18	± 0.97%	2.3138E+19	± 0.48%	3.9878E+18	± 1.11%	3.0664E+19 ± 0.43%
2665	2.0118E+17	± 3.82%	1.0702E+18	± 1.74%	1.9937E+18	± 1.24%	2.0420E+19	± 0.60%	3.3641E+18	± 1.40%	2.7049E+19 ± 0.53%
2666	2.1019E+17	± 3.65%	1.0634E+18	± 1.75%	1.9432E+18	± 1.25%	2.0867E+19	± 0.59%	3.6030E+18	± 1.38%	2.7686E+19 ± 0.52%

Table E-182. (Continued)

Cell Number	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
2667	2.1062E+17	± 3.69%	1.0201E+18	± 1.78%	1.9731E+18	± 1.24%	2.0758E+19	± 0.59%	3.5301E+18	± 1.39%	2.7492E+19 ± 0.52%
2668	2.0085E+17	± 3.77%	1.0396E+18	± 1.76%	1.9059E+18	± 1.26%	2.0690E+19	± 0.59%	3.4384E+18	± 1.37%	2.7274E+19 ± 0.52%
2671	1.6208E+17	± 1.04%	5.4409E+17	± 0.66%	8.3372E+17	± 0.48%	7.8210E+18	± 0.23%	1.3652E+18	± 0.39%	1.0726E+19 ± 0.21%
2681	2.1451E+17	± 0.75%	6.3686E+17	± 0.50%	8.8013E+17	± 0.36%	6.5145E+18	± 0.20%	9.0710E+17	± 0.38%	9.1531E+18 ± 0.18%
2691	1.9976E+17	± 0.80%	6.1819E+17	± 0.52%	8.6943E+17	± 0.39%	6.7789E+18	± 0.21%	9.8021E+17	± 0.39%	9.4465E+18 ± 0.19%
2701	1.5491E+17	± 1.05%	4.9017E+17	± 0.69%	7.5832E+17	± 0.51%	7.3127E+18	± 0.23%	1.3024E+18	± 0.39%	1.0019E+19 ± 0.21%
2711	3.2249E+16	± 1.47%	7.0096E+16	± 1.02%	8.6033E+16	± 0.69%	5.1356E+17	± 0.45%	8.1798E+16	± 0.76%	7.8374E+17 ± 0.41%
2721	3.4968E+16	± 1.21%	8.0130E+16	± 0.83%	9.4681E+16	± 0.55%	5.3264E+17	± 0.38%	8.0565E+16	± 0.64%	8.2298E+17 ± 0.35%
2731	3.0968E+16	± 1.40%	7.0608E+16	± 0.97%	8.4933E+16	± 0.66%	4.7533E+17	± 0.44%	7.2131E+16	± 0.76%	7.3396E+17 ± 0.40%
2741	3.1754E+16	± 1.46%	7.1004E+16	± 1.04%	8.5961E+16	± 0.69%	5.1480E+17	± 0.45%	8.0079E+16	± 0.78%	7.8360E+17 ± 0.41%
2801	4.3255E+16	± 0.91%	1.2796E+17	± 0.60%	1.9308E+17	± 0.42%	1.7779E+18	± 0.20%	3.2078E+17	± 0.29%	2.4630E+18 ± 0.19%
2821	4.5331E+16	± 0.89%	1.3424E+17	± 0.58%	1.9974E+17	± 0.41%	1.8161E+18	± 0.20%	3.2653E+17	± 0.29%	2.5220E+18 ± 0.19%
2841	4.1936E+16	± 0.92%	1.2527E+17	± 0.61%	1.9146E+17	± 0.43%	1.7789E+18	± 0.20%	3.2512E+17	± 0.29%	2.4627E+18 ± 0.19%
2861	4.1177E+16	± 0.93%	1.2306E+17	± 0.61%	1.8870E+17	± 0.42%	1.7449E+18	± 0.20%	3.1793E+17	± 0.29%	2.4158E+18 ± 0.19%
2901	1.1196E+16	± 0.67%	2.1884E+16	± 0.49%	2.7845E+16	± 0.34%	1.7447E+17	± 0.20%	3.0952E+16	± 0.29%	2.6635E+17 ± 0.19%

Table E-183. Four-group Neutron Spectrum in safety rods 1-8 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
SSR-1 Inside support	2.1434E+16	± 8.89%	3.0516E+17	± 2.80%	4.1257E+17	± 2.39%	8.4859E+17	± 1.85%	3.1769E+16	± 6.99%	1.6195E+18 ± 1.37%
SSR-1 Inside sheath	2.3808E+16	± 7.87%	3.9339E+17	± 2.12%	4.9070E+17	± 1.84%	9.8486E+17	± 1.51%	7.0858E+16	± 4.70%	1.9636E+18 ± 1.07%
SSR-2 Inside support	1.9185E+16	± 8.40%	3.1881E+17	± 2.64%	4.2805E+17	± 2.26%	8.7859E+17	± 1.88%	3.2529E+16	± 7.54%	1.6772E+18 ± 1.35%
SSR-2 Inside sheath	2.3212E+16	± 6.82%	3.7971E+17	± 2.02%	5.0938E+17	± 1.73%	9.9473E+17	± 1.46%	6.9531E+16	± 4.89%	1.9766E+18 ± 1.03%
SSR-3 Inside support	2.0379E+16	± 9.73%	3.1790E+17	± 2.63%	4.1989E+17	± 2.28%	8.6056E+17	± 1.84%	3.8109E+16	± 7.28%	1.6568E+18 ± 1.35%
SSR-3 Inside sheath	2.3239E+16	± 9.58%	3.8061E+17	± 2.00%	4.9229E+17	± 1.78%	9.7976E+17	± 1.42%	6.8217E+16	± 4.91%	1.9441E+18 ± 1.02%
SSR-4 Inside support	1.9175E+16	± 8.86%	3.3070E+17	± 2.76%	4.1737E+17	± 2.31%	8.9824E+17	± 1.84%	3.3514E+16	± 7.98%	1.6990E+18 ± 1.36%
SSR-4 Inside sheath	1.8788E+16	± 7.59%	3.9388E+17	± 2.22%	4.8261E+17	± 1.71%	9.9720E+17	± 1.48%	7.0724E+16	± 4.78%	1.9632E+18 ± 1.05%
SSR-5 Inside support	1.8844E+16	± 9.44%	3.1496E+17	± 2.66%	4.0400E+17	± 2.30%	8.4894E+17	± 1.87%	3.4560E+16	± 6.96%	1.6213E+18 ± 1.36%
SSR-5 Inside sheath	2.2562E+16	± 6.92%	3.8188E+17	± 1.94%	5.0325E+17	± 1.81%	9.9603E+17	± 1.50%	6.8985E+16	± 4.26%	1.9727E+18 ± 1.04%
SSR-6 Inside support	1.8463E+16	± 8.51%	3.0662E+17	± 2.76%	4.0281E+17	± 2.26%	8.4753E+17	± 1.84%	3.3312E+16	± 7.59%	1.6087E+18 ± 1.35%
SSR-6 Inside sheath	2.1266E+16	± 7.16%	3.6743E+17	± 2.13%	4.8600E+17	± 1.92%	9.5949E+17	± 1.42%	6.8817E+16	± 5.13%	1.9030E+18 ± 1.05%
SSR-7 Inside support	2.2836E+16	± 8.71%	3.1007E+17	± 2.70%	3.9270E+17	± 2.30%	8.2866E+17	± 1.90%	3.3738E+16	± 7.25%	1.5880E+18 ± 1.38%
SSR-7 Inside sheath	2.1209E+16	± 6.81%	3.6020E+17	± 2.06%	4.6248E+17	± 1.70%	9.9142E+17	± 1.43%	6.5961E+16	± 4.60%	1.9013E+18 ± 1.02%
SSR-8 Inside support	2.0532E+16	± 8.56%	2.9179E+17	± 2.72%	3.9499E+17	± 2.31%	8.5806E+17	± 1.83%	3.1065E+16	± 6.84%	1.5964E+18 ± 1.35%
SSR-8 Inside sheath	2.0560E+16	± 6.50%	3.6366E+17	± 2.17%	4.7800E+17	± 1.77%	9.5731E+17	± 1.44%	6.2620E+16	± 4.81%	1.8822E+18 ± 1.04%

Table E-184. Five-group Photon Spectrum in the beam tubes heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
Beam tube HB-1	2.2467E+17	± 1.54%	6.7519E+17	± 1.08%	9.1823E+17	± 0.85%	5.3801E+18	± 0.55%	3.4943E+17	± 1.88%	7.5476E+18 ± 0.45%
Beam tube HB-2	2.4301E+17	± 1.50%	6.9590E+17	± 1.03%	9.5083E+17	± 0.80%	5.4231E+18	± 0.55%	3.4986E+17	± 1.89%	7.6627E+18 ± 0.44%
Beam tube HB-3	2.2687E+17	± 1.51%	6.9229E+17	± 1.04%	9.4765E+17	± 0.80%	5.4087E+18	± 0.55%	3.4828E+17	± 1.80%	7.6237E+18 ± 0.44%
Beam tube HB-6	2.2944E+17	± 1.50%	6.9672E+17	± 1.04%	9.3252E+17	± 0.81%	5.4070E+18	± 0.55%	3.4805E+17	± 1.84%	7.6138E+18 ± 0.44%
Beam tube HB-7	2.4095E+17	± 1.56%	6.8977E+17	± 1.04%	9.6019E+17	± 0.82%	5.4596E+18	± 0.55%	3.4569E+17	± 1.85%	7.6963E+18 ± 0.44%
Beam tube HB-8	2.4196E+17	± 1.49%	7.0534E+17	± 1.02%	9.6102E+17	± 0.79%	5.4467E+18	± 0.53%	3.5163E+17	± 1.84%	7.7066E+18 ± 0.44%
Beam tube HB-9	2.3745E+17	± 1.48%	6.9650E+17	± 1.04%	9.6216E+17	± 0.82%	5.3494E+18	± 0.55%	3.5828E+17	± 1.89%	7.6038E+18 ± 0.44%
Through tube	1.0684E+17	± 1.33%	2.5742E+17	± 0.87%	3.0087E+17	± 0.52%	1.0316E+18	± 0.53%	6.1119E+16	± 1.63%	1.7578E+18 ± 0.40%
Large slant beam tube	6.8984E+16	± 2.20%	1.7715E+17	± 1.50%	2.1125E+17	± 0.92%	7.8169E+17	± 0.87%	4.5881E+16	± 2.71%	1.2850E+18 ± 0.65%

Table E-185. Five-group Photon Spectrum in the hydraulic tube HT-1 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
Between tubes	4.8157E+16	± 5.39%	8.4954E+16	± 4.27%	8.9413E+16	± 2.82%	3.5171E+17	± 2.61%	3.3829E+16	± 6.58%	6.0807E+17 ± 1.85%
Inside inner tube	2.1863E+16	± 15.15%	4.6717E+16	± 11.42%	5.6439E+16	± 7.35%	1.8206E+17	± 6.98%	2.1156E+16	± 14.42%	3.2824E+17 ± 4.69%
Outside sample	2.0231E+17	± 6.84%	2.4293E+17	± 7.46%	2.2193E+17	± 5.62%	7.9014E+17	± 4.76%	5.1058E+16	± 15.48%	1.5084E+18 ± 3.20%
Below inner tube	b		1.6901E+17	± 26.01%	1.2898E+17	± 16.76%	7.8090E+17	± 16.23%	3.4095E+16	± 23.15%	1.1801E+18 ± 11.96%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-186. Five-group Photon Spectrum in the hydraulic tube HT-2 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total
Between upper tubes	1.8323E+16	± 19.29%	8.3444E+16	± 8.06%	1.0861E+17	± 7.58%	4.9557E+17	± 3.58%	3.1290E+16	± 9.76%	7.3723E+17 ± 3.00%
Inside upper inner tube	1.1595E+16	± 24.29%	7.4912E+16	± 12.92%	1.0538E+17	± 10.26%	4.8902E+17	± 5.61%	2.5130E+16	± 17.93%	7.0604E+17 ± 4.56%
Between lower tubes	4.9370E+17	± 2.51%	2.3979E+18	± 1.44%	4.4587E+18	± 1.01%	3.2407E+19	± 0.48%	1.6024E+18	± 1.81%	4.1360E+19 ± 0.42%
Inside lower inner tube	1.5241E+17	± 14.60%	9.2459E+17	± 6.74%	1.2925E+18	± 5.77%	8.6711E+18	± 2.47%	5.6614E+17	± 8.91%	1.1607E+19 ± 2.11%
Outside sample	1.1808E+18	± 3.23%	3.3726E+18	± 2.40%	6.3215E+18	± 1.72%	4.1215E+19	± 0.83%	1.2857E+18	± 3.84%	5.3375E+19 ± 0.71%
Below inner tube	6.1280E+17	± 12.28%	2.9533E+18	± 6.50%	5.0962E+18	± 4.66%	4.5717E+19	± 1.90%	2.9131E+18	± 6.66%	5.7292E+19 ± 1.67%

Table E-187. Five-group Photon Spectrum in the hydraulic tube HT-3 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
Between tubes	4.9613E+16 ± 4.55%	9.5631E+16 ± 3.78%	1.0434E+17 ± 2.89%	3.9047E+17 ± 2.20%	4.2182E+16 ± 6.64%	6.8223E+17 ± 1.61%
Inside inner tube	2.2129E+16 ± 19.55%	4.9576E+16 ± 9.51%	6.0714E+16 ± 6.78%	1.9617E+17 ± 5.88%	2.7540E+16 ± 15.06%	3.5613E+17 ± 4.17%
Outside sample	2.3348E+17 ± 6.18%	2.9868E+17 ± 6.73%	2.7888E+17 ± 5.98%	9.1606E+17 ± 4.20%	4.4825E+16 ± 15.87%	1.7719E+18 ± 2.87%
Below inner tube	8.4224E+16 ± 27.15%	1.6005E+17 ± 23.66%	1.3049E+17 ± 22.39%	6.5759E+17 ± 10.40%	b	1.1285E+18 ± 8.75%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-188. Five-group Photon Spectrum in the hydraulic tube HT-4 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
Between upper tubes	6.3549E+15 ± 19.28%	2.5011E+16 ± 12.75%	4.3528E+16 ± 10.39%	1.8797E+17 ± 6.05%	1.7872E+16 ± 18.99%	2.8074E+17 ± 4.87%
Inside upper inner tube	b	2.7986E+16 ± 23.17%	4.1252E+16 ± 20.36%	1.6976E+17 ± 9.70%	b	2.5906E+17 ± 7.91%
Between lower tubes	4.6166E+17 ± 2.04%	1.5038E+18 ± 1.41%	2.4759E+18 ± 1.07%	1.8772E+19 ± 0.50%	1.3797E+18 ± 1.60%	2.4593E+19 ± 0.44%
Inside lower inner tube	1.7348E+17 ± 8.24%	8.7114E+17 ± 4.43%	1.4572E+18 ± 2.96%	1.0942E+19 ± 1.47%	8.7920E+17 ± 5.17%	1.4323E+19 ± 1.26%
Outside sample	1.6469E+18 ± 2.60%	2.9411E+18 ± 2.46%	4.0667E+18 ± 2.02%	2.6575E+19 ± 1.00%	1.2542E+18 ± 4.21%	3.6484E+19 ± 0.83%
Below inner tube	4.0476E+17 ± 13.57%	1.6724E+18 ± 8.13%	2.7111E+18 ± 5.42%	2.2337E+19 ± 2.49%	2.2455E+18 ± 8.07%	2.9371E+19 ± 2.17%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-189. Five-group Photon Spectrum in the slant tube SH-1 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total ¹
Between upper tubes	3.2537E+17 ± 6.29%	1.5101E+18 ± 3.93%	2.0410E+18 ± 3.23%	1.1847E+19 ± 1.61%	7.9314E+17 ± 4.73%	1.6517E+19 ± 1.36%
Between trans. tubes	3.0158E+17 ± 4.47%	1.6551E+18 ± 2.23%	3.1963E+18 ± 1.48%	2.2833E+19 ± 0.73%	1.1662E+18 ± 2.66%	2.9152E+19 ± 0.64%
Between lower tubes	6.9577E+17 ± 5.16%	2.8461E+18 ± 3.19%	5.5264E+18 ± 2.20%	3.7624E+19 ± 1.01%	1.6863E+18 ± 4.31%	4.8378E+19 ± 0.88%
Outside sample	1.6726E+18 ± 1.33%	3.5525E+18 ± 1.21%	5.7477E+18 ± 0.98%	3.9497E+19 ± 0.48%	1.5269E+18 ± 2.15%	5.1996E+19 ± 0.42%

Table E-190. Five-group Photon Spectrum in the slant tube SH-2 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Between upper tubes	3.2028E+16	± 7.22%	1.6070E+17	± 4.07%	2.1460E+17	± 3.26%	1.1793E+18	± 1.56%	8.1378E+16	± 4.42%	1.6681E+18	± 1.34%
Between trans. tubes	2.7275E+17	± 4.49%	1.6761E+18	± 2.27%	3.1142E+18	± 1.52%	2.2711E+19	± 0.72%	1.1359E+18	± 2.74%	2.8910E+19	± 0.63%
Between lower tubes	7.2869E+17	± 4.87%	2.8222E+18	± 3.19%	5.5357E+18	± 2.20%	3.8907E+19	± 1.00%	1.5897E+18	± 4.29%	4.9584E+19	± 0.87%
Outside sample	1.7140E+18	± 1.31%	3.6200E+18	± 1.22%	5.8035E+18	± 0.96%	3.9474E+19	± 0.48%	1.4822E+18	± 2.04%	5.2094E+19	± 0.41%

Table E-191. Five-group Photon Spectrum in the cold sources CS-1 and CS-2 heavy water between cooling jacket and outer thimble. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
CS-1	1.0051E+17	± 0.94%	2.7068E+17	± 0.68%	3.5382E+17	± 0.49%	1.9743E+18	± 0.34%	2.0095E+17	± 0.79%	2.9003E+18	± 0.28%
CS-2	1.0374E+17	± 0.95%	2.7511E+17	± 0.66%	3.5842E+17	± 0.49%	1.9923E+18	± 0.34%	2.0232E+17	± 0.79%	2.9319E+18	± 0.28%

Table E-192. Five-group Photon Spectrum in the vertical isotope production facility VH-1 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)		Group 2 (2.225 - 6.0 MeV)		Group 3 (1.0 - 2.225 MeV)		Group 4 (50 keV - 1.0 MeV)		Group 5 (Below 50 keV)		Total	
Between tubes	2.2501E+16	± 6.08%	5.7631E+16	± 4.25%	6.3053E+16	± 2.52%	1.6842E+17	± 2.70%	1.0957E+16	± 7.76%	3.2256E+17	± 1.84%
Between IT and holder	2.3116E+16	± 8.06%	5.6643E+16	± 5.15%	6.6622E+16	± 3.28%	1.6534E+17	± 3.42%	8.7797E+15	± 10.49%	3.2050E+17	± 2.28%
Inside target	3.4464E+16	± 13.54%	9.0826E+16	± 9.01%	9.4021E+16	± 5.27%	2.2514E+17	± 5.64%	b		4.4567E+17	± 3.79%
Above target	1.7561E+16	± 17.60%	3.7338E+16	± 14.18%	3.8337E+16	± 6.21%	7.9489E+16	± 9.06%	b		1.7614E+17	± 5.71%

a No particle interactions recorded.
b Poor statistics; value not reported.

Table E-193. Five-group Photon Spectrum in the vertical isotope production facility VH-2 heavy water. Normalized to 330 MHf, with relative errors shown.

Cell Description	Group 1	Group 2	Group 3	Group 4	Group 5	Total
	(Above 6.0 MeV)	(2.225 - 6.0 MeV)	(1.0 - 2.225 MeV)	(50 keV - 1.0 MeV)	(Below 50 keV)	
Between tubes	2.785E+16 ± 5.68%	5.444E+16 ± 4.20%	6.471E+16 ± 2.31%	1.908E+17 ± 2.54%	1.232E+16 ± 8.08%	3.501E+17 ± 1.79%
Between IT and holder	3.023E+16 ± 8.09%	5.677E+16 ± 5.51%	7.096E+16 ± 3.05%	1.774E+17 ± 3.00%	9.438E+15 ± 11.57%	3.448E+17 ± 2.17%
Inside target	4.769E+16 ± 11.62%	8.101E+16 ± 12.47%	1.048E+17 ± 5.17%	2.507E+17 ± 5.08%	3.140E+15 ± 28.36%	4.874E+17 ± 3.75%
Above target	1.678E+16 ± 20.38%	3.408E+16 ± 13.04%	3.696E+16 ± 7.26%	7.482E+16 ± 8.48%	b	1.646E+17 ± 5.61%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-194. Five-group Photon Spectrum in the vertical isotope production facility VH-3 heavy water. Normalized to 330 MHf, with relative errors shown.

Cell Description	Group 1	Group 2	Group 3	Group 4	Group 5	Total
	(Above 6.0 MeV)	(2.225 - 6.0 MeV)	(1.0 - 2.225 MeV)	(50 keV - 1.0 MeV)	(Below 50 keV)	
Between tubes	2.499E+16 ± 5.93%	6.435E+16 ± 3.85%	7.023E+16 ± 2.51%	2.399E+17 ± 2.19%	1.592E+16 ± 6.65%	4.154E+17 ± 1.62%
Between IT and holder	2.514E+16 ± 7.83%	6.620E+16 ± 4.81%	7.395E+16 ± 2.92%	2.397E+17 ± 3.10%	1.054E+16 ± 9.83%	4.155E+17 ± 2.17%
Inside target	3.748E+16 ± 12.82%	9.464E+16 ± 8.06%	1.176E+17 ± 5.58%	3.383E+17 ± 4.36%	4.663E+15 ± 23.82%	5.928E+17 ± 3.28%
Above target	1.478E+16 ± 17.28%	3.091E+16 ± 13.11%	3.409E+16 ± 7.02%	9.146E+16 ± 7.61%	3.433E+15 ± 25.15%	1.746E+17 ± 5.23%

Table E-195. Five-group Photon Spectrum in the vertical isotope production facility VH-4 heavy water. Normalized to 330 MHf, with relative errors shown.

Cell Description	Group 1	Group 2	Group 3	Group 4	Group 5	Total
	(Above 6.0 MeV)	(2.225 - 6.0 MeV)	(1.0 - 2.225 MeV)	(50 keV - 1.0 MeV)	(Below 50 keV)	
Between tubes	2.128E+16 ± 6.10%	4.950E+16 ± 4.60%	5.183E+16 ± 2.46%	1.396E+17 ± 2.80%	1.198E+16 ± 9.85%	2.742E+17 ± 1.96%
Between IT and holder	2.214E+16 ± 7.85%	5.419E+16 ± 5.61%	5.637E+16 ± 3.12%	1.391E+17 ± 3.79%	7.664E+15 ± 13.22%	2.794E+17 ± 2.48%
Inside target	3.458E+16 ± 12.72%	8.350E+16 ± 9.96%	8.500E+16 ± 6.70%	1.894E+17 ± 6.58%	b	3.937E+17 ± 4.32%
Above target	1.160E+16 ± 19.73%	2.949E+16 ± 14.69%	3.262E+16 ± 6.56%	8.745E+16 ± 9.60%	b	1.678E+17 ± 6.28%

a No particle interactions recorded.

b Poor statistics; value not reported.

Table E-196. Five-group Photon Spectrum in the pneumatic tubes PT-1 through PT-5 heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
Inside PT-1	1.0485E+16 ± 7.54%	2.2283E+16 ± 4.79%	3.0630E+16 ± 3.10%	1.1297E+17 ± 2.49%	1.1100E+16 ± 6.91%	1.8746E+17 ± 1.97%
Inside PT-2	4.0963E+15 ± 19.13%	8.8694E+15 ± 13.55%	9.3509E+15 ± 8.10%	3.5968E+16 ± 7.30%	3.1707E+15 ± 21.63%	6.1455E+16 ± 5.68%
Inside PT-3	5.7701E+15 ± 14.95%	1.4566E+16 ± 9.03%	1.2734E+16 ± 5.91%	5.2895E+16 ± 5.70%	7.0057E+15 ± 11.95%	9.2971E+16 ± 4.27%
Inside PT-4	6.9195E+15 ± 12.89%	1.2906E+16 ± 9.12%	1.3421E+16 ± 6.38%	5.9698E+16 ± 5.18%	7.7679E+15 ± 10.30%	1.0071E+17 ± 4.08%
Inside PT-5	3.3856E+15 ± 18.90%	1.0196E+16 ± 12.11%	9.3243E+15 ± 6.99%	4.5419E+16 ± 6.10%	4.6808E+15 ± 13.83%	7.3006E+16 ± 4.96%

Table E-197. Five-group Photon Spectrum in the hot source heavy water. Normalized to 330 MWf, with relative errors shown.

Cell Description	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
Inside outer shell	7.2552E+16 ± 3.07%	2.4207E+17 ± 1.88%	2.5919E+17 ± 1.52%	6.6719E+17 ± 1.20%	1.3961E+15 ± 15.68%	1.2424E+18 ± 0.88%
Inside thimble end	1.1444E+17 ± 2.49%	3.1912E+17 ± 1.59%	3.4002E+17 ± 1.20%	1.7038E+18 ± 0.86%	1.4600E+17 ± 2.38%	2.6233E+18 ± 0.67%
Inside thimble	1.5060E+17 ± 2.40%	3.6137E+17 ± 1.63%	4.7651E+17 ± 1.22%	1.4917E+18 ± 0.96%	9.3299E+16 ± 2.82%	2.5735E+18 ± 0.74%

Table E-198. Five-group Photon Spectrum (m^2s^{-1}) in the Borated Fuel Endplates. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
537.00	3.0153E+17 ± 3.18%	4.2113E+18 ± 0.96%	9.9246E+18 ± 0.61%	4.6712E+19 ± 0.35%	5.2431E+17 ± 2.48%	6.1674E+19 ± 0.31%
20.00	6.6656E+17 ± 2.26%	8.5232E+18 ± 0.68%	2.0554E+19 ± 0.42%	1.0439E+20 ± 0.23%	1.1177E+18 ± 1.64%	1.3525E+20 ± 0.21%
-20.00	6.4678E+17 ± 2.50%	8.0951E+18 ± 0.77%	1.9400E+19 ± 0.49%	1.1638E+20 ± 0.26%	1.2116E+18 ± 2.03%	1.4574E+20 ± 0.23%
-537.00	5.2134E+17 ± 2.83%	6.7950E+18 ± 0.92%	1.6491E+19 ± 0.56%	7.6437E+19 ± 0.33%	7.3238E+17 ± 2.24%	1.0098E+20 ± 0.29%

Table E-199. Five-group Photon Spectrum (m^2s^{-1}) in the Stainless Steel (SS-316) Bolts for Core Pressure Boundary Tube. Normalized to 330 MWf, with relative errors shown. Points given are midpoints of cells.

Distance (mm) above Midplane	Group 1 (Above 6.0 MeV)	Group 2 (2.225 - 6.0 MeV)	Group 3 (1.0 - 2.225 MeV)	Group 4 (50 keV - 1.0 MeV)	Group 5 (Below 50 keV)	Total
2281.40	^a	^b	4.3987E+15 $\pm$ 22.58%	^b	^b	2.1772E+16 $\pm$ 25.12%
-1521.50	5.0834E+16 $\pm$ 27.98%	1.2973E+17 $\pm$ 24.43%	1.1266E+17 $\pm$ 13.61%	3.1785E+17 $\pm$ 11.09%	^b	6.2253E+17 $\pm$ 8.38%

^a No particle interactions recorded.

^b Poor statistics; value not reported.