August 2021

Revision 21B

MAGNASTOR®

(Modular Advanced Generation Nuclear All-purpose STORage)

FINAL SAFETY ANALYSIS REPORT

Amendment 11 RAI Responses

NON-PROPRIETARY VERSION

Docket No. 72-1031

NAC INTERNATIONAL

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Enclosure 1

NAC INTERNATIONAL

RESPONSE TO THE

UNITED STATES
NUCLEAR REGULATORY COMMISSION

NON-PROPRIETARY REQUEST FOR ADDITIONAL INFORMATION

February 2021

FOR REVIEW OF THE CERTIFICATE OF COMPLIANCE NO. 1031, AMENDMENT NO. 10

(EPID No. L-2020-LLA-0158 DOCKET NO. 72-1031)

August 2021

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NAC INTERNATIONAL RESPONSE
TO
REQUEST FOR ADDITIONAL INFORMATION

STRUCTURAL EVALUATION

3-1 For the tip-over analysis, demonstrate how angular velocity alone will ensure that the g-loads at the top of the basket and at the top of the canister lid for the concrete cask (CC) number 7 model are essentially the same or bounded by the CC1 model.

The applicant did not perform a tip-over analysis for the CC7 in MAGNASTOR SAR Revision 20C that was submitted in support of Amendment No. 11 but stated that the g-loads were essentially the same or bounded by the g-loads for the CC1 model. The NRC staff had approved a tip-over analysis for the CC1 in the original licensing basis for the MAGNASTOR FSAR, Revision 0 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14176B275), that used a finite element model in the LS-DYNA computer software to calculate the g-loads.

Instead, the applicant appeared to have used a simplified approach that first calculated an angular velocity of the CC7, ω7, and compared it with the angular velocity of the CC1, ω1. The calculated ratio (ω7/ω1) was 1.000. Given the similar angular velocity and similar geometry between the CC7 and other concrete casks (CC1, CC3, CC5, CC6), the applicant concluded that no tip-over analysis using LS-DYNA was needed.

However, previous experience with Cask No. CC5 has shown that ratioing angular velocities can lead to erroneous cask g-loads when compared to LS-DYNA due to the complex nature of nonlinear impact dynamics. For angular velocity alone to be used as a generic screening approach to calculate cask g-loads, it has to be shown to produce essentially the same results when compared to LS-DYNA results for model CC1. A benchmarking effort (compared LS-DYNA results) to develop the data to demonstrate this would be one approach, coupled with clear limits defined for the appropriate configuration parameters to ensure that the g-loads remain essentially the same or bounded by the previous licensing approach (LS-DYNA). The proposed approach does not address the below configuration parameters:

- materials properties (soils underneath the ISFSI pad, pad concrete, cask concrete, cask reinforcement, pad reinforcement, steel liner, basket, and fuel);
- mass distribution;
- geometric and material nonlinear behavior under time-dependent dynamic impact loading conditions; and
- Interaction between soil-to-pad, pad-to-cask, and cask-to-internals (liner, basket and fuels) based on impact physics that handles phenomena such as: stress wave generation, stress wave reflection, stress wave oscillation, local deformation, transient stresses, and transient forces.

Since the above factors may affect the design of the CC7, provide the change in values on the design basis g load factors used for CC1 and how they will envelope previously analyzed CC1 results. Confirm that the stress analysis of CC7 has been updated based on analysis as

necessary.

The staff needs this additional information to be able to conclude that the g-loads at the top of the basket and top of the canister for the CC7 model are essentially the same or bounded by the CC1 model under a tip-over event for the proposed approach.

This information is needed to determine compliance with 10 CFR 72.236(b).

NAC International Response to Thermal Evaluation RAI 3-1:

Although the CC7 cask is very similar to previous concrete casks, the tip-over of the concrete cask onto the pad using the soil properties defined in Section 3.10.4 was performed as documented in NAC Calculation No. 71160-2031 Rev 0. The peak accelerations for the top of the basket and the TSC are determined to be 25.5g and 27.2g respectively. These are bounded by the accelerations reported in FSAR Section 3.7.3.7.

NAC INTERNATIONAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

THERMAL EVALUATION

4-1 Discuss the omission of 2-Phase flow (boiling) from the FLUENT analysis during the first 85 seconds of the transient analysis of the transportable storage canister (TSC) during helium cooldown and address what effect the inclusion of 2-Phase flow in the analysis model might have on component temperatures for the TSC including fuel cladding temperatures.

The ANSYS and ANSYS FLUENT models that were developed for the thermal analysis of the MAGNASTOR system are described in the SAR (Page 4.11.1-1) as follows:

"For the TSC transfer operations, two types of three-dimensional models are used for each of PWR [pressurized-water reactor], BWR and BWR DF [damaged fuel] configurations: (1) three-dimensional FLUENT models for the transfer cask and the TSC model as described in Section 4.11.1.4 and (2) three-dimensional ANSYS models for the loaded TSC as presented in Section 4.11.1.5. The FLUENT models are used to perform steady state or transient analyses for the water or helium backfilled phases of the TSC. The ANSYS models are used to perform transient analyses for the vacuum drying conditions of the transfer operation. Note that these thermal models consider a water inlet temperature of 70°F and a flowrate of 40 GPM (upflow) for the ACWS (Annulus Circulating Water cooling System) used during TSC transfer operation."

Considering the following MAGNASTOR computational fluid dynamics (CFD) analysis models described in the Calculation Package No. 71160-3065, Rev 1, "MAGNASTOR Transfer Cask Transient Thermal Analyses for BWR Preferential Loading" Appendix F, for the transient analysis of the TSC during helium cooldown, with use of annulus cooling, a review of the FLUENT analysis results indicates that water in the annular gap between the TSC and the transfer cask would boil during the first 85 seconds of the transient; however, boiling of water (2-Phase flow) is not included in the FLUENT model, nor is it discussed in the SAR analysis. The indicated water temperature in the annular gap is more than 400 K (with a maximum of 439 K) and boiling of water occurs at 373K. The given approach may underpredict the amount of heat transfer during the time that the water in the annulus is boiling and therefore the reported temperature transient could be in error, as it is not known how long the boiling of the water will last.

This information is needed to determine compliance with 10 CFR 72.236(b) and 72.236(f).

<u>NAC International Response to Thermal Evaluation RAI 4-1:</u>

Appendix F in the NAC Calculation 71160-3065 Rev. 1 shows a peak canister shell temperature of 470°F at the time the TSC is backfilled with helium for the cooling operation using ACWS. To determine the time for the annulus water flow to return to liquid, an analysis of the water in the annulus was performed using RELAP5. The initial temperature profiles of the TSC shell and the transfer cask inner shell are obtained from Calculation No. 71160-3065 at the beginning of

the helium cooldown (with the maximum TSC shell temperature of 470°F). The RELAP5 analysis is documented in NAC Calculation 71160-3056 Rev. 0, "RELAP5 Evaluation for the Annulus Cooling water at the End of Vacuum Drying". In the analysis, the annulus is considered to be a closed system. The analysis shows that the liquid conditions for the annulus flow are achieved in 254 seconds. Note that the minimum cooling time is 12 hours per LCO 3.1.1 for the TSC transfer using LMTC. With the limited steam condition in the annulus, the loss of cooling is limited to be approximately 4 minutes at the beginning of the 12 hours cooling time. Therefore, the steam condition of the annulus water has a negligible effect on the cooling operation for the TSC and the corresponding temperature results as reported in the FSAR.

NAC INTERNATIONAL RESPONSE
TO
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THERMAL EVALUATION

4-2 Compare and provide a discussion of the total heat transferred in the two-dimensional (2-D) axisymmetric model presented in Section 4.11.1.1 of the SAR and the quarter-symmetry three-dimensional (3-D) model of the TSC presented in Section 4.11.1.2 of the SAR. Provide a justification for the efficacy of applying heat transfer coefficients calculated from the 2-D axisymmetric model to the 3-D model of the TSC. Provide a discussion of the 3-D model temperature results (including the peak cladding temperature) in light of any discrepancies identified between the two models.

The ANSYS FLUENT models that were developed for the thermal analysis of the MAGNASTOR system are described in the SAR (Page 4.11.1-1) as follows:

"Two-dimensional axisymmetric models are used for TSC and the concrete cask (for storage conditions) to generate the boundary conditions for three-dimensional quarter-symmetry model for TSC with PWR fuel and the eighth-symmetry model for TSC with BWR fuel. The need for the three-dimensional symmetry models is to accurately model the significant variation of the fuel assembly heat load in the basket.

Section 4.11.1.1 describes the two-dimensional axisymmetric models of the concrete cask and TSC for PWR and BWR configurations. The models are used to perform steady state FLUENT analysis for the normal, off-normal and accident conditions of storage. The TSC temperature profile from these analyses are applied as the boundary conditions on the three-dimensional quarter-symmetry (PWR) or eighth-symmetry (BWR) model of the TSC."

As described above and further in Section 4.11.1.2 of the SAR, a quarter-symmetry 3-D model of the TSC was developed to calculate peak cladding temperature (PCT) of the stored fuel and this section also states: "The temperature profile at the TSC outer surfaces from the two-dimensional axisymmetric models discussed in Section 4.11.1.1 are applied as the boundary conditions in three-dimensional models." Based on an examination of the 3-D fluent model, heat transfer coefficients calculated using the 2-D axisymmetric model were applied to the 3-D model instead of a temperature profile as stated in the SAR.

Considering the following MAGNASTOR CFD analysis models described in the calculation package: 71160-3085 Rev 1, *"MAGNASTOR Concrete Cask and PWR Canister Thermal Evaluation for High Heat Loads"*, Chapter 6, the 3-D ANSYS FLUENT case, however, does not use a temperature profile but instead uses heat transfer coefficients which are obtained from the 2-D analysis results. The heat distribution between these two models (the 2-D and 3-D) should be very similar; however, in reviewing the heat distribution between the two models, the staff noted some inconsistencies. For example: for the total heat transferred radially from the fuel, there is a difference of about 1271 W between the two models. For the heat transferred out the top and bottom TSC surfaces the differences are about 731 W and 502 W, respectively. Overall, there is a heat balance in the two models; however, given the small margin to the allowable limit for PCT, the discrepancies in the heat distribution between the two models should be explained.

This information is needed to determine compliance with 10 CFR 72.236(b) and 72.236(f).

NAC International Response to Thermal Evaluation RAI 4-2:

For the PWR configuration, NAC calculation 71160-3085 was revised (to Revision 2) to modify the boundary conditions on the TSC top and bottom surfaces of the three-dimensional TSC model, to ensure that the heat transfer rates between the two-dimensional (2D) and three-dimensional (3D) models agree for all TSC surfaces for the thermal evaluations.

All cases and results of NAC calculation 71160-3085 were updated and the associated FSAR sections (Sections 4.11.2.1.1, 4.11.3, 4.11.4 and 4.11.5) were revised accordingly.

For the BWR configuration, NAC calculations 71160-3060 and 71160-3071 were also revised (to Revision 2) to include a sensitivity analysis to evaluate the effect of the boundary conditions used for the 3D TSC model. Maximum fuel temperature from the 3D model with the revised boundary conditions was lower than the maximum temperature from the 3D model using temperature profile boundary conditions. Based on this sensitivity analysis, the maximum fuel temperatures calculated from the exiting models with temperature profile boundary conditions are conservative. Therefore, no further analysis is required and no revision to the FSAR is required for the BWR configuration.

Note that FSAR Section 4.11 was also updated to consider PWR fuel types of 15×15, 16×16 and 17×17 for High Heat Load configurations and incorporated the revised PWR thermal analysis results for storage and transfer conditions using the updated effective thermal properties for fuel assemblies.

Enclosure 2

List of Changes

for

MAGNASTOR® FSAR, Amendment 11 RAI Responses
Revision 21B

(Docket No 72-1031)

NAC International

August 2021

List of Changes for the MAGNASTOR® FSAR, Revision 21B

Note: The List of Effective Pages and the Chapter Table of Contents, List of Figures, and List of Tables have been revised accordingly to reflect the list of changes detailed below.

Chapter 1

- No changes.

Chapter 2

- Page 2.2-2, modified text in the third and fourth paragraphs on the page in Section 2.2.1 where indicated.
- Page 2.2-5, modified the last two rows of the table in Figure 2.2-1 where indicated.
- Page 2.2-8, modified the first row of Table 2.2-1 and modified text in footnote "a" where indicated.

Chapter 3

- Pages 3.11.3-28, modified last paragraph of Section 3.11.3.4.7 where indicated.

Chapter 4

- Page 4.11-1, modified text in the middle of Section 4.11 where indicated.
- Page 4.11.1-1, modified the second paragraph of Section 4.11.1 where indicated.
- Page 4.11.1-2, modified the last paragraph of Section 4.11.1 where indicated.
- Pages 4.11.1-3 thru 4.11.1-4, modified the first paragraph of Section 4.11.1.2 and the second paragraph of Section 4.11.1.2.1 where indicated.
- Pages 4.11.1-5 thru 4.11.1-49, text flow changes.
- Page 4.11.2-1, modified text in Section 4.11.2.1.1 where indicated.
- Page 4.11.2-3, modified Table 4.11.2.1-1 where indicated.
- Page 4.11.2-4, modified text in Section 4.11.2.2.1 where indicated.
- Pages 4.11.2-7 thru 4.11.2-8, modified Tables 4.11.2.2-2 thru 4.11.2.2-6 where indicated.
- Page 4.11.2-12, modified text in Section 4.11.2.3 where indicated.
- Page 4.11.3-1, modified first embedded table in Section 4.11.3.1 where indicated.
- Page 4.11.3-2, modified last paragraph of Section 4.11.3.1 where indicated.
- Page 4.11.4-1, modified the second paragraph and first embedded table of Section 4.11.4.1 where indicated.
- Pages 4.11.4-2 thru 4.11.4-3, modified text in Sections 4.11.4.2 thru 4.11.4.4 where indicated.
- Page 4.11.5-1, modified text in Section 4.11.5 where indicated.

Chapter 5

- No changes.

Chapter 6

- No changes.

Chapter 7

- No changes.

Chapter 8

- No changes.

Chapter 9

- No changes.

Chapter 10

- No changes.

Chapter 11

- No changes.

Chapter 12

- No changes.

Chapter 13

- No changes.

Chapter 14

- No changes

Chapter 15

- No changes

Enclosure 3

Supporting Calculations

for

MAGNASTOR® FSAR, Amendment 11 RAI Responses
Revision 21B

(Docket No 72-1031)

NAC International

August 2021

List of Calculations:

1. 71160-2031 Rev 0
2. 71160-3056 Rev 0
3. 71160-3060 Rev 2
4. 71160-3071 Rev 2
5. 71160-3081 Rev 3
6. 71160-3085 Rev 2
7. 71160-3086 Rev 2
8. 71160-3087 Rev 2

CALCULATIONS WITHHELD IN THEIR ENTIRETY PER 10 CFR 2.390

Enclosure 4

Proposed Changes

for

MAGNASTOR® Certificate of Compliance, Amendment 11
RAI Responses, Revision 21B

(Docket No 72-1031)

NAC International

August 2021

APPENDIX B

PROPOSED APPROVED CONTENTS
FOR THE MAGNASTOR SYSTEM

AMENDMENT 11

Appendix B
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1.0 FUEL SPECIFICATIONS AND LOADING CONDITIONS

The MAGNASTOR SYSTEM is designed to safely store up to 37 undamaged PWR fuel assemblies in the 37 PWR Basket Assembly or up to 89 undamaged BWR fuel assemblies in the BWR Basket Assembly. The PWR DF basket has a capacity of up to 37 undamaged PWR fuel assemblies including 4 DFC locations. The BWR DF basket has a capacity of up to 81 undamaged BWR fuel assemblies including 12 DFC locations. Each DFC may contain an undamaged fuel assembly, a damaged fuel assembly, or FUEL DEBRIS equivalent to one fuel assembly. FUEL DEBRIS is included in the definition of DAMAGED FUEL (Appendix A, Section 1.1). UNDAMAGED FUEL assemblies may be placed directly in the DFC locations of a DF Basket Assembly without the use of a DFC.

The system requires few operating controls. The principal controls and limits for MAGNASTOR are satisfied by the selection of fuel for storage that meets the Approved Contents presented in this section and in the tables for MAGNASTOR design basis spent fuels.

If any Fuel Specification or Loading Condition of this section is violated, the following actions shall be completed:

- The affected fuel assemblies shall be placed in a safe condition.
- Within 24 hours, notify the NRC Operations Center.
- Within 60 days, submit a special report that describes the cause of the violation and actions taken to restore or demonstrate compliance and prevent reoccurrence.

2.0 FUEL TO BE STORED IN THE MAGNASTOR SYSTEM

UNDAMAGED PWR FUEL ASSEMBLIES, DAMAGED PWR FUEL ASSEMBLIES, PWR FUEL DEBRIS (PWR DAMAGED FUEL), UNDAMAGED BWR FUEL ASSEMBLIES, DAMAGED BWR FUEL ASSEMBLIES, BWR FUEL DEBRIS (BWR DAMAGED FUEL), and NONFUEL HARDWARE meeting the limits specified in this section may be stored in the MAGNASTOR SYSTEM.

Table B2-1 TSC with PWR Fuel Limits

I. TSC with PWR Basket Assembly and PWR DF Basket Assembly

A. Allowable Contents

1. Uranium PWR UNDAMAGED SNF ASSEMBLIES and DAMAGED FUEL (PWR DAMAGED SNF ASSEMBLIES or PWR FUEL DEBRIS) that meet the following specifications:

a. Cladding Type:	Zirconium-based alloy.
b. Physical Characteristics	The physical characteristics of the different PWR SNF ASSEMBLIES are defined in Table B2-3.
c. Maximum Enrichment	The fuel type specific maximum enrichments as a function of neutron absorber sheet areal density at various minimum soluble boron levels are defined in Table B2-4. For variable enrichment SNF assemblies, maximum SNF enrichments represent peak rod/pellet enrichments.
d. Decay Heat per SNF Assembly	Load pattern dependent allowed heat loads for each fuel storage location illustrated in Figure B2-1 are shown in Table B2-2. Links to correlate allowed heat load to load tables are summarized in Table B2-8. Load tables contain minimum SNF cool time as a function of maximum SNF assembly average burnup and minimum assembly average enrichment.
e. Nominal Fresh SNF Assy: Length (in)	≤ 178.3
f. Nominal Fresh SNF Assembly Width (in.):	≤ 8.54
g. Weight Per Storage location (lbs.)	≤ 1,765, including SNF Assembly, NONFUEL HARDWARE, and fuel spacer ≤ 1,1814, including SNF Assembly, NONFUEL HARDWARE, DFC and fuel spacer in a DF location
h. Non-DF Basket - Total Canister Contents Weight (lbs.)	≤ 62,160, including SNF Assemblies, NONFUEL HARDWARE and fuel spacers
i. DF Basket -Total Canister Contents Weight (lbs.)	≤ 61,184, including SNF Assemblies, NONFUEL HARDWARE, DFCs and fuel spacers
j. Total Canister Weight including Contents (lbs.)	≤ 104,500 (nominal TSC weight plus maximum contents)

(continued)

Table B2-1 TSC with PWR Fuel Limits (continued)

B. Quantity per TSC: Up to a total of 37 PWR UNDAMAGED SNF ASSEMBLIES including up to four (4) DFCs containing PWR UNDAMAGED SNF ASSEMBLIES, PWR DAMAGED SNF ASSEMBLIES, and/or PWR FUEL DEBRIS. DFCs may only be loaded in the DFC basket and are limited to locations No. 4, 8, 30 and 34, as shown on Figure B2-1.

C. The contents of a DFC must be less than, or equivalent to, one PWR UNDAMAGED SNF ASSEMBLY. PWR SNF ASSEMBLIES loaded in a DFC shall not contain NONFUEL HARDWARE with the exception of instrument tube tie components, guide tube anchors or steel inserts, and similar devices.

D. SNF assembly lattices not containing the nominal number of fuel rods specified in Table B2-3 must contain solid filler rods that displace a volume equal to, or greater than, that of the fuel rod that the filler rod replaces. An unenriched rod may be used as a replacement rod to return a fuel assembly to an undamaged condition. SNF assemblies may have stainless steel rods inserted to displace guide tube "dashpot" water.

E. PWR UNDAMAGED SNF ASSEMBLIES not loaded in a DFC may contain NONFUEL HARDWARE. NONFUEL HARDWARE cool times shall be in accordance with Tables B2-6, and B2-7. Alternatively, the ^{60}Co curie limits in Tables B2-6 and B2-7 may be used to establish site-specific NONFUEL HARDWARE constraints. Alternatively, the ^{60}Co curie limits in Tables B2-6 and B2-7 may be used to establish site-specific NONFUEL HARDWARE constraints.

F. Spacers may be used in a TSC to axially position PWR UNDAMAGED SNF ASSEMBLIES, and DFCs to facilitate handling and operation.

G. Unenriched fuel assemblies and unirradiated (i.e., not inserted in-core) fuel assemblies are not authorized for loading. Unenriched end blankets are permitted, provided that the nominal length of the end blanket is not greater than six (6) inches. Annular fuel pellet blankets are permitted.

H. RCCs are limited to fuel cell location, minimum cool time, and maximum exposure based on load pattern and fuel type:

Minimum Cool Time (years)	Maximum Exposure (GWd/MTU)	Fuel Type	Load Pattern	Allowed Fuel Storage Locations (per Figure B2-1)
10	180	All	All	A
2.5		WE14x14	A, C	A
5.0		CE16x16	A, C	A
14	270	All	All	A
20	360	All	All	A

(continued)

Table B2-1 TSC with PWR Fuel Limits (continued)

I. One Neutron Source, or Neutron Source Assembly (NSA) is permitted to be loaded in a TSC in fuel storage locations No. 11, 12, 13, 18, 19, 20, 25, 26 or 27 (Figure B2-1). Neutron source assemblies may contain source rods attached to hardware similar in configuration to guide tube plug devices (thimble plugs) and burnable absorbers, in addition to containing burnable poison rodlets and/or thimble plug rodlets. For NSAs containing absorber rodlets, the BPAA cool time and burnup/exposure or hardware ^{60}Co curie limit listed in Table B2-6 are applied to the neutron sources. NSAs having only thimble plug rodlets require the thimble plug restriction in Table B2-7 to be applied. Combination NSAs, containing both thimble plug and burnable absorber rodlets must apply the more limiting of the two minimum cool time/curie limit.

J. Fuel assemblies may contain any number of unirradiated (i.e., not inserted in-core) nonfuel solid filler fuel replacement rods. Steel rods are limited to a 32.5 GWd/MTU maximum burnup/exposure. In-core activated stainless steel rods are limited to minimum cool time, quantity and fuel storage locations:

Fuel Storage Location (per Figure B2-1)	Number of Assemblies per Cask	Maximum number of Rods per Assembly and Minimum Cool Time
Any	1	Maximum of 5 rods

K. Fuel assemblies may contain an HFRA at a maximum burnup/exposure of 4.0 GWd/MTU and a minimum cool time of 16 years.

L. PLSA assemblies are permitted for loading provided they are limited to Region A (center 9 basket storage locations) at a maximum assembly average burnup of 40 GWd/MTU, a minimum assembly average enrichment of 1.2 wt% U-235 and a minimum cool time of 6.5 years.

Table B2-2 PWR Fuel Loading Patterns

Loading Pattern and Max Heat Load per Storage Location (W)[1]							
Storage Location	**A**	**B**	**C**	**D**	**I**	**J**	**K**
A1	959	922	513	811	1380[3]	600	600
A2						400	400
A3							
B1		1,200	1,800			1250	700
B2			1,300			800	1900
B3							
C1		800	830			1250	800
C2						800	2500
C3						1250	800
C4						3250	
C5						800	2500
Max Heat Load per Cask	35,500	35,500	35,500	30,000	42,500	42,000	42,000
Pattern Use Limitations on Cask Configuration	None	None	None	PMTC	3" Liner and Heat Shield CC/LMTC	3" Liner and Heat Shield CC/LMTC	3" Liner and Heat Shield CC/LMTC
Pattern Use Limitations on Fuel Type	See Note (2)	See Note (2)	CE16x16 or WE14x14 Only	CE16x16 Only	Excludes CE14 and WE14	Excludes CE14 and WE14	Excludes CE14 and WE14

Notes:

- Locations per Figure B2-1.
- Listed heat load is combined total of fuel assembly and nonfuel hardware, if applicable.

(1) Loading patterns are referred to in the FSAR as follows:
- A – Uniform Loading Pattern
- B – Preferential Three-Zone Loading Pattern
- C – Preferential Four-Zone Loading Pattern (with Reduced Col Times)
- D – Uniform PMTC Loading Pattern
- I – Loading Pattern I or 37P-I
- J – Loading Pattern J or 37P-J
- K – Loading Pattern K or 37P-K

(2) Uniform Loading Pattern Limitations:
- All fuel types listed in in Table B2-3 are permitted in Concrete Casks.

(3) Loading Pattern I with heat load in any storage location above 1148W (uniform load) requires the following additional limits:
a. Assemblies with highest loads must be stored in Zone B.
b. Assemblies with lowest heat loads must be stored in Zone A, the lowest heat load in location A2.
c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (3)a. and (3)b.

Table B2-3 Bounding PWR Fuel Physical Characteristics

Assembly Type	Assembly Subtype	No. of Fuel Rods	No. of Guide Tubes[1]	Geometry [2] Max Pitch (inch)	Min Clad OD (inch)	Min Clad Thick. (inch)	Max Pellet OD (inch)	Max Active Length (inch)	Max Load (MTU)
BW15x15	BW15H1	208	17	0.568	0.43	0.0265	0.3686	144.0	0.4858
	BW15H2	208	17	0.568	0.43	0.025	0.3735	144.0	0.4988
	BW15H3	208	17	0.568	0.428	0.023	0.3742	144.0	0.5006
	BW15H4	208	17	0.568	0.414	0.022	0.3622	144.0	0.4690
BW17x17	BW17H1	264	25	0.502	0.377	0.022	0.3252	144.0	0.4799
CE14x14	CE14H1	176	5	0.58	0.44	0.026	0.3805	137.0	0.4167
CE16x16	CE16H1	236	5	0.5063	0.382	0.025	0.3255	150.0	0.4463
WE14x14	WE14H1	179	17	0.556	0.40	0.0162	0.3674	145.2	0.4188
WE15x15	WE15H1	204	21	0.563	0.422	0.0242	0.3669	144.0	0.4720
	WE15H2	204	21	0.563	0.417	0.0265	0.357	144.0	0.4469
WE17x17	WE17H1	264	25	0.496	0.372	0.0205	0.3232	144.0	0.4740
	WE17H2	264	25	0.496	0.36	0.0225	0.3088	144.0	0.4327

[1] Combined number of guide and instrument tubes.
[2] Assembly characteristics represent cold, unirradiated, nominal configurations.

Table B2-4 Bounding PWR Fuel Assembly Loading Criteria – Enrichment/Soluble Boron Limits

TSC Containing Only Undamaged Fuel – Max. Initial Enrichment (wt % 235U)															
	Absorber[1] 0.036 ^{10}B g/cm^2					Absorber[1] 0.030 ^{10}B g/cm^2					Absorber[1] 0.027 ^{10}B g/cm^2				
Soluble Boron	1500 (ppm)	1750 (ppm)	2000 (ppm)	2250 (ppm)	2500 (ppm)	1500 (ppm)	1750 (ppm)	2000 (ppm)	2250 (ppm)	2500 (ppm)	1500 (ppm)	1750 (ppm)	2000 (ppm)	2250 (ppm)	2500 (ppm)
BW15H1	3.7%	4.1%	4.4%	4.7%	5.0%	3.6%	4.0%	4.2%	4.5%	4.8%	3.6%	3.9%	4.2%	4.5%	4.8%
BW15H2	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.8%	3.6%	3.8%	4.1%	4.4%	4.7%
BW15H3	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.4%	4.7%	3.5%	3.8%	4.1%	4.4%	4.7%
BW15H4	3.8%	4.2%	4.5%	4.8%	5.0%	3.7%	4.1%	4.4%	4.7%	5.0%	3.7%	4.0%	4.3%	4.6%	5.0%
BW17H1	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.8%	3.6%	3.9%	4.1%	4.5%	4.7%
CE14H1	4.5%	4.8%	5.0%	5.0%	5.0%	4.3%	4.7%	5.0%	5.0%	5.0%	4.3%	4.6%	5.0%	5.0%	5.0%
CE16H1	4.4%	4.8%	5.0%	5.0%	5.0%	4.3%	4.6%	5.0%	5.0%	5.0%	4.2%	4.6%	4.9%	5.0%	5.0%
WE14H1	4.7%	5.0%	5.0%	5.0%	5.0%	4.6%	5.0%	5.0%	5.0%	5.0%	4.5%	5.0%	5.0%	5.0%	5.0%
WE15H1	3.8%	4.2%	4.5%	4.8%	5.0%	3.7%	4.1%	4.4%	4.7%	5.0%	3.7%	4.0%	4.3%	4.6%	4.9%
WE15H2	4.0%	4.4%	4.7%	5.0%	5.0%	3.9%	4.2%	4.6%	4.9%	5.0%	3.8%	4.2%	4.5%	4.8%	5.0%
WE17H1	3.7%	4.1%	4.4%	4.7%	5.0%	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.9%
WE17H2	4.0%	4.3%	4.7%	5.0%	5.0%	3.9%	4.3%	4.6%	4.9%	5.0%	3.8%	4.2%	4.5%	4.9%	5.0%
TSC Containing Damaged Fuel – Max. Initial Enrichment (wt % ^{235}U)															
BW15H1	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.7%	3.6%	3.8%	4.1%	4.4%	4.7%
BW15H2	3.6%	3.9%	4.2%	4.5%	4.8%	3.6%	3.8%	4.1%	4.4%	4.7%	3.5%	3.8%	4.1%	4.3%	4.6%
BW15H3	3.6%	3.9%	4.2%	4.5%	4.8%	3.5%	3.8%	4.1%	4.4%	4.6%	3.5%	3.8%	4.0%	4.3%	4.6%
BW15H4	3.8%	4.1%	4.4%	4.7%	5.0%	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.8%
BW17H1	3.6%	3.9%	4.2%	4.5%	4.8%	3.6%	3.9%	4.1%	4.4%	4.7%	3.5%	3.8%	4.1%	4.4%	4.6%
CE14H1	4.4%	4.8%	5.0%	5.0%	5.0%	4.3%	4.7%	5.0%	5.0%	5.0%	4.3%	4.6%	4.9%	5.0%	5.0%
CE16H1	4.4%	4.7%	5.0%	5.0%	5.0%	4.2%	4.6%	5.0%	5.0%	5.0%	4.2%	4.5%	4.9%	5.0%	5.0%
WE14H1	4.6%	5.0%	5.0%	5.0%	5.0%	4.5%	5.0%	5.0%	5.0%	5.0%	4.5%	4.9%	5.0%	5.0%	5.0%
WE15H1	3.8%	4.1%	4.4%	4.7%	5.0%	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	4.0%	4.3%	4.6%	4.8%
WE15H2	3.9%	4.3%	4.6%	4.9%	5.0%	3.8%	4.2%	4.5%	4.8%	5.0%	3.8%	4.1%	4.4%	4.7%	5.0%
WE17H1	3.7%	4.0%	4.3%	4.6%	4.9%	3.6%	3.9%	4.2%	4.5%	4.8%	3.6%	3.9%	4.2%	4.5%	4.8%
WE17H2	3.9%	4.3%	4.6%	5.0%	5.0%	3.9%	4.2%	4.5%	4.9%	5.0%	3.8%	4.1%	4.5%	4.8%	5.0%

- Specified soluble boron concentrations are independent of whether an assembly contains a nonfuel insert.

1 Borated aluminum neutron absorber sheet effective areal ^{10}B density.

Table B2-5 Additional SNF Assembly Cool Time Required to Load NONFUEL HARDWARE

		Pattern A	Pattern B			Pattern C			
		Storage Location	Storage Location			Storage Location			
Assembly		A	A	B	C	A	B1	B2	C
CE 14x14	BPAA/HFRA	--	--	--	--	--	--	--	--
	GTPD/NSA	--	--	--	--	--	--	--	--
	RCC	0.2	0.2	0.1	0.2	--	--	--	--
WE 14x14	BPAA/HFRA	0.5	0.5	0.2	0.7	1.4	0.1	0.1	0.7
	GTPD/NSA	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
	RCC	0.7	2.3	0.7	4.1	2.2	0.2	0.1	1.0
WE 15x15	BPAA/HFRA	0.5	0.6	0.2	0.8	--	--	--	--
	GTPD/NSA	0.1	0.1	0.1	0.1	--	--	--	--
	RCC	3.1	3.4	1.5	4.5	--	--	--	--
B&W 15x15	BPAA/HFRA	0.1	0.1	0.1	0.1	--	--	--	--
	GTPD/NSA	0.1	0.1	0.1	0.1	--	--	--	--
	RCC	0.2	0.2	0.1	0.2	--	--	--	--
CE 16x16	BPAA/HFRA	--	--	--	--	--	--	--	--
	GTPD/NSA	--	--	--	--	--	--	--	--
	RCC	0.4[1]	0.2	0.1	0.3	0.8	0.1	0.1	0.4
WE 17x17	BPAA/HFRA	0.5	0.6	0.2	0.7	--	--	--	--
	GTPD/NSA	0.1	0.1	0.1	0.1	--	--	--	--
	RCC	2.9	3.3	1.4	4.3	--	--	--	--
B&W 17x17	BPAA/HFRA	0.1	0.1	0.1	0.1	--	--	--	--
	GTPD/NSA	0.1	0.1	0.1	0.1	--	--	--	--
	RCC	0.2	0.2	0.1	0.2	--	--	--	--

Note: Additional SNF assembly cooling time to be added to the minimum SNF assembly cool time based on SNF assembly initial enrichment and SNF assembly average burnup listed in Tables B2-15 through B2-22 and B2-25 through B2-43.

[1] 0.4 years for RCC in the PMTC (reduced storage location heat load). For all other cask types, 0.3 years for RCC with 5-year minimum cool time or 0.2 years for RCC with 10-year minimum cool time.

Table B2-6 Allowed BPAA/NSA Burnup and Cool Time Combinations

Maximum Burnup (GWd/MTU)	Minimum Cool Time (yrs)				
	WE 14×14	WE 15×15	B&W 15×15	WE 17×17	B&W 17×17
10	0.5	0.5	0.5	0.5	0.5
15	0.5	0.5	0.5	0.5	0.5
20	0.5	1.0	2.0	2.0	0.5
25	1.0	2.5	3.5	3.5	1.0
30	2.5	4.0	5.0	5.0	2.5
32.5	3.0	4.5	6.0	6.0	3.0
35	3.5	5.0	6.0	6.0	3.5
37.5	4.0	6.0	7.0	7.0	4.0
40	4.5	6.0	7.0	7.0	4.5
45	5.0	7.0	8.0	8.0	6.0
50	6.0	8.0	9.0	9.0	7.0
55	7.0	8.0	10.0	9.0	7.0
60	7.0	9.0	10.0	10.0	8.0
65	8.0	10.0	12.0	12.0	8.0
70	8.0	10.0	12.0	12.0	9.0
Max ^{60}Co Activity (Ci)	718	733	19	637	26

Note: Specified minimum cool times for BPRAs are independent of the required minimum cool times for the fuel assembly containing the BPRA.

Table B2-7 Allowed GTPD/NSA Burnup and Cool Time Combinations

Maximum Burnup (GWd/MTU)	Minimum Cool Time (yrs)				
	WE 14×14	WE 15×15	B&W 15×15	WE 17×17	B&W 17×17
45	2.0	3.5	7.0	5.0	6.0
90	6.0	7.0	10.0	9.0	10.0
135	7.0	9.0	12.0	10.0	12.0
180	8.0	9.0	14.0	12.0	12.0
^{60}Co Activity (Ci)	63.5	64.1	56.9	64.0	63.6

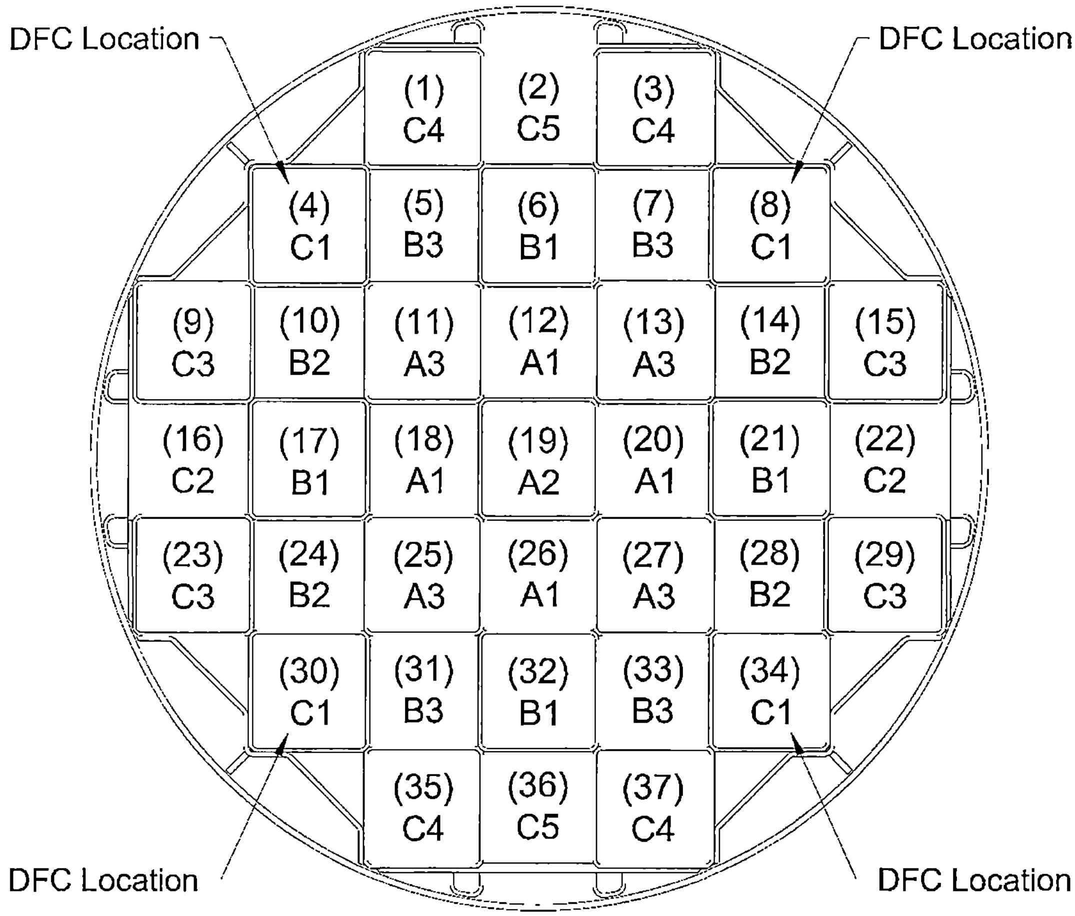
Note: Specified minimum cool times for thimble plugs are independent of the required minimum cool times for the fuel assembly containing the thimble plug.

Table B2-8 PWR Minimum Cool Time Summary Table

Fuel Assembly Heat Load (W) Per Storage Location	Load Pattern	Applicable Fuel Assembly Load Table: Assembly Avg. Burnup ≤ 45 GWd/MTU	Applicable Fuel Assembly Load Table: Assembly Avg. Burnup > 45 GWd/MTU	Added Cool Time when Loading Nonfuel Hardware
400	J, K	Note 1	Note 1	Note 1
513 (W14×14)	C	Table B2-26	Table B2-30	Table B2-5
513 (CE16×16)	C	Table B2-34	Table B2-38	Table B2-5
600	J, K	Note 1	Note 1	Note 1
700	K	Note 1	Note 1	Note 1
800	B	Table B2-13, Table B2-21	Table B2-22	Table B2-5
800	J, K	Note 1	Note 1	Note 1
811	D	Table B2-42, Table B2-43	Table B2-43	Table B2-5
830 (W14×14)	C	Table B2-29	Table B2-33	Table B2-5
830 (W14×14)	C	Table B2-37	Table B2-41	Table B2-5
922	B	Table B2-13, Table B2-19	Table B2-16, Table B2-20	Table B2-5
959	A	Table B2-13, Table B2-15	Table B2-16	Table B2-5
959 (W14×14)	A	Table B2-25	Table B2-16	Table B2-5
1200	B	Table B2-13, Table B2-17	Table B2-18	Table B2-5
1250	J	Note 1	Note 1	Note 1
1300 (W14×14)	C	Table B2-27	Table B2-31	Table B2-5
1300 (CE16×16)	C	Table B2-35	Table B2-39	Table B2-5
1380	I	Note 1	Note 1	Note 1
1800 (W14×14)	C	Table B2-28	Table B2-32	Table B2-5
1800 (CE16×16)	C	Table B2-36	Table B2-40	Table B2-5
1900	K	Note 1	Note 1	Note 1
2500	K	Note 1	Note 1	Note 1
3,250	J	Note 1	Note 1	Note 1

Note 1: Fuel assembly and non-fuel hardware heat load to be evaluated based on discharged, or bounding, depletion and fuel assembly characteristics and total must be less than or equal to listed limit.

Figure B2-1 Schematic of PWR 37-Assembly Basket



DFC designated locations may contain a loaded DFC or a PWR UNDAMAGED SNF ASSEMBLY. Figure applies to PWR Basket and PWR DF Basket.

"A1", "A2", "A3" may be referred to as storage location "A" when no differentiation of heat load is required between the various locations. Similarly, for group B and C locations.

Figure B2-2 [DELETED]

Figure B2-3 [DELETED]

Table B2-9 TSC with BWR Fuel Limits

I. TSC with BWR Basket Assembly and BWR DF Basket Assembly

A. Allowable Contents

1. Uranium BWR UNDAMAGED FUEL assemblies and DAMAGED FUEL (BWR DAMAGED SNF ASSEMBLIES or BWR FUEL DEBRIS) that meet the following specifications:

a. Cladding Type:	Zirconium-based alloy.
b. Physical Characteristics	The physical characteristics of the different BWR SNF ASSEMBLIES are defined in Table B2-11.
c. Maximum Enrichment	Fuel type specific enrichment limits for the BWR fuel basket configurations are defined in Table B2-12 through B2-12f as a function of neutron absorber areal density, basket type (undamaged or damaged), number of assemblies loaded, and/or preferential loading. Underload locations are defined in Table B2-12g in relation to Figures B2-4 and B2-5.
d. Decay Heat per SNF Assembly:	Load pattern dependent allowed heat loads for each fuel storage location illustrated in Figure B2-4, undamaged 89-Assembly basket, and Table B2-5, 81-Asssembly damaged basket are shown in Table B2-10a and B2-10b, respectively. Links to correlate allowed heat load to load tables are summarized in Table B2-10c and Table B2-10d. As applicable, load tables contain minimum SNF cool time as a function of maximum SNF assembly average burnup and minimum assembly average enrichment.
e. Nominal Fresh Fuel Design SNF Assembly Length (in.):	≤ 176.2
f. Nominal Fresh Fuel Design SNF Assembly Width (in.):	≤ 5.52
g. SNF Assembly Weight (lb):	≤ 704, including channels and spacers for non DF storage location and ≤ 804 for DF locations, including channels, the DFC and spacers.
h. Non-DF Basket - Total Canister Contents Weight (lbs.)	≤ 62,656, including SNF Assemblies, NONFUEL HARDWARE and fuel spacers
i. DF Basket -Total Canister Contents Weight (lbs.)	≤ 58,224, including SNF Assemblies, NONFUEL HARDWARE, DFCs and fuel spacers
j. Total Canister Weight including Contents (lbs.)	≤ 104,500 (nominal TSC weight plus maximum contents)

(continued)

Table B2-9 TSC with BWR Fuel Limits (continued)

B. Quantity per TSC: Up to a total of 89 BWR UNDAMAGED SNF ASSEMBLIES in the undamaged (89-Assembly) basket or up to a total of 81 BWR UNDAMAGED SNF ASSEMBLIES in the damaged fuel (81-Assembly). The damaged fuel basket may be loaded with up to twelve (12) DFCs containing BWR UNDAMAGED SNF ASSEMBLIES, BWR DAMAGED SNF ASSEMBLIES, and/or BWR FUEL DEBRIS. DFCs may only be loaded in the DFC basket and are limited to locations No. 4, 8, 9, 15, 16, 24, 58, 66, 67, 73, 74, and 78, as shown on Figure B2-5.

C. The contents of a DFC must be less than, or equivalent to, one BWR UNDAMAGED SNF ASSEMBLY.

D. BWR fuel assemblies may be unchanneled, or channeled with zirconium-based alloy channels.

E. BWR fuel assemblies with stainless steel channels are not authorized.

F. SNF Assembly lattices possessing less than the nominal number of undamaged fuel rods (see Table B2-11) must contain solid filler rods that displace a volume equal to, or greater than, that of the fuel rod that the filler rod replaces.

G. Spacers may be used in a TSC to axially position BWR SNF assemblies to facilitate handling.

H. Unirradiated (i.e., not inserted in-core) fuel assemblies are not authorized for loading. Unenriched axial blankets are permitted, provided that the nominal length of the blanket is not greater than six (6) inches.

I. Assemblies identified as subject to CILC phenomena are authorized for loading without use of DFC provided the limits in Table B2-12h are met and the fuel assembly is channeled. Should the channel not be present a DFC is required and generic BWR DF limits apply.

Table B2-10 BWR SNF Assembly Characteristics

Characteristic	Fuel Class			
	7×7	8×8	9×9	10×10
Number of Fuel Rods	48/49	59/60/61/ 62/63/64	72/74[a]/76/ 79/80	91[a]/92[a]/ 96[a]/100
Max Assembly Average Burnup (MWd/MTU)	60,000	60,000	60,000	60,000
Min Average Enrichment (wt % ^{235}U)	0.7	0.7	0.7	0.7

- Each BWR fuel assembly may include a zirconium-based alloy channel.
- Water rods may occupy more than one fuel lattice location. Fuel assembly to contain nominal number of water rods for the specific assembly design.
- Spacers may be used to axially position fuel assemblies to facilitate handling.

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[a] Assemblies may contain partial-length fuel rods.

Table B2-10a BWR 89-Assembly Basket Fuel Loading Patterns

	Loading Pattern and Maximum Heat Load per Storage Location (W) [1]			
Storage Location	**A**	**B**	**C**	**D**
A	379	533[2]	200	200
B			300	300
C1			1100	1000
C2			950	900
C3			600	600
C4			350	450
D1			450	450
D2				
Max Heat Load per Cask	33,000	39,500	42,000	42,000
Pattern Use Limitations	None	3" Liner and Heat Shield CC / LMTC	3" Liner and Heat Shield CC / LMTC	3" Liner and Heat Shield CC / LMTC

Notes:

- Locations per Figure B2-4.

(1) Loading patterns are referred to in the FSAR as follows:

A – Uniform Loading Pattern
B – Loading Pattern A or 89B-A
C – Loading Pattern B or 89B-B
D – Loading Pattern C or 89B-C

(2) Loading Pattern B with heat load in any storage location above 444W (uniform load) requires the following additional limits:

a. Assemblies with highest loads must be stored in Zone C.
b. Assemblies with lowest heat loads must be stored in Zone A and B, with the lowest overall heat load in the center of Zone A and progressively increasing heat loads in the surrounding rings.
c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (2)a and (2)b

Table B2-10b BWR 81-Assembly Basket Fuel Loading Patterns

	Loading Pattern and Maximum Heat Load per Storage Location (W) [3]		
Storage Location	**A**	**B**	**C**
A	585[4]	300	300
B		400	400
C1		1100	1000
C2		900	600
C3		500	600
C4		475	525
D1		425	525
D2		475	525
D3		500	600
Max Heat Load per Cask	39,500	41,000	41,000
Pattern Use Limitations	3" Liner and Heat Shield CC / LMTC	3" Liner and Heat Shield CC / LMTC	3" Liner and Heat Shield CC / LMTC

Notes:

- Locations per Figure B2-5.

(3) Loading patterns are referred to in the FSAR as follows:

A – Loading Pattern A or 81B-A
B – Loading Pattern B or 81B-B
C – Loading Pattern C or 81B-C

(4) Loading Pattern A with heat load in any storage location above 488W (uniform load) requires the following additional limits:

a. Assemblies with highest loads must be stored in Zone C.
b. Assemblies with lowest heat loads must be stored in Zone A and B, with the lowest overall heat load in the center of Zone A and progressively increasing heat loads in the surrounding rings.
c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (4)a. and (4)b

Table B2-10c BWR 89-Assembly Basket Minimum Cool Time Summary Table

Fuel Assembly Heat Load (W) Per Storage Location	Load Pattern	Applicable Fuel Assembly Load Table	
		Assembly Avg. Burnup ≤ 45 GWd/MTU	Assembly Avg. Burnup > 45 GWd/MTU
200	C, D	Note 1	Note 1
300	C, D	Note 1	Note 1
350	C	Note 1	Note 1
379	A	Table B2-14, B2-23	Table B2-24
450	C, D	Note 1	Note 1
533	B	Note 1	Note 1
600	C, D	Note 1	Note 1
900	D	Note 1	Note 1
950	C	Note 1	Note 1
1000	D	Note 1	Note 1
1100	C	Note 1	Note 1

Note 1: Fuel assembly heat load to be evaluated based on discharged, or bounding, depletion and fuel assembly characteristics and must be less than or equal to listed limit.

Table B2-10d BWR 81-Assembly Basket Minimum Cool Time Summary Table

Fuel Assembly Heat Load (W) Per Storage Location	Load Pattern	Applicable Fuel Assembly Load Table	
		Assembly Avg. Burnup ≤ 45 GWd/MTU	Assembly Avg. Burnup > 45 GWd/MTU
300	B, C	Note 1	Note 1
400	B., C	Note 1	Note 1
425	B	Note 1	Note 1
475	B	Note 1	Note 1
500	B	Note 1	Note 1
525	C	Note 1	Note 1
585	A	Note 1	Note 1
600	C	Note 1	Note 1
900	B	Note 1	Note 1
1000	C	Note 1	Note 1
1100	B	Note 1	Note 1

Note 1: Fuel assembly heat load to be evaluated based on discharged, or bounding, depletion and fuel assembly characteristics and must be less than or equal to listed limit.

Table B2-11 BWR SNF Assembly Loading Criteria

			Geometry [3,4]					
Assembly Type	Number of Fuel Rods	Number of Partial Length Rods [1]	Max Pitch (inch)	Min Clad OD (inch)	Min Clad Thick. (inch)	Max Pellet OD (inch)	Max Active Length (inch)	Max Loading (MTU)
B7_48A	48	N/A	0.7380	0.5700	0.03600	0.4900	144.0	0.1981
B7_49A	49	N/A	0.7380	0.5630	0.03200	0.4880	146.0	0.2034
B7_49B	49	N/A	0.7380	0.5630	0.03200	0.4910	150.0	0.2115
B8_59A	59	N/A	0.6400	0.4930	0.03400	0.4160	150.0	0.1828
B8_60A	60	N/A	0.6417	0.4840	0.03150	0.4110	150.0	0.1815
B8_60B	60	N/A	0.6400	0.4830	0.03000	0.4140	150.0	0.1841
B8_61B	61	N/A	0.6400	0.4830	0.03000	0.4140	150.0	0.1872
B8_62A	62	N/A	0.6417	0.4830	0.02900	0.4160	150.0	0.1921
B8_63A	63	N/A	0.6420	0.4840	0.02725	0.4195	150.0	0.1985
B8_64A	64	N/A	0.6420	0.4840	0.02725	0.4195	150.0	0.2017
B8_64B[5]	64	N/A	0.6090	0.4576	0.02900	0.3913	150.0	0.1755
B9_72A	72	N/A	0.5720	0.4330	0.02600	0.3740	150.0	0.1803
B9_74A	74[2]	8	0.5720	0.4240	0.02390	0.3760	150.0	0.1873
B9_76A	76	N/A	0.5720	0.4170	0.02090	0.3750	150.0	0.1914
B9_79A	79	N/A	0.5720	0.4240	0.02390	0.3760	150.0	0.2000
B9_80A	80	N/A	0.5720	0.4230	0.02950	0.3565	150.0	0.1821
B10_91A	91[2]	8	0.5100	0.3957	0.02385	0.3420	150.0	0.1906
B10_92A	92[2]	14	0.5100	0.4040	0.02600	0.3455	150.0	0.1966
B10_96A[5]	96[2]	12	0.4880	0.3780	0.02430	0.3224	150.0	0.1787
B10_100A[5]	100	N/A	0.4880	0.3780	0.02430	0.3224	150.0	0.1861

1 Location of the partial length rods is illustrated in Figure B2-6.
2 Assemblies may contain partial-length fuel rods.
3 Assembly characteristics represent cold, unirradiated, nominal configurations.
4 Maximum channel thickness allowed is 120 mils (nominal).
5 Composed of four subchannel clusters.

Table B2-12 BWR 89-Assembly Basket SNF Assembly Loading Criteria – Enrichment Limits

	Max. Initial Enrichment[a] (wt % ^{235}U)						
	Absorber[b] 0.027 ^{10}B g/cm^2						
	89-Assy	87-Assy	86-Assy	85-Assy	84-Assy	83-Assy	82-Assy
B7_48A	4.0%	4.5%	4.7%	5.0%	5.0%	5.0%	5.0%
B7_49A	3.8%	4.3%	4.5%	4.8%	5.0%	5.0%	5.0%
B7_49B	3.8%	4.3%	4.5%	4.8%	5.0%	5.0%	5.0%
B8_59A	3.9%	4.4%	4.6%	4.8%	5.0%	5.0%	5.0%
B8_60A	3.8%	4.3%	4.4%	4.7%	4.9%	5.0%	5.0%
B8_60B	3.8%	4.3%	4.4%	4.7%	4.9%	5.0%	5.0%
B8_61B	3.8%	4.3%	4.4%	4.7%	4.9%	4.9%	5.0%
B8_62A	3.8%	4.2%	4.4%	4.6%	4.8%	4.9%	5.0%
B8_63A	3.8%	4.2%	4.4%	4.6%	4.8%	4.9%	5.0%
B8_64A	3.8%	4.3%	4.4%	4.7%	4.9%	4.9%	5.0%
B8_64B	3.6%	4.0%	4.2%	4.4%	4.5%	4.6%	4.9%
B9_72A	3.8%	4.2%	4.4%	4.6%	4.8%	4.8%	5.0%
B9_74A	3.7%c	4.1%	4.2%	4.4%	4.6%	4.6%	4.8%
B9_76A	3.5%	3.9%	4.1%	4.3%	4.5%	4.5%	4.8%
B9_79A	3.7%	4.1%	4.3%	4.5%	4.7%	4.7%	5.0%
B9_80A	3.8%	4.3%	4.4%	4.7%	4.9%	4.9%	5.0%
B10_91A	3.7%	4.2%	4.3%	4.6%	4.8%	4.8%	5.0%
B10_92A	3.8%	4.2%	4.3%	4.6%	4.7%	4.8%	5.0%
B10_96A	3.7%	4.1%	4.2%	4.4%	4.6%	4.6%	4.8%
B10_100A	3.6%	4.1%	4.2%	4.4%	4.6%	4.7%	4.9%

[a] Maximum planar average.

[b] Borated aluminum neutron absorber sheet effective areal ^{10}B density.

[c] 3.85% in the 88-assembly configuration.

Table B2-12a BWR 89-Assembly Basket SNF Assembly Loading Criteria – Reduced Neutron Absorber Content - Enrichment Limits

	Max. Initial Enrichment[a] (wt % ^{235}U)			
	Absorber 0.0225 ^{10}B g/cm^2		Absorber 0.02 ^{10}B g/cm^2	
	89-Assy	84-Assy	89-Assy	84-Assy
B7_48A	3.7%	4.5%	3.6%	4.4%
B7_49A	3.6%	4.4%	3.5%	4.3%
B7_49B	3.6%	4.4%	3.5%	4.2%
B8_59A	3.7%	4.5%	3.6%	4.3%
B8_60A	3.7%	4.4%	3.5%	4.2%
B8_60B	3.6%	4.3%	3.5%	4.2%
B8_61B	3.6%	4.3%	3.5%	4.2%
B8_62A	3.6%	4.3%	3.5%	4.1%
B8_63A	3.6%	4.3%	3.4%	4.2%
B8_64A	3.6%	4.3%	3.5%	4.2%
B8_64B	3.4%	4.1%	3.3%	4.0%
B9_72A	3.6%	4.3%	3.4%	4.1%
B9_74A	3.4%	4.1%	3.4%	4.0%
B9_76A	3.4%	4.0%	3.3%	3.9%
B9_79A	3.4%	4.2%	3.3%	4.0%
B9_80A	3.6%	4.3%	3.5%	4.2%
B10_91A	3.6%	4.3%	3.5%	4.1%
B10_92A	3.6%	4.3%	3.5%	4.1%
B10_96A	3.5%	4.1%	3.4%	4.0%
B10_100A	3.5%	4.1%	3.4%	4.0%

[a] Maximum planar average.

Table B2-12b BWR 89-Assembly Basket SNF Assembly Loading Criteria – 89-Assembly Load - Absorber 0.027 ^{10}B g/cm^2 – Preferential Loading Enrichment Limits

Outer Assembly[a] Enrichment Limit[b] (wt % ^{235}U)	4.6%	4.7%	4.8%
Assembly	Inner Assembly[c] Enrichment Limit[b] (wt % ^{235}U)		
B9_72A	3.6	3.5	3.5
B9_74A	3.4	3.3	3.2
B9_76A	3.2	3.2	3.1
B9_79A	3.4	3.4	3.3
B9_80A	3.7	3.6	3.6
B10_91A	3.5	3.5	3.5
B10_92A	3.5	3.5	3.5
B10_96A	3.4	3.4	3.3
B10_100A	3.4	3.3	3.2

[a] Locations C1, C2, C4, D1, D2, 12, 18, 72, 78 in Figure B2-4.

[b] Maximum planar average.

[c] Locations A, B, C3 (except for Locations 12, 18, 72, 78) in Figure B2-4.

Table B2-12c BWR 89-Assembly Basket SNF Assembly Loading Criteria – Absorber 0.027 ^{10}B g/cm^2 – Preferential Load/Underload Combination Enrichment Limits

# Assy Loaded / Pattern ID	87-Assembly Under Load			86-Assembly Under Load			85-Assembly Under Load		
Outer Assembly[a] Enrichment Limit[b] (wt % ^{235}U)	4.6%	4.7%	4.8%	4.6%	4.7%	4.8%	4.6%	4.7%	4.8%
	Inner Assembly[c] Enrichment Limit[b] (wt % ^{235}U)								
B9_72A	4.0%	3.9%	3.8%	4.2%	4.2%	4.1%	4.6%	4.5%	4.4%
B9_74A	3.7%	3.6%	3.5%	3.9%	3.9%	3.8%	4.3%	4.2%	4.1%
B9_76A	3.5%	3.4%	3.3%	3.8%	3.7%	3.6%	4.1%	4.0%	3.9%
B9_79A	3.8%	3.7%	3.6%	4.1%	4.0%	4.0%	4.4%	4.4%	4.3%
B9_80A	4.1%	4.1%	4.0%	4.4%	4.3%	4.2%	4.8%	4.7%	4.7%
B10_91A	4.0%	3.9%	3.8%	4.2%	4.1%	4.1%	4.6%	4.5%	4.4%
B10_92A	3.9%	3.9%	3.8%	4.2%	4.1%	4.1%	4.6%	4.5%	4.4%
B10_96A	3.7%	3.7%	3.6%	4.0%	3.9%	3.8%	4.3%	4.2%	4.1%
B10_100A	3.7%	3.7%	3.6%	4.0%	3.9%	3.8%	4.4%	4.3%	4.2%

[a] Locations C1, C2, C4, D1, D2, 12, 18, 72, 78 in Figure B2-4.

[b] Maximum planar average.

[c] Locations A, B, C3 (except for Locations 12, 18, 72, 78) in Figure B2-4.

Table B2-12d BWR 81-Assembly Basket SNF Assembly Loading Criteria – Enrichment Limits

	Max. Initial Enrichment[a] (wt % ^{235}U)						
Max # Assy in Basket	81-Assy	80-Assy	79-Assy	78-Assy	77-Assy	76-Assy	75-Assy
B7_48A	4.0%	4.3%	4.5%	4.8%	5.0%	5.0%	5.0%
B7_49A	3.9%	4.2%	4.4%	4.6%	4.9%	5.0%	5.0%
B7_49B	3.9%	4.2%	4.4%	4.6%	4.9%	5.0%	5.0%
B8_59A	4.0%	4.3%	4.5%	4.7%	5.0%	5.0%	5.0%
B8_60A	3.9%	4.2%	4.4%	4.6%	4.9%	5.0%	5.0%
B8_60B	3.9%	4.2%	4.4%	4.6%	4.9%	5.0%	5.0%
B8_61B	3.9%	4.2%	4.4%	4.5%	4.9%	5.0%	5.0%
B8_62A	3.8%	4.1%	4.3%	4.5%	4.8%	5.0%	5.0%
B8_63A	3.8%	4.1%	4.3%	4.5%	4.8%	5.0%	5.0%
B8_64A	3.9%	4.1%	4.3%	4.5%	4.8%	5.0%	5.0%
B8_64B	3.7%	4.0%	4.1%	4.3%	4.6%	4.7%	4.8%
B9_72A	3.8%	4.1%	4.3%	4.5%	4.8%	5.0%	5.0%
B9_74A	3.7%	4.0%	4.1%	4.3%	4.6%	4.8%	4.9%
B9_76A	3.6%	3.9%	4.0%	4.2%	4.5%	4.7%	4.8%
B9_79A	3.7%	4.0%	4.1%	4.3%	4.7%	4.8%	4.9%
B9_80A	3.9%	4.2%	4.4%	4.5%	4.8%	5.0%	5.0%
B10_91A	3.8%	4.1%	4.3%	4.5%	4.8%	4.9%	5.0%
B10_92A	3.8%	4.1%	4.3%	4.5%	4.8%	4.9%	5.0%
B10_96A	3.7%	4.0%	4.2%	4.3%	4.6%	4.8%	4.9%
B10_100A	3.7%	4.0%	4.1%	4.3%	4.6%	4.8%	4.9%

[a] Maximum planar average.

Table B2-12e BWR 81-Assembly Basket SNF Assembly Loading Criteria – 81-Assembly Load - Preferential Loading Enrichment Limits

Outer Assembly[a] Enrichment Limit[b] (wt % ^{235}U)	4.6%	4.7%	4.8%
Assembly	**Inner Assembly[c] Enrichment Limit (wt % ^{235}U)**		
B9_72A	3.7%	3.7%	3.6%
B9_74A	3.5%	3.5%	3.4%
B9_76A	3.4%	3.3%	3.3%
B9_79A	3.5%	3.4%	3.4%
B9_80A	3.7%	3.7%	3.6%
B10_91A	3.7%	3.7%	3.6%
B10_92A	3.7%	3.6%	3.6%
B10_96A	3.4%	3.4%	3.3%
B10_100A	3.5%	3.4%	3.4%

[a] Locations C, D, F, G, H, I in Figure B2-5.

[b] Maximum planar average.

[c] Locations A, B, E in Figure B2-4.

Table B2-12f BWR 81-Assembly Basket SNF Assembly Loading Criteria - Preferential Load/Underload Combination Enrichment Limits

# Assy Loaded / Pattern ID	80-Assembly Under Load			79-Assembly Under Load			78-Assembly Under Load		
Outer Assembly[a] Enrichment Limit[b] (wt % ^{235}U)	4.6%	4.7%	4.8%	4.6%	4.7%	4.8%	4.6%	4.7%	4.8%
	Inner Assembly[c] Enrichment Limit[b] (wt % ^{235}U)								
B9_72A	4.0%	3.9%	3.9%	4.2%	4.1%	4.1%	4.5%	4.4%	4.3%
B9_74A	3.7%	3.7%	3.7%	4.0%	3.9%	3.8%	4.2%	4.1%	4.1%
B9_76A	3.6%	3.5%	3.5%	3.8%	3.7%	3.6%	4.0%	3.9%	3.9%
B9_79A	3.7%	3.7%	3.6%	3.9%	3.9%	3.8%	4.2%	4.1%	4.1%
B9_80A	4.0%	3.9%	3.9%	4.3%	4.2%	4.1%	4.5%	4.5%	4.4%
B10_91A	3.9%	3.9%	3.8%	4.2%	4.1%	4.1%	4.4%	4.4%	4.3%
B10_92A	3.9%	3.9%	3.8%	4.1%	4.1%	4.1%	4.4%	4.4%	4.3%
B10_96A	3.7%	3.6%	3.6%	3.9%	3.8%	3.7%	4.2%	4.1%	4.0%
B10_100A	3.7%	3.6%	3.6%	3.9%	3.8%	3.8%	4.2%	4.1%	4.0%

[a] Locations C, D, F, G, H, I in Figure B2-5.

[b] Maximum planar average.

[c] Locations A, B, E in Figure B2-5.

Table B2-12g BWR Load Pattern Identifier Underload/Empty Location Key

Basket	Load Pattern Identifier	Evaluation Type[a]	Underload/Empty Basket Locations[b]
89	88	Uniform	45
	87	Uniform/Preferential	33, 57
	86	Uniform/Preferential	25, 43, 67
	85	Uniform/Preferential	25, 32, 58, 65
	84	Uniform	25, 32, 45, 58, 65
	83	Uniform	15, 31, 37, 45, 64, 76
	82	Uniform	14, 26, 31, 45, 59, 64, 76
81-DF	80	Uniform/Preferential	41
	79	Uniform/Preferential	29, 53
	78	Uniform/Preferential	28, 31, 62
	77	Uniform	20, 39, 43, 62
	76	Uniform	21, 28, 41, 54, 61
	75	Uniform	21, 28, 41, 50, 54, 62

[a] Analysis section that this load pattern is identified with.
[b] Locations identified in Figure B2-4 (BWR 89-Assembly) and Figure B2-5 (BWR-DF 81-Assembly).

Table B2-12h BWR CILC Fuel Assembly Enrichment Limits

Basket Configuration	89 Assembly	89-Assembly	81-Assembly DF
Load Definition	Full Load - 89 Assembly	Underload - 87 Assembly	Full Load - 81 Assembly
Assembly Type	Enrichment (wt% ^{235}U) Maximum Planar Average		
B8_59A	3.3%	3.6%	3.4%
B8_60A	3.3%	3.6%	3.4%
B8_60B	3.3%	3.6%	3.3%
B8_61B	3.3%	3.6%	3.3%
B8_62A	3.2%	3.5%	3.3%
B8_63A	3.2%	3.5%	3.3%
B8_64A	3.2%	3.5%	3.3%
B8_64B	3.2%	3.5%	3.3%

Figure B2-4 Schematic of BWR 89-Assembly Basket

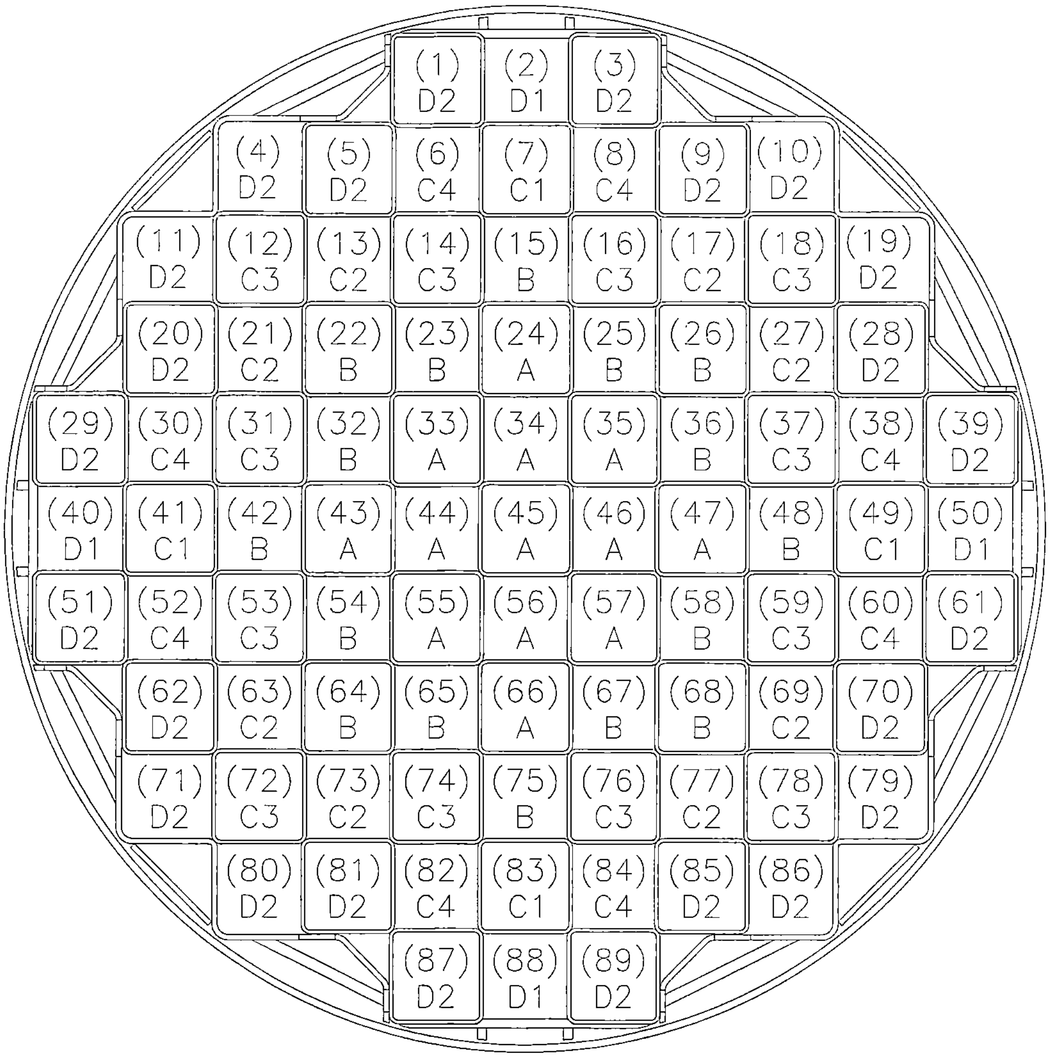


Figure B2-5 Schematic of BWR 81-Assembly Basket

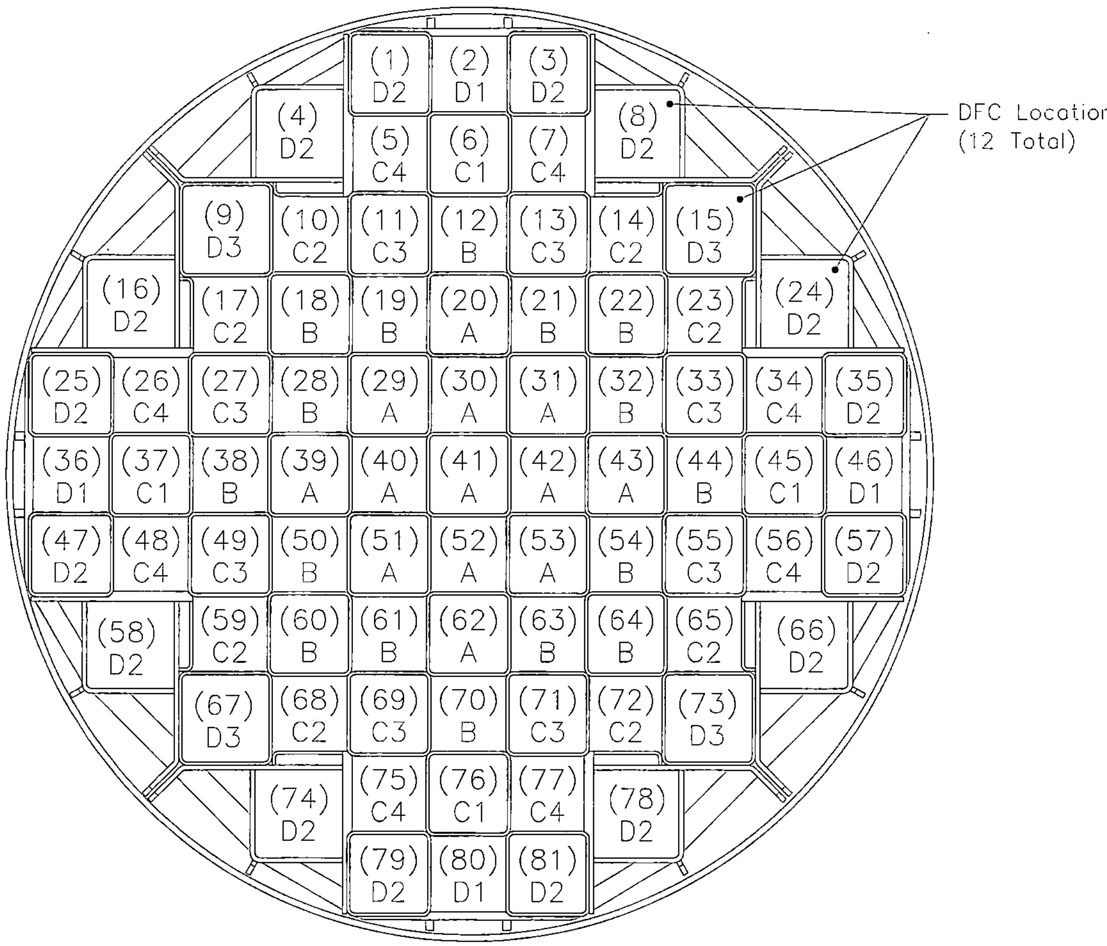
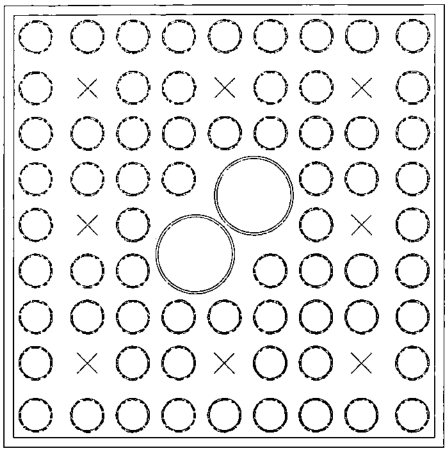


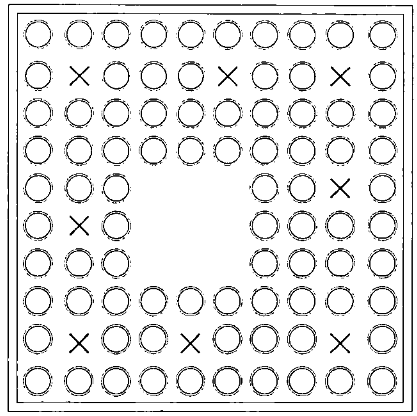
Figure B2-6 BWR Partial Length Fuel Rod Location Sketches



○ = Fuel Rod Location

× = Par ial Rod Location

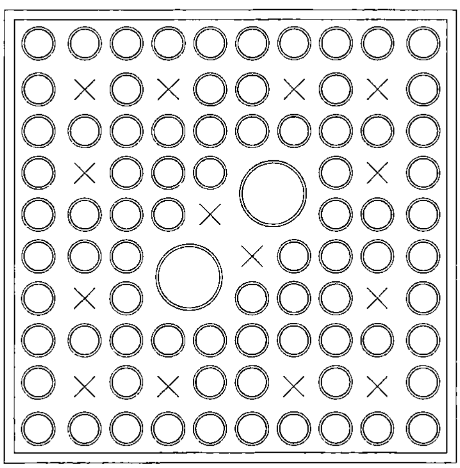
B9_74A 8 Partial Length Rods



○ = Fuel Rod Location

× = Partial Rod Location

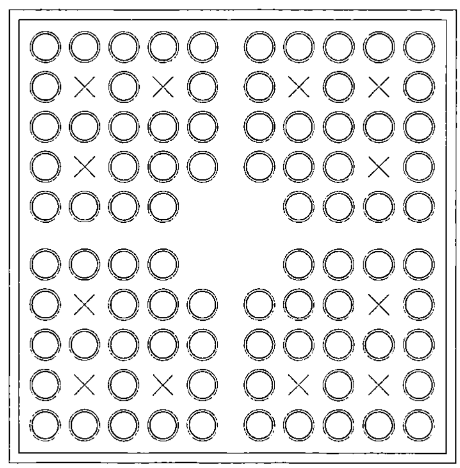
B10_91A 8 Partial Length Rods



○ = Fuel Rod Location

× = Partial Rod Location

B10_92A 14 Partial Length Rods



○ = Fuel Rod Location

× = Partial Rod Location

B10_96A 12 Partial Length Rods

Table B2-13 PWR Loading Table – Low SNF Assembly Average Burnup Enrichment Limits

Max. Assembly Avg. Burnup (MWd/MTU)	Min. Assembly Avg. Initial Enrichment (wt% ^{235}U)	Minimum Cool Time (yrs)			
Heat Load per Assy	--	959 W	800 W	922 W	1,200 W
10,000	1.3	4.0	4.0	4.0	4.0
15,000	1.5	4.0	4.0	4.0	4.0
20,000	1.7	4.0	4.0	4.0	4.0
25,000	1.9	4.0	4.3	4.0	4.0
30,000	2.1	4.4	5.2	4.5	4.0

Table B2-14 BWR Loading Table – Low SNF Assembly Average Burnup Enrichment Limits

Max. Assembly Avg. Burnup (MWd/MTU)	Min. Assembly Avg. Initial Enrichment (wt% ^{235}U)	Minimum Cool Time (yrs)
5,000	0.7	4.0
10,000	1.3	4.0
15,000	1.5	4.0
20,000	1.7	4.0
25,000	1.9	4.0
30,000	2.1	4.3

Table B2-15 Loading Table for PWR Fuel – 959 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	30 < Assembly Average Burnup ≤ 32.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	4.1	4.1	4.6	4.7	4.4	4.7	4.7
2.3 ≤ E < 2.5	4.0	4.1	4.5	4.7	4.4	4.6	4.6
2.5 ≤ E < 2.7	4.0	4.0	4.5	4.6	4.3	4.6	4.6
2.7 ≤ E < 2.9	4.0	4.0	4.5	4.5	4.3	4.5	4.5
2.9 ≤ E < 3.1	4.0	4.0	4.4	4.5	4.2	4.5	4.5
3.1 ≤ E < 3.3	4.0	4.0	4.4	4.5	4.2	4.5	4.5
3.3 ≤ E < 3.5	4.0	4.0	4.3	4.4	4.2	4.4	4.4
3.5 ≤ E < 3.7	4.0	4.0	4.3	4.4	4.1	4.4	4.4
3.7 ≤ E < 3.9	4.0	4.0	4.3	4.4	4.1	4.4	4.4
3.9 ≤ E < 4.1	4.0	4.0	4.2	4.3	4.0	4.3	4.3
4.1 ≤ E < 4.3	4.0	4.0	4.2	4.3	4.0	4.3	4.3
4.3 ≤ E < 4.5	4.0	4.0	4.2	4.3	4.0	4.3	4.3
4.5 ≤ E < 4.7	4.0	4.0	4.1	4.2	4.0	4.2	4.2
4.7 ≤ E < 4.9	4.0	4.0	4.1	4.2	4.0	4.2	4.2
E ≥ 4.9	4.0	4.0	4.1	4.2	4.0	4.2	4.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	32.5 < Assembly Average Burnup ≤ 35 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.3	4.4	5.0	5.1	4.7	5.0	5.0
2.5 ≤ E < 2.7	4.3	4.4	4.9	5.0	4.7	5.0	5.0
2.7 ≤ E < 2.9	4.2	4.3	4.8	5.0	4.6	4.9	4.9
2.9 ≤ E < 3.1	4.2	4.3	4.8	4.9	4.6	4.9	4.9
3.1 ≤ E < 3.3	4.1	4.2	4.7	4.9	4.5	4.8	4.8
3.3 ≤ E < 3.5	4.1	4.2	4.7	4.8	4.5	4.8	4.8
3.5 ≤ E < 3.7	4.1	4.1	4.6	4.8	4.4	4.7	4.7
3.7 ≤ E < 3.9	4.0	4.1	4.6	4.7	4.4	4.7	4.7
3.9 ≤ E < 4.1	4.0	4.1	4.6	4.7	4.4	4.7	4.7
4.1 ≤ E < 4.3	4.0	4.0	4.5	4.7	4.3	4.6	4.6
4.3 ≤ E < 4.5	4.0	4.0	4.5	4.6	4.3	4.6	4.6
4.5 ≤ E < 4.7	4.0	4.0	4.5	4.6	4.3	4.6	4.6
4.7 ≤ E < 4.9	4.0	4.0	4.4	4.6	4.3	4.5	4.5
E ≥ 4.9	4.0	4.0	4.4	4.5	4.2	4.5	4.5

Table B2-15 Loading Table for PWR Fuel – 959 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	35 < Assembly Average Burnup ≤ 37.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.7	4.8	5.5	5.7	5.2	5.6	5.6
2.5 ≤ E < 2.7	4.6	4.7	5.4	5.6	5.1	5.5	5.5
2.7 ≤ E < 2.9	4.6	4.7	5.3	5.5	5.0	5.4	5.4
2.9 ≤ E < 3.1	4.5	4.6	5.3	5.4	5.0	5.4	5.4
3.1 ≤ E < 3.3	4.5	4.5	5.2	5.4	4.9	5.3	5.3
3.3 ≤ E < 3.5	4.4	4.5	5.1	5.3	4.9	5.2	5.2
3.5 ≤ E < 3.7	4.4	4.5	5.0	5.2	4.8	5.2	5.2
3.7 ≤ E < 3.9	4.3	4.4	5.0	5.2	4.8	5.1	5.1
3.9 ≤ E < 4.1	4.3	4.4	5.0	5.1	4.7	5.1	5.1
4.1 ≤ E < 4.3	4.3	4.4	4.9	5.1	4.7	5.0	5.0
4.3 ≤ E < 4.5	4.2	4.3	4.9	5.0	4.7	5.0	5.0
4.5 ≤ E < 4.7	4.2	4.3	4.9	5.0	4.6	5.0	5.0
4.7 ≤ E < 4.9	4.2	4.3	4.8	5.0	4.6	4.9	4.9
E ≥ 4.9	4.1	4.2	4.8	4.9	4.5	4.9	4.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	37.5 < Assembly Average Burnup ≤ 40 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.0	5.2	5.9	6.1	5.6	6.0	6.0
2.7 ≤ E < 2.9	5.0	5.1	5.9	6.0	5.5	5.9	5.9
2.9 ≤ E < 3.1	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.1 ≤ E < 3.3	4.9	4.9	5.7	5.9	5.4	5.8	5.8
3.3 ≤ E < 3.5	4.8	4.9	5.7	5.8	5.3	5.7	5.7
3.5 ≤ E < 3.7	4.7	4.8	5.6	5.8	5.2	5.7	5.7
3.7 ≤ E < 3.9	4.7	4.8	5.5	5.7	5.2	5.6	5.6
3.9 ≤ E < 4.1	4.6	4.8	5.5	5.7	5.1	5.6	5.6
4.1 ≤ E < 4.3	4.6	4.7	5.4	5.6	5.1	5.5	5.5
4.3 ≤ E < 4.5	4.5	4.7	5.4	5.6	5.0	5.5	5.5
4.5 ≤ E < 4.7	4.5	4.6	5.3	5.5	5.0	5.4	5.4
4.7 ≤ E < 4.9	4.5	4.6	5.3	5.5	5.0	5.4	5.4
E ≥ 4.9	4.5	4.5	5.2	5.4	4.9	5.4	5.4

Table B2-15 Loading Table for PWR Fuel – 959 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	40 < Assembly Average Burnup ≤ 41 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.3	5.4	6.2	6.4	5.8	6.3	6.3
2.7 ≤ E < 2.9	5.2	5.3	6.1	6.3	5.7	6.2	6.2
2.9 ≤ E < 3.1	5.1	5.2	6.0	6.2	5.7	6.1	6.1
3.1 ≤ E < 3.3	5.0	5.1	5.9	6.1	5.6	6.0	6.0
3.3 ≤ E < 3.5	4.9	5.1	5.9	6.0	5.5	5.9	5.9
3.5 ≤ E < 3.7	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.7 ≤ E < 3.9	4.8	4.9	5.7	5.9	5.4	5.8	5.8
3.9 ≤ E < 4.1	4.8	4.9	5.7	5.9	5.3	5.8	5.8
4.1 ≤ E < 4.3	4.7	4.9	5.6	5.8	5.3	5.7	5.7
4.3 ≤ E < 4.5	4.7	4.8	5.6	5.8	5.2	5.7	5.7
4.5 ≤ E < 4.7	4.7	4.8	5.5	5.7	5.2	5.6	5.6
4.7 ≤ E < 4.9	4.6	4.7	5.5	5.7	5.1	5.6	5.6
E ≥ 4.9	4.6	4.7	5.5	5.6	5.1	5.6	5.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	41 < Assembly Average Burnup ≤ 42 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.5	5.6	6.5	6.7	6.0	6.6	6.6
2.7 ≤ E < 2.9	5.4	5.5	6.4	6.6	5.9	6.5	6.5
2.9 ≤ E < 3.1	5.3	5.4	6.3	6.5	5.9	6.4	6.4
3.1 ≤ E < 3.3	5.2	5.3	6.2	6.4	5.8	6.3	6.3
3.3 ≤ E < 3.5	5.1	5.3	6.1	6.3	5.7	6.2	6.2
3.5 ≤ E < 3.7	5.0	5.2	6.0	6.2	5.7	6.1	6.1
3.7 ≤ E < 3.9	5.0	5.1	5.9	6.2	5.6	6.0	6.0
3.9 ≤ E < 4.1	4.9	5.1	5.9	6.1	5.5	6.0	6.0
4.1 ≤ E < 4.3	4.9	5.0	5.8	6.0	5.5	5.9	5.9
4.3 ≤ E < 4.5	4.9	5.0	5.8	6.0	5.4	5.9	5.9
4.5 ≤ E < 4.7	4.8	4.9	5.7	5.9	5.4	5.8	5.8
4.7 ≤ E < 4.9	4.8	4.9	5.7	5.9	5.3	5.8	5.8
E ≥ 4.9	4.7	4.9	5.7	5.9	5.3	5.8	5.8

Table B2-15 Loading Table for PWR Fuel – 959 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	42 < Assembly Average Burnup ≤ 43 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.7	5.8	6.8	7.0	6.3	6.9	6.9
2.7 ≤ E < 2.9	5.6	5.7	6.7	6.9	6.2	6.8	6.8
2.9 ≤ E < 3.1	5.5	5.6	6.6	6.8	6.0	6.7	6.7
3.1 ≤ E < 3.3	5.4	5.6	6.5	6.7	6.0	6.6	6.6
3.3 ≤ E < 3.5	5.3	5.5	6.4	6.6	5.9	6.5	6.5
3.5 ≤ E < 3.7	5.3	5.4	6.3	6.5	5.9	6.4	6.4
3.7 ≤ E < 3.9	5.2	5.3	6.2	6.5	5.8	6.3	6.3
3.9 ≤ E < 4.1	5.1	5.3	6.1	6.4	5.7	6.2	6.2
4.1 ≤ E < 4.3	5.0	5.2	6.0	6.3	5.7	6.2	6.1
4.3 ≤ E < 4.5	5.0	5.2	6.0	6.2	5.6	6.1	6.1
4.5 ≤ E < 4.7	5.0	5.1	5.9	6.2	5.6	6.0	6.0
4.7 ≤ E < 4.9	4.9	5.0	5.9	6.1	5.5	6.0	6.0
E ≥ 4.9	4.9	5.0	5.8	6.0	5.5	6.0	5.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	43 < Assembly Average Burnup ≤ 44 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.9	6.0	7.1	7.4	6.6	7.2	7.2
2.7 ≤ E < 2.9	5.8	5.9	7.0	7.3	6.5	7.0	7.0
2.9 ≤ E < 3.1	5.7	5.8	6.9	7.1	6.4	6.9	6.9
3.1 ≤ E < 3.3	5.6	5.8	6.8	7.0	6.2	6.8	6.8
3.3 ≤ E < 3.5	5.5	5.7	6.7	6.9	6.1	6.8	6.7
3.5 ≤ E < 3.7	5.5	5.6	6.6	6.8	6.0	6.7	6.7
3.7 ≤ E < 3.9	5.4	5.6	6.5	6.8	6.0	6.6	6.6
3.9 ≤ E < 4.1	5.3	5.5	6.4	6.7	5.9	6.5	6.5
4.1 ≤ E < 4.3	5.3	5.4	6.3	6.6	5.9	6.4	6.4
4.3 ≤ E < 4.5	5.2	5.4	6.2	6.5	5.8	6.4	6.4
4.5 ≤ E < 4.7	5.1	5.3	6.2	6.5	5.8	6.3	6.3
4.7 ≤ E < 4.9	5.1	5.3	6.1	6.4	5.7	6.2	6.2
E ≥ 4.9	5.0	5.2	6.0	6.3	5.7	6.2	6.2

Table B2-15 Loading Table for PWR Fuel – 959 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	44 < Assembly Average Burnup ≤ 45 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	6.0	6.2	7.3	7.7	6.7	7.4	7.4
2.9 ≤ E < 3.1	5.9	6.0	7.2	7.6	6.6	7.3	7.3
3.1 ≤ E < 3.3	5.8	6.0	7.0	7.4	6.5	7.2	7.1
3.3 ≤ E < 3.5	5.7	5.9	6.9	7.3	6.4	7.0	7.0
3.5 ≤ E < 3.7	5.7	5.8	6.8	7.2	6.3	6.9	6.9
3.7 ≤ E < 3.9	5.6	5.8	6.8	7.0	6.2	6.9	6.9
3.9 ≤ E < 4.1	5.5	5.7	6.7	7.0	6.2	6.8	6.8
4.1 ≤ E < 4.3	5.5	5.6	6.6	6.9	6.1	6.7	6.7
4.3 ≤ E < 4.5	5.4	5.6	6.5	6.8	6.0	6.7	6.6
4.5 ≤ E < 4.7	5.3	5.5	6.5	6.7	6.0	6.6	6.6
4.7 ≤ E < 4.9	5.3	5.5	6.4	6.7	5.9	6.5	6.5
E ≥ 4.9	5.2	5.4	6.3	6.6	5.9	6.5	6.5

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	45 < Assembly Average Burnup ≤ 46 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	6.7	6.9	8.5	9.0	7.7	8.6	8.6
2.9 ≤ E < 3.1	6.6	6.8	8.3	8.8	7.5	8.4	8.4
3.1 ≤ E < 3.3	6.5	6.7	8.1	8.6	7.4	8.2	8.2
3.3 ≤ E < 3.5	6.4	6.6	8.0	8.5	7.3	8.1	8.1
3.5 ≤ E < 3.7	6.3	6.5	7.8	8.3	7.1	8.0	7.9
3.7 ≤ E < 3.9	6.2	6.4	7.7	8.2	7.0	7.8	7.8
3.9 ≤ E < 4.1	6.1	6.3	7.6	8.0	6.9	7.7	7.7
4.1 ≤ E < 4.3	6.0	6.2	7.5	7.9	6.9	7.7	7.6
4.3 ≤ E < 4.5	6.0	6.2	7.4	7.8	6.8	7.6	7.6
4.5 ≤ E < 4.7	5.9	6.1	7.3	7.8	6.7	7.5	7.5
4.7 ≤ E < 4.9	5.9	6.0	7.2	7.7	6.7	7.4	7.4
E ≥ 4.9	5.8	6.0	7.2	7.6	6.6	7.3	7.3

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	46 < Assembly Average Burnup ≤ 47 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.0	7.3	9.0	9.6	8.0	9.1	9.1
2.9 ≤ E < 3.1	6.9	7.1	8.8	9.4	7.9	8.9	8.9
3.1 ≤ E < 3.3	6.8	7.0	8.6	9.2	7.8	8.7	8.7
3.3 ≤ E < 3.5	6.7	6.9	8.4	9.0	7.6	8.6	8.6
3.5 ≤ E < 3.7	6.6	6.8	8.3	8.8	7.5	8.4	8.4
3.7 ≤ E < 3.9	6.5	6.7	8.1	8.7	7.4	8.3	8.3
3.9 ≤ E < 4.1	6.4	6.6	8.0	8.5	7.3	8.1	8.1
4.1 ≤ E < 4.3	6.3	6.5	7.9	8.4	7.2	8.0	8.0
4.3 ≤ E < 4.5	6.2	6.5	7.8	8.3	7.1	7.9	7.9
4.5 ≤ E < 4.7	6.1	6.4	7.7	8.2	7.0	7.9	7.8
4.7 ≤ E < 4.9	6.0	6.3	7.6	8.1	6.9	7.8	7.8
E ≥ 4.9	6.0	6.2	7.6	8.0	6.9	7.7	7.7

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	47 < Assembly Average Burnup ≤ 48 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.4	7.7	9.6	10.3	8.6	9.7	9.7
2.9 ≤ E < 3.1	7.2	7.6	9.4	10.0	8.4	9.5	9.5
3.1 ≤ E < 3.3	7.1	7.4	9.1	9.8	8.2	9.3	9.3
3.3 ≤ E < 3.5	7.0	7.2	8.9	9.6	8.0	9.1	9.0
3.5 ≤ E < 3.7	6.9	7.1	8.8	9.4	7.9	8.9	8.9
3.7 ≤ E < 3.9	6.7	7.0	8.6	9.2	7.8	8.8	8.7
3.9 ≤ E < 4.1	6.7	6.9	8.5	9.0	7.6	8.6	8.6
4.1 ≤ E < 4.3	6.6	6.8	8.4	8.9	7.6	8.5	8.5
4.3 ≤ E < 4.5	6.5	6.7	8.2	8.8	7.4	8.4	8.4
4.5 ≤ E < 4.7	6.4	6.7	8.1	8.7	7.4	8.3	8.3
4.7 ≤ E < 4.9	6.3	6.6	8.0	8.6	7.3	8.2	8.2
E ≥ 4.9	6.2	6.5	7.9	8.5	7.2	8.1	8.1

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	48 < Assembly Average Burnup ≤ 49 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.8	8.1	10.2	11.1	9.0	10.4	10.4
2.9 ≤ E < 3.1	7.6	7.9	10.0	10.8	8.8	10.1	10.1
3.1 ≤ E < 3.3	7.5	7.8	9.7	10.5	8.6	9.9	9.8
3.3 ≤ E < 3.5	7.3	7.6	9.5	10.2	8.5	9.7	9.6
3.5 ≤ E < 3.7	7.2	7.5	9.3	10.0	8.3	9.5	9.4
3.7 ≤ E < 3.9	7.0	7.4	9.1	9.8	8.2	9.3	9.3
3.9 ≤ E < 4.1	6.9	7.2	9.0	9.6	8.0	9.1	9.1
4.1 ≤ E < 4.3	6.8	7.1	8.8	9.5	7.9	9.0	9.0
4.3 ≤ E < 4.5	6.8	7.0	8.7	9.3	7.8	8.9	8.9
4.5 ≤ E < 4.7	6.7	6.9	8.6	9.2	7.7	8.8	8.7
4.7 ≤ E < 4.9	6.6	6.9	8.5	9.1	7.6	8.7	8.6
E ≥ 4.9	6.5	6.8	8.4	9.0	7.6	8.6	8.5

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	49 < Assembly Average Burnup ≤ 50 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	8.0	8.3	10.7	11.6	9.4	10.9	10.9
3.1 ≤ E < 3.3	7.8	8.1	10.4	11.3	9.1	10.6	10.6
3.3 ≤ E < 3.5	7.7	7.9	10.1	11.0	9.0	10.3	10.3
3.5 ≤ E < 3.7	7.5	7.8	9.9	10.8	8.8	10.0	10.0
3.7 ≤ E < 3.9	7.4	7.6	9.7	10.5	8.6	9.9	9.9
3.9 ≤ E < 4.1	7.3	7.5	9.5	10.3	8.5	9.7	9.7
4.1 ≤ E < 4.3	7.1	7.4	9.4	10.1	8.3	9.6	9.5
4.3 ≤ E < 4.5	7.0	7.3	9.2	9.9	8.2	9.4	9.4
4.5 ≤ E < 4.7	6.9	7.2	9.1	9.8	8.1	9.3	9.2
4.7 ≤ E < 4.9	6.9	7.1	9.0	9.6	8.0	9.1	9.1
E ≥ 4.9	6.8	7.0	8.9	9.5	7.9	9.0	9.0

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	50 < Assembly Average Burnup ≤ 51 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	8.3	8.7	11.5	12.3	10.0	11.6	11.6
3.1 ≤ E < 3.3	8.0	8.5	11.2	12.0	9.8	11.3	11.3
3.3 ≤ E < 3.5	7.9	8.3	10.9	11.7	9.5	11.1	11.1
3.5 ≤ E < 3.7	7.8	8.1	10.6	11.5	9.3	10.8	10.8
3.7 ≤ E < 3.9	7.6	8.0	10.4	11.3	9.1	10.6	10.6
3.9 ≤ E < 4.1	7.5	7.9	10.1	11.1	9.0	10.4	10.4
4.1 ≤ E < 4.3	7.4	7.8	10.0	10.9	8.8	10.2	10.1
4.3 ≤ E < 4.5	7.3	7.6	9.8	10.6	8.7	10.0	10.0
4.5 ≤ E < 4.7	7.1	7.5	9.7	10.5	8.6	9.8	9.8
4.7 ≤ E < 4.9	7.0	7.4	9.5	10.3	8.5	9.7	9.7
E ≥ 4.9	7.0	7.3	9.4	10.1	8.3	9.6	9.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	51 < Assembly Average Burnup ≤ 52 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	8.8	9.3	12.2	13.0	10.7	12.4	12.4
3.1 ≤ E < 3.3	8.5	9.0	11.9	12.6	10.4	12.1	12.0
3.3 ≤ E < 3.5	8.3	8.8	11.6	12.3	10.1	11.8	11.8
3.5 ≤ E < 3.7	8.1	8.6	11.4	11.9	9.9	11.6	11.5
3.7 ≤ E < 3.9	8.0	8.5	11.1	11.7	9.7	11.3	11.3
3.9 ≤ E < 4.1	7.9	8.3	10.9	11.5	9.5	11.1	11.1
4.1 ≤ E < 4.3	7.7	8.1	10.7	11.3	9.3	10.9	10.9
4.3 ≤ E < 4.5	7.6	8.0	10.5	11.1	9.2	10.7	10.7
4.5 ≤ E < 4.7	7.5	7.9	10.3	11.0	9.0	10.5	10.5
4.7 ≤ E < 4.9	7.4	7.8	10.1	10.8	8.9	10.3	10.3
E ≥ 4.9	7.3	7.7	10.0	10.6	8.8	10.2	10.2

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	52 < Assembly Average Burnup ≤ 53 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	9.3	9.8	12.8	13.8	11.4	13.3	13.3
3.1 ≤ E < 3.3	9.0	9.6	12.4	13.5	11.2	13.0	13.0
3.3 ≤ E < 3.5	8.8	9.3	12.1	13.2	10.9	12.6	12.6
3.5 ≤ E < 3.7	8.6	9.1	11.8	12.8	10.6	12.3	12.3
3.7 ≤ E < 3.9	8.4	9.0	11.5	12.6	10.3	12.0	12.0
3.9 ≤ E < 4.1	8.2	8.8	11.3	12.3	10.1	11.8	11.8
4.1 ≤ E < 4.3	8.1	8.6	11.1	12.0	9.9	11.6	11.6
4.3 ≤ E < 4.5	8.0	8.5	10.9	11.8	9.7	11.4	11.4
4.5 ≤ E < 4.7	7.9	8.3	10.7	11.7	9.6	11.2	11.2
4.7 ≤ E < 4.9	7.8	8.2	10.6	11.5	9.4	11.1	11.0
E ≥ 4.9	7.7	8.1	10.4	11.3	9.3	10.9	10.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	53 < Assembly Average Burnup ≤ 54 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	9.8	10.5	13.6	14.9	12.2	14.2	14.2
3.1 ≤ E < 3.3	9.6	10.2	13.3	14.4	11.8	13.8	13.8
3.3 ≤ E < 3.5	9.3	9.9	12.9	14.0	11.6	13.5	13.5
3.5 ≤ E < 3.7	9.1	9.7	12.6	13.7	11.3	13.2	13.2
3.7 ≤ E < 3.9	8.9	9.5	12.3	13.4	11.0	12.9	12.9
3.9 ≤ E < 4.1	8.7	9.3	12.0	13.2	10.8	12.6	12.6
4.1 ≤ E < 4.3	8.6	9.1	11.8	12.9	10.6	12.4	12.4
4.3 ≤ E < 4.5	8.4	8.9	11.6	12.6	10.4	12.1	12.1
4.5 ≤ E < 4.7	8.3	8.8	11.4	12.4	10.1	11.9	11.9
4.7 ≤ E < 4.9	8.1	8.7	11.3	12.2	10.0	11.8	11.7
E ≥ 4.9	8.0	8.8	11.1	12.0	9.9	11.6	11.6

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	54 < Assembly Average Burnup ≤ 55 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	10.1	10.9	14.1	15.4	12.7	14.8	14.8
3.3 ≤ E < 3.5	9.9	10.6	13.8	15.0	12.3	14.4	14.4
3.5 ≤ E < 3.7	9.6	10.3	13.5	14.7	12.0	14.0	14.0
3.7 ≤ E < 3.9	9.4	10.1	13.1	14.3	11.8	13.8	13.8
3.9 ≤ E < 4.1	9.2	9.8	12.9	14.0	11.5	13.5	13.5
4.1 ≤ E < 4.3	9.0	9.7	12.6	13.8	11.3	13.3	13.2
4.3 ≤ E < 4.5	8.9	9.5	12.3	13.5	11.1	13.0	13.0
4.5 ≤ E < 4.7	8.7	9.3	12.1	13.3	10.9	12.8	12.7
4.7 ≤ E < 4.9	8.6	9.1	11.9	13.1	10.7	12.6	12.5
E ≥ 4.9	8.5	9.0	11.7	12.9	10.5	12.3	12.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	55 < Assembly Average Burnup ≤ 56 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	10.9	11.6	15.1	16.5	13.1	15.8	15.8
3.3 ≤ E < 3.5	10.5	11.3	14.7	16.0	12.8	15.4	15.4
3.5 ≤ E < 3.7	10.2	11.0	14.3	15.7	12.4	15.1	15.0
3.7 ≤ E < 3.9	9.9	10.8	14.0	15.3	12.1	14.7	14.7
3.9 ≤ E < 4.1	9.7	10.5	13.7	15.0	11.9	14.4	14.4
4.1 ≤ E < 4.3	9.5	10.2	13.4	14.7	11.7	14.1	14.1
4.3 ≤ E < 4.5	9.3	10.0	13.2	14.5	11.4	13.8	13.8
4.5 ≤ E < 4.7	9.2	9.9	12.9	14.2	11.2	13.6	13.6
4.7 ≤ E < 4.9	9.0	9.7	12.7	13.9	11.1	13.4	13.4
E ≥ 4.9	8.9	9.5	12.5	13.8	10.9	13.2	13.2

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	56 < Assembly Average Burnup ≤ 57 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	11.5	12.3	16.0	17.4	14.0	16.8	16.8
3.3 ≤ E < 3.5	11.2	12.0	15.6	17.1	13.6	16.4	16.4
3.5 ≤ E < 3.7	10.9	11.7	15.3	16.7	13.3	16.0	16.0
3.7 ≤ E < 3.9	10.6	11.4	14.9	16.3	13.0	15.7	15.6
3.9 ≤ E < 4.1	10.3	11.2	14.6	16.0	12.6	15.4	15.3
4.1 ≤ E < 4.3	10.1	10.9	14.2	15.7	12.4	15.1	15.1
4.3 ≤ E < 4.5	9.9	10.7	14.0	15.4	12.1	14.8	14.8
4.5 ≤ E < 4.7	9.7	10.5	13.8	15.2	11.9	14.5	14.5
4.7 ≤ E < 4.9	9.5	10.3	13.6	14.9	11.7	14.2	14.2
E ≥ 4.9	9.4	10.1	13.4	14.7	11.5	14.0	14.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	57 < Assembly Average Burnup ≤ 58 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	12.2	13.2	17.0	18.5	14.9	17.8	17.7
3.3 ≤ E < 3.5	11.9	12.8	16.7	18.1	14.5	17.4	17.4
3.5 ≤ E < 3.7	11.6	12.4	16.2	17.7	14.1	17.0	17.0
3.7 ≤ E < 3.9	11.3	12.1	15.9	17.3	13.8	16.7	16.6
3.9 ≤ E < 4.1	11.0	11.9	15.6	17.0	13.5	16.3	16.3
4.1 ≤ E < 4.3	10.7	11.6	15.3	16.7	13.2	16.0	16.0
4.3 ≤ E < 4.5	10.5	11.4	15.0	16.4	12.9	15.7	15.7
4.5 ≤ E < 4.7	10.3	11.2	14.7	16.1	12.7	15.5	15.4
4.7 ≤ E < 4.9	10.0	10.9	14.4	15.8	12.4	15.2	15.2
E ≥ 4.9	9.9	10.8	14.2	15.6	12.2	15.0	14.9

Table B2-16 Loading Table for PWR Fuel – 911 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	58 < Assembly Average Burnup ≤ 59 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	13.0	14.0	18.0	19.5	15.8	18.8	18.8
3.3 ≤ E < 3.5	12.6	13.6	17.6	19.1	15.4	18.4	18.4
3.5 ≤ E < 3.7	12.2	13.3	17.2	18.7	15.0	18.0	18.0
3.7 ≤ E < 3.9	11.9	12.9	16.9	18.3	14.6	17.7	17.7
3.9 ≤ E < 4.1	11.6	12.6	16.5	18.0	14.3	17.4	17.3
4.1 ≤ E < 4.3	11.4	12.3	16.2	17.7	14.0	17.0	17.0
4.3 ≤ E < 4.5	11.1	12.0	15.9	17.4	13.7	16.7	16.7
4.5 ≤ E < 4.7	10.9	11.8	15.6	17.1	13.5	16.4	16.4
4.7 ≤ E < 4.9	10.7	11.6	15.4	16.8	13.2	16.1	16.1
E ≥ 4.9	10.5	11.4	15.1	16.6	13.0	15.9	15.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	59 < Assembly Average Burnup ≤ 60 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	-	-	-	-	-	-	-
3.3 ≤ E < 3.5	13.4	14.4	18.6	20.1	16.3	19.0	19.0
3.5 ≤ E < 3.7	13.0	14.1	18.2	19.7	15.9	18.6	18.5
3.7 ≤ E < 3.9	12.7	13.7	17.8	19.4	15.5	18.2	18.1
3.9 ≤ E < 4.1	12.3	13.4	17.5	19.0	15.2	17.9	17.8
4.1 ≤ E < 4.3	12.0	13.1	17.1	18.7	14.9	17.5	17.5
4.3 ≤ E < 4.5	11.8	12.8	16.8	18.4	14.6	17.2	17.2
4.5 ≤ E < 4.7	11.6	12.6	16.5	18.0	14.3	16.9	16.9
4.7 ≤ E < 4.9	11.3	12.3	16.2	17.8	14.0	16.6	16.6
E ≥ 4.9	11.2	12.1	16.0	17.6	13.8	16.4	16.3

Table B2-17 Loading Table for PWR Fuel – 1,200 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	30 < Assembly Average Burnup ≤ 32.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2.3 ≤ E < 2.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Initial Assembly Avg. Enrichment wt % ^{235}U (E)	**32.5 < Assembly Average Burnup ≤ 35 GWd/MTU Minimum Cooling Time (years)**						
	CE 14×14	**WE 14×14**	**WE 15×15**	**B&W 15×15**	**CE 16×16**	**WE 17×17**	**B&W 17×17**
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.0	4.0	4.0	4.1	4.0	4.1	4.1
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.1	4.0	4.0	4.0
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-17 Loading Table for PWR Fuel – 1,200 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	35 < Assembly Average Burnup ≤ 37.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.0	4.0	4.3	4.4	4.2	4.4	4.4
2.5 ≤ E < 2.7	4.0	4.0	4.3	4.4	4.1	4.4	4.4
2.7 ≤ E < 2.9	4.0	4.0	4.2	4.3	4.1	4.3	4.3
2.9 ≤ E < 3.1	4.0	4.0	4.2	4.3	4.0	4.3	4.3
3.1 ≤ E < 3.3	4.0	4.0	4.1	4.2	4.0	4.2	4.2
3.3 ≤ E < 3.5	4.0	4.0	4.1	4.2	4.0	4.2	4.2
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.2	4.0	4.2	4.2
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.1	4.0	4.1	4.1
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.1	4.0	4.1	4.1
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	37.5 < Assembly Average Burnup ≤ 40 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	4.0	4.1	4.6	4.8	4.4	4.7	4.7
2.7 ≤ E < 2.9	4.0	4.0	4.6	4.7	4.4	4.7	4.7
2.9 ≤ E < 3.1	4.0	4.0	4.5	4.6	4.3	4.6	4.6
3.1 ≤ E < 3.3	4.0	4.0	4.5	4.6	4.3	4.5	4.5
3.3 ≤ E < 3.5	4.0	4.0	4.4	4.5	4.2	4.5	4.5
3.5 ≤ E < 3.7	4.0	4.0	4.4	4.5	4.2	4.5	4.4
3.7 ≤ E < 3.9	4.0	4.0	4.3	4.4	4.1	4.4	4.4
3.9 ≤ E < 4.1	4.0	4.0	4.3	4.4	4.1	4.4	4.4
4.1 ≤ E < 4.3	4.0	4.0	4.2	4.3	4.1	4.3	4.3
4.3 ≤ E < 4.5	4.0	4.0	4.2	4.3	4.0	4.3	4.3
4.5 ≤ E < 4.7	4.0	4.0	4.2	4.3	4.0	4.3	4.3
4.7 ≤ E < 4.9	4.0	4.0	4.1	4.3	4.0	4.3	4.3
E ≥ 4.9	4.0	4.0	4.1	4.2	4.0	4.2	4.2

Table B2-17 Loading Table for PWR Fuel – 1,200 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	40 < Assembly Average Burnup ≤ 41 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	4.2	4.2	4.8	4.9	4.5	4.9	4.9
2.7 ≤ E < 2.9	4.1	4.2	4.7	4.8	4.5	4.8	4.8
2.9 ≤ E < 3.1	4.0	4.1	4.7	4.8	4.4	4.8	4.7
3.1 ≤ E < 3.3	4.0	4.1	4.6	4.7	4.4	4.7	4.7
3.3 ≤ E < 3.5	4.0	4.0	4.5	4.7	4.4	4.6	4.6
3.5 ≤ E < 3.7	4.0	4.0	4.5	4.6	4.3	4.6	4.6
3.7 ≤ E < 3.9	4.0	4.0	4.4	4.5	4.2	4.5	4.5
3.9 ≤ E < 4.1	4.0	4.0	4.4	4.5	4.2	4.5	4.5
4.1 ≤ E < 4.3	4.0	4.0	4.4	4.5	4.2	4.5	4.5
4.3 ≤ E < 4.5	4.0	4.0	4.3	4.4	4.1	4.4	4.4
4.5 ≤ E < 4.7	4.0	4.0	4.3	4.4	4.1	4.4	4.4
4.7 ≤ E < 4.9	4.0	4.0	4.3	4.4	4.1	4.4	4.4
E ≥ 4.9	4.0	4.0	4.2	4.3	4.0	4.4	4.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	41 < Assembly Average Burnup ≤ 42 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	4.3	4.4	4.9	5.1	4.7	5.0	5.0
2.7 ≤ E < 2.9	4.2	4.3	4.9	5.0	4.6	5.0	5.0
2.9 ≤ E < 3.1	4.2	4.2	4.8	4.9	4.6	4.9	4.9
3.1 ≤ E < 3.3	4.1	4.2	4.7	4.9	4.5	4.8	4.8
3.3 ≤ E < 3.5	4.0	4.1	4.7	4.8	4.5	4.8	4.8
3.5 ≤ E < 3.7	4.0	4.1	4.6	4.8	4.4	4.7	4.7
3.7 ≤ E < 3.9	4.0	4.1	4.6	4.7	4.4	4.7	4.7
3.9 ≤ E < 4.1	4.0	4.0	4.5	4.6	4.3	4.6	4.6
4.1 ≤ E < 4.3	4.0	4.0	4.5	4.6	4.3	4.6	4.6
4.3 ≤ E < 4.5	4.0	4.0	4.4	4.6	4.3	4.5	4.5
4.5 ≤ E < 4.7	4.0	4.0	4.4	4.5	4.2	4.5	4.5
4.7 ≤ E < 4.9	4.0	4.0	4.4	4.5	4.2	4.5	4.5
E ≥ 4.9	4.0	4.0	4.3	4.5	4.2	4.5	4.5

Table B2-17 Loading Table for PWR Fuel – 1,200 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	42 < Assembly Average Burnup ≤ 43 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	4.4	4.5	5.1	5.3	4.9	5.2	5.2
2.7 ≤ E < 2.9	4.4	4.4	5.0	5.2	4.8	5.1	5.1
2.9 ≤ E < 3.1	4.3	4.4	5.0	5.1	4.7	5.0	5.0
3.1 ≤ E < 3.3	4.2	4.3	4.9	5.0	4.7	5.0	5.0
3.3 ≤ E < 3.5	4.2	4.3	4.8	5.0	4.6	4.9	4.9
3.5 ≤ E < 3.7	4.1	4.2	4.8	4.9	4.5	4.9	4.9
3.7 ≤ E < 3.9	4.1	4.2	4.7	4.9	4.5	4.8	4.8
3.9 ≤ E < 4.1	4.0	4.1	4.7	4.8	4.4	4.8	4.8
4.1 ≤ E < 4.3	4.0	4.1	4.6	4.8	4.4	4.7	4.7
4.3 ≤ E < 4.5	4.0	4.0	4.6	4.7	4.4	4.7	4.7
4.5 ≤ E < 4.7	4.0	4.0	4.5	4.7	4.3	4.7	4.6
4.7 ≤ E < 4.9	4.0	4.0	4.5	4.6	4.3	4.6	4.6
E ≥ 4.9	4.0	4.0	4.4	4.6	4.3	4.6	4.5

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	43 < Assembly Average Burnup ≤ 44 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	4.5	4.6	5.3	5.5	5.0	5.4	5.4
2.7 ≤ E < 2.9	4.5	4.6	5.2	5.4	4.9	5.3	5.3
2.9 ≤ E < 3.1	4.4	4.5	5.1	5.3	4.9	5.2	5.2
3.1 ≤ E < 3.3	4.4	4.4	5.0	5.2	4.8	5.2	5.2
3.3 ≤ E < 3.5	4.3	4.4	5.0	5.1	4.7	5.1	5.1
3.5 ≤ E < 3.7	4.2	4.3	4.9	5.1	4.7	5.0	5.0
3.7 ≤ E < 3.9	4.2	4.3	4.9	5.0	4.6	5.0	5.0
3.9 ≤ E < 4.1	4.1	4.3	4.8	5.0	4.6	4.9	4.9
4.1 ≤ E < 4.3	4.1	4.2	4.8	4.9	4.5	4.9	4.9
4.3 ≤ E < 4.5	4.1	4.2	4.7	4.9	4.5	4.8	4.8
4.5 ≤ E < 4.7	4.0	4.2	4.7	4.8	4.5	4.8	4.8
4.7 ≤ E < 4.9	4.0	4.1	4.6	4.8	4.4	4.8	4.7
E ≥ 4.9	4.0	4.1	4.6	4.8	4.4	4.7	4.7

Table B2-17 Loading Table for PWR Fuel – 1,200 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	44 < Assembly Average Burnup ≤ 45 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	4.6	4.7	5.4	5.6	5.1	5.5	5.5
2.9 ≤ E < 3.1	4.5	4.6	5.3	5.5	5.0	5.4	5.4
3.1 ≤ E < 3.3	4.5	4.6	5.2	5.4	4.9	5.4	5.4
3.3 ≤ E < 3.5	4.4	4.5	5.2	5.4	4.9	5.3	5.3
3.5 ≤ E < 3.7	4.4	4.5	5.1	5.3	4.8	5.2	5.2
3.7 ≤ E < 3.9	4.3	4.4	5.0	5.2	4.8	5.1	5.1
3.9 ≤ E < 4.1	4.3	4.4	5.0	5.1	4.7	5.1	5.1
4.1 ≤ E < 4.3	4.2	4.3	4.9	5.1	4.7	5.0	5.0
4.3 ≤ E < 4.5	4.2	4.3	4.9	5.0	4.6	5.0	5.0
4.5 ≤ E < 4.7	4.1	4.2	4.8	5.0	4.6	4.9	4.9
4.7 ≤ E < 4.9	4.1	4.2	4.8	4.9	4.5	4.9	4.9
E ≥ 4.9	4.0	4.2	4.7	4.9	4.5	4.9	4.8

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	45 < Assembly Average Burnup ≤ 46 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	5.0	5.2	6.0	6.2	5.6	6.0	6.0
2.9 ≤ E < 3.1	5.0	5.1	5.9	6.0	5.5	6.0	6.0
3.1 ≤ E < 3.3	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.3 ≤ E < 3.5	4.8	4.9	5.7	5.9	5.4	5.8	5.8
3.5 ≤ E < 3.7	4.8	4.9	5.6	5.8	5.3	5.7	5.7
3.7 ≤ E < 3.9	4.7	4.8	5.6	5.8	5.2	5.7	5.7
3.9 ≤ E < 4.1	4.6	4.8	5.5	5.7	5.1	5.6	5.6
4.1 ≤ E < 4.3	4.6	4.7	5.4	5.6	5.1	5.5	5.6
4.3 ≤ E < 4.5	4.5	4.6	5.4	5.6	5.0	5.5	5.5
4.5 ≤ E < 4.7	4.5	4.6	5.3	5.5	5.0	5.4	5.4
4.7 ≤ E < 4.9	4.4	4.6	5.3	5.5	4.9	5.4	5.4
E ≥ 4.9	4.4	4.5	5.2	5.4	4.9	5.4	5.3

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	46 < Assembly Average Burnup ≤ 47 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	5.2	5.4	6.2	6.5	5.8	6.3	6.3
2.9 ≤ E < 3.1	5.1	5.3	6.1	6.4	5.7	6.2	6.2
3.1 ≤ E < 3.3	5.0	5.2	6.0	6.2	5.6	6.1	6.1
3.3 ≤ E < 3.5	5.0	5.1	5.9	6.1	5.6	6.0	6.0
3.5 ≤ E < 3.7	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.7 ≤ E < 3.9	4.8	5.0	5.8	6.0	5.4	5.9	5.9
3.9 ≤ E < 4.1	4.8	4.9	5.7	5.9	5.3	5.8	5.8
4.1 ≤ E < 4.3	4.7	4.8	5.6	5.8	5.3	5.8	5.7
4.3 ≤ E < 4.5	4.7	4.8	5.6	5.8	5.2	5.7	5.7
4.5 ≤ E < 4.7	4.6	4.7	5.5	5.7	5.2	5.6	5.6
4.7 ≤ E < 4.9	4.6	4.7	5.5	5.7	5.1	5.6	5.6
E ≥ 4.9	4.5	4.7	5.4	5.6	5.0	5.5	5.5

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	47 < Assembly Average Burnup ≤ 48 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	5.4	5.6	6.5	6.8	6.0	6.6	6.6
2.9 ≤ E < 3.1	5.3	5.5	6.4	6.6	5.9	6.5	6.5
3.1 ≤ E < 3.3	5.2	5.4	6.2	6.5	5.8	6.4	6.4
3.3 ≤ E < 3.5	5.1	5.3	6.1	6.4	5.8	6.2	6.2
3.5 ≤ E < 3.7	5.0	5.2	6.0	6.3	5.7	6.2	6.1
3.7 ≤ E < 3.9	5.0	5.1	5.9	6.2	5.6	6.0	6.0
3.9 ≤ E < 4.1	4.9	5.0	5.9	6.1	5.5	6.0	6.0
4.1 ≤ E < 4.3	4.9	5.0	5.8	6.0	5.5	5.9	5.9
4.3 ≤ E < 4.5	4.8	4.9	5.8	6.0	5.4	5.9	5.9
4.5 ≤ E < 4.7	4.8	4.9	5.7	5.9	5.3	5.8	5.8
4.7 ≤ E < 4.9	4.7	4.9	5.7	5.8	5.3	5.8	5.8
E ≥ 4.9	4.7	4.8	5.6	5.8	5.2	5.7	5.7

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	48 < Assembly Average Burnup ≤ 49 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	5.6	5.8	6.8	7.0	6.3	6.9	6.9
2.9 ≤ E < 3.1	5.5	5.7	6.7	6.9	6.1	6.8	6.7
3.1 ≤ E < 3.3	5.4	5.6	6.5	6.8	6.0	6.6	6.6
3.3 ≤ E < 3.5	5.3	5.5	6.4	6.7	5.9	6.5	6.5
3.5 ≤ E < 3.7	5.2	5.4	6.3	6.6	5.9	6.4	6.4
3.7 ≤ E < 3.9	5.2	5.3	6.2	6.5	5.8	6.3	6.3
3.9 ≤ E < 4.1	5.1	5.2	6.1	6.4	5.7	6.2	6.2
4.1 ≤ E < 4.3	5.0	5.2	6.0	6.3	5.7	6.1	6.1
4.3 ≤ E < 4.5	5.0	5.1	5.9	6.2	5.6	6.0	6.0
4.5 ≤ E < 4.7	4.9	5.0	5.9	6.1	5.5	6.0	6.0
4.7 ≤ E < 4.9	4.8	5.0	5.8	6.0	5.5	5.9	5.9
E ≥ 4.9	4.8	4.9	5.8	6.0	5.4	5.9	5.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	49 < Assembly Average Burnup ≤ 50 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	5.7	5.8	6.9	7.3	6.4	7.0	7.0
3.1 ≤ E < 3.3	5.6	5.7	6.8	7.1	6.3	6.9	6.9
3.3 ≤ E < 3.5	5.5	5.6	6.7	7.0	6.2	6.8	6.8
3.5 ≤ E < 3.7	5.4	5.5	6.6	6.9	6.0	6.7	6.7
3.7 ≤ E < 3.9	5.4	5.5	6.5	6.8	6.0	6.6	6.6
3.9 ≤ E < 4.1	5.3	5.4	6.4	6.7	5.9	6.5	6.5
4.1 ≤ E < 4.3	5.2	5.3	6.3	6.6	5.8	6.4	6.4
4.3 ≤ E < 4.5	5.1	5.2	6.2	6.5	5.8	6.3	6.3
4.5 ≤ E < 4.7	5.0	5.2	6.1	6.4	5.7	6.2	6.2
4.7 ≤ E < 4.9	5.0	5.1	6.0	6.3	5.7	6.2	6.2
E ≥ 4.9	4.9	5.0	6.0	6.2	5.6	6.1	6.1

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	50 < Assembly Average Burnup ≤ 51 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	5.8	6.0	7.3	7.6	6.7	7.4	7.4
3.1 ≤ E < 3.3	5.8	5.9	7.1	7.5	6.6	7.2	7.2
3.3 ≤ E < 3.5	5.7	5.8	7.0	7.3	6.4	7.1	7.0
3.5 ≤ E < 3.7	5.6	5.7	6.8	7.2	6.3	6.9	6.9
3.7 ≤ E < 3.9	5.5	5.7	6.7	7.0	6.2	6.9	6.8
3.9 ≤ E < 4.1	5.4	5.6	6.6	6.9	6.1	6.8	6.8
4.1 ≤ E < 4.3	5.3	5.5	6.5	6.8	6.0	6.7	6.7
4.3 ≤ E < 4.5	5.2	5.4	6.4	6.8	6.0	6.6	6.6
4.5 ≤ E < 4.7	5.2	5.4	6.4	6.7	5.9	6.5	6.5
4.7 ≤ E < 4.9	5.1	5.3	6.3	6.6	5.8	6.4	6.4
E ≥ 4.9	5.0	5.2	6.2	6.5	5.8	6.4	6.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	51 < Assembly Average Burnup ≤ 52 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	6.0	6.3	7.6	7.9	6.9	7.7	7.7
3.1 ≤ E < 3.3	5.9	6.1	7.5	7.7	6.8	7.6	7.6
3.3 ≤ E < 3.5	5.8	6.0	7.3	7.6	6.7	7.4	7.4
3.5 ≤ E < 3.7	5.8	5.9	7.1	7.4	6.6	7.3	7.3
3.7 ≤ E < 3.9	5.7	5.9	7.0	7.3	6.5	7.1	7.1
3.9 ≤ E < 4.1	5.6	5.8	6.9	7.1	6.4	7.0	7.0
4.1 ≤ E < 4.3	5.5	5.7	6.8	7.0	6.3	6.9	6.9
4.3 ≤ E < 4.5	5.4	5.6	6.7	6.9	6.2	6.8	6.8
4.5 ≤ E < 4.7	5.4	5.6	6.6	6.8	6.1	6.8	6.8
4.7 ≤ E < 4.9	5.3	5.5	6.5	6.8	6.0	6.7	6.7
E ≥ 4.9	5.2	5.4	6.5	6.7	6.0	6.6	6.6

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	52 < Assembly Average Burnup ≤ 53 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	6.3	6.5	7.9	8.3	7.3	8.1	8.1
3.1 ≤ E < 3.3	6.2	6.4	7.7	8.1	7.1	7.9	7.9
3.3 ≤ E < 3.5	6.0	6.3	7.5	7.9	7.0	7.8	7.8
3.5 ≤ E < 3.7	5.9	6.1	7.4	7.8	6.9	7.6	7.6
3.7 ≤ E < 3.9	5.8	6.1	7.2	7.6	6.7	7.5	7.5
3.9 ≤ E < 4.1	5.8	6.0	7.1	7.5	6.6	7.4	7.3
4.1 ≤ E < 4.3	5.7	5.9	7.0	7.4	6.5	7.2	7.2
4.3 ≤ E < 4.5	5.6	5.8	6.9	7.2	6.4	7.1	7.1
4.5 ≤ E < 4.7	5.5	5.7	6.8	7.1	6.4	7.0	7.0
4.7 ≤ E < 4.9	5.5	5.7	6.7	7.0	6.3	6.9	6.9
E ≥ 4.9	5.4	5.6	6.6	6.9	6.2	6.9	6.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	53 < Assembly Average Burnup ≤ 54 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	6.6	6.8	8.3	8.8	7.6	8.6	8.6
3.1 ≤ E < 3.3	6.4	6.7	8.0	8.6	7.5	8.3	8.3
3.3 ≤ E < 3.5	6.3	6.5	7.9	8.3	7.3	8.2	8.1
3.5 ≤ E < 3.7	6.1	6.4	7.7	8.1	7.1	8.0	8.0
3.7 ≤ E < 3.9	6.0	6.3	7.6	8.0	7.0	7.9	7.8
3.9 ≤ E < 4.1	5.9	6.2	7.4	7.8	6.9	7.7	7.7
4.1 ≤ E < 4.3	5.9	6.1	7.3	7.7	6.8	7.6	7.6
4.3 ≤ E < 4.5	5.8	6.0	7.2	7.6	6.7	7.5	7.5
4.5 ≤ E < 4.7	5.7	5.9	7.0	7.5	6.6	7.4	7.3
4.7 ≤ E < 4.9	5.7	5.9	7.0	7.4	6.5	7.2	7.2
E ≥ 4.9	5.6	5.9	6.9	7.3	6.4	7.1	7.1

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	54 < Assembly Average Burnup ≤ 55 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	6.7	6.9	8.5	9.0	7.8	8.8	8.8
3.3 ≤ E < 3.5	6.6	6.8	8.3	8.8	7.6	8.6	8.6
3.5 ≤ E < 3.7	6.4	6.7	8.1	8.6	7.5	8.4	8.4
3.7 ≤ E < 3.9	6.3	6.6	7.9	8.4	7.3	8.2	8.2
3.9 ≤ E < 4.1	6.2	6.5	7.8	8.2	7.2	8.0	8.0
4.1 ≤ E < 4.3	6.1	6.3	7.6	8.1	7.0	7.9	7.9
4.3 ≤ E < 4.5	6.0	6.2	7.5	7.9	7.0	7.8	7.8
4.5 ≤ E < 4.7	5.9	6.1	7.4	7.8	6.9	7.7	7.7
4.7 ≤ E < 4.9	5.9	6.0	7.3	7.7	6.8	7.6	7.6
E ≥ 4.9	5.8	6.0	7.2	7.6	6.7	7.5	7.5

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	55 < Assembly Average Burnup ≤ 56 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	6.9	7.3	8.9	9.6	8.0	9.3	9.3
3.3 ≤ E < 3.5	6.8	7.1	8.7	9.3	7.8	9.0	9.0
3.5 ≤ E < 3.7	6.7	6.9	8.5	9.1	7.7	8.8	8.9
3.7 ≤ E < 3.9	6.6	6.8	8.3	8.9	7.5	8.7	8.7
3.9 ≤ E < 4.1	6.4	6.7	8.1	8.7	7.4	8.5	8.5
4.1 ≤ E < 4.3	6.3	6.6	8.0	8.5	7.2	8.3	8.3
4.3 ≤ E < 4.5	6.2	6.5	7.9	8.4	7.1	8.2	8.1
4.5 ≤ E < 4.7	6.1	6.4	7.7	8.2	7.0	8.0	8.0
4.7 ≤ E < 4.9	6.0	6.3	7.6	8.1	6.9	7.9	7.9
E ≥ 4.9	6.0	6.2	7.5	8.0	6.8	7.8	7.8

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	56 < Assembly Average Burnup ≤ 57 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	7.3	7.6	9.4	10.1	8.4	9.8	9.8
3.3 ≤ E < 3.5	7.1	7.4	9.2	9.9	8.2	9.6	9.6
3.5 ≤ E < 3.7	6.9	7.3	9.0	9.6	8.0	9.4	9.3
3.7 ≤ E < 3.9	6.8	7.1	8.8	9.4	7.9	9.1	9.1
3.9 ≤ E < 4.1	6.7	7.0	8.6	9.2	7.7	8.9	8.9
4.1 ≤ E < 4.3	6.6	6.9	8.4	9.0	7.6	8.8	8.8
4.3 ≤ E < 4.5	6.5	6.8	8.2	8.8	7.5	8.6	8.6
4.5 ≤ E < 4.7	6.4	6.7	8.1	8.7	7.3	8.5	8.4
4.7 ≤ E < 4.9	6.3	6.6	8.0	8.5	7.2	8.3	8.3
E ≥ 4.9	6.2	6.5	7.8	8.4	7.1	8.2	8.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	57 < Assembly Average Burnup ≤ 58 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	7.6	8.0	10.0	10.8	8.9	10.5	10.4
3.3 ≤ E < 3.5	7.4	7.8	9.7	10.5	8.7	10.2	10.1
3.5 ≤ E < 3.7	7.2	7.6	9.5	10.2	8.4	9.9	9.9
3.7 ≤ E < 3.9	7.1	7.5	9.3	9.9	8.2	9.7	9.6
3.9 ≤ E < 4.1	6.9	7.3	9.0	9.7	8.1	9.5	9.4
4.1 ≤ E < 4.3	6.8	7.1	8.8	9.5	7.9	9.2	9.2
4.3 ≤ E < 4.5	6.7	7.0	8.7	9.3	7.8	9.0	9.0
4.5 ≤ E < 4.7	6.6	6.9	8.5	9.1	7.7	8.9	8.9
4.7 ≤ E < 4.9	6.5	6.8	8.4	8.9	7.5	8.7	8.7
E ≥ 4.9	6.4	6.7	8.2	8.8	7.4	8.6	8.6

Table B2-18 Loading Table for PWR Fuel – 1,140 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	58 < Assembly Average Burnup ≤ 59 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	7.9	8.4	10.7	11.5	9.4	11.1	11.1
3.3 ≤ E < 3.5	7.8	8.2	10.3	11.2	9.1	10.8	10.8
3.5 ≤ E < 3.7	7.6	8.0	10.0	10.9	8.9	10.5	10.5
3.7 ≤ E < 3.9	7.4	7.8	9.8	10.6	8.7	10.2	10.2
3.9 ≤ E < 4.1	7.2	7.6	9.5	10.3	8.5	10.0	9.9
4.1 ≤ E < 4.3	7.1	7.5	9.3	10.0	8.3	9.8	9.7
4.3 ≤ E < 4.5	7.0	7.3	9.1	9.8	8.1	9.6	9.5
4.5 ≤ E < 4.7	6.9	7.2	8.9	9.6	8.0	9.4	9.4
4.7 ≤ E < 4.9	6.8	7.1	8.8	9.5	7.9	9.2	9.2
E ≥ 4.9	6.7	7.0	8.7	9.3	7.8	9.0	9.0
Initial Assembly Avg. Enrichment wt % ^{235}U (E)	59 < Assembly Average Burnup ≤ 60 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	-	-	-	-	-	-	-
3.3 ≤ E < 3.5	8.1	8.6	11.0	11.8	9.6	11.2	11.2
3.5 ≤ E < 3.7	7.9	8.4	10.7	11.5	9.4	10.9	10.8
3.7 ≤ E < 3.9	7.7	8.2	10.3	11.2	9.1	10.6	10.5
3.9 ≤ E < 4.1	7.6	8.0	10.1	11.0	8.9	10.3	10.3
4.1 ≤ E < 4.3	7.4	7.8	9.8	10.7	8.7	10.0	10.0
4.3 ≤ E < 4.5	7.3	7.7	9.6	10.4	8.5	9.8	9.8
4.5 ≤ E < 4.7	7.1	7.6	9.4	10.2	8.4	9.7	9.6
4.7 ≤ E < 4.9	7.0	7.4	9.2	10.0	8.2	9.5	9.4
E ≥ 4.9	6.9	7.3	9.1	9.8	8.1	9.3	9.3

Table B2-19 Loading Table for PWR Fuel – 922 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	30 < Assembly Average Burnup ≤ 32.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	4.2	4.3	4.8	4.9	4.6	4.9	4.9
2.3 ≤ E < 2.5	4.2	4.2	4.7	4.8	4.5	4.8	4.8
2.5 ≤ E < 2.7	4.1	4.2	4.7	4.8	4.5	4.8	4.8
2.7 ≤ E < 2.9	4.1	4.1	4.6	4.7	4.4	4.7	4.7
2.9 ≤ E < 3.1	4.0	4.1	4.6	4.7	4.4	4.7	4.7
3.1 ≤ E < 3.3	4.0	4.0	4.5	4.6	4.3	4.6	4.6
3.3 ≤ E < 3.5	4.0	4.0	4.5	4.6	4.3	4.6	4.6
3.5 ≤ E < 3.7	4.0	4.0	4.5	4.5	4.3	4.5	4.5
3.7 ≤ E < 3.9	4.0	4.0	4.4	4.5	4.2	4.5	4.5
3.9 ≤ E < 4.1	4.0	4.0	4.4	4.5	4.2	4.5	4.5
4.1 ≤ E < 4.3	4.0	4.0	4.4	4.5	4.2	4.4	4.4
4.3 ≤ E < 4.5	4.0	4.0	4.3	4.4	4.2	4.4	4.4
4.5 ≤ E < 4.7	4.0	4.0	4.3	4.4	4.1	4.4	4.4
4.7 ≤ E < 4.9	4.0	4.0	4.3	4.4	4.1	4.4	4.4
E ≥ 4.9	4.0	4.0	4.3	4.4	4.1	4.4	4.4

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	32.5 < Assembly Average Burnup ≤ 35 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.5	4.6	5.2	5.3	4.9	5.3	5.3
2.5 ≤ E < 2.7	4.4	4.5	5.1	5.3	4.9	5.2	5.2
2.7 ≤ E < 2.9	4.4	4.5	5.0	5.2	4.8	5.1	5.1
2.9 ≤ E < 3.1	4.4	4.4	5.0	5.1	4.8	5.1	5.1
3.1 ≤ E < 3.3	4.3	4.4	4.9	5.0	4.7	5.0	5.0
3.3 ≤ E < 3.5	4.3	4.3	4.9	5.0	4.7	5.0	5.0
3.5 ≤ E < 3.7	4.2	4.3	4.8	5.0	4.6	4.9	4.9
3.7 ≤ E < 3.9	4.2	4.3	4.8	4.9	4.6	4.9	4.9
3.9 ≤ E < 4.1	4.1	4.2	4.8	4.9	4.5	4.9	4.9
4.1 ≤ E < 4.3	4.1	4.2	4.7	4.9	4.5	4.8	4.8
4.3 ≤ E < 4.5	4.1	4.2	4.7	4.8	4.5	4.8	4.8
4.5 ≤ E < 4.7	4.0	4.1	4.7	4.8	4.5	4.8	4.8
4.7 ≤ E < 4.9	4.0	4.1	4.6	4.8	4.4	4.7	4.7
E ≥ 4.9	4.0	4.1	4.6	4.7	4.4	4.7	4.7

Table B2-19 Loading Table for PWR Fuel – 922 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	35 < Assembly Average Burnup ≤ 37.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.9	5.0	5.7	5.9	5.4	5.8	5.8
2.5 ≤ E < 2.7	4.8	4.9	5.7	5.8	5.3	5.7	5.7
2.7 ≤ E < 2.9	4.8	4.9	5.6	5.8	5.3	5.7	5.7
2.9 ≤ E < 3.1	4.7	4.8	5.5	5.7	5.2	5.6	5.6
3.1 ≤ E < 3.3	4.6	4.7	5.4	5.6	5.1	5.5	5.5
3.3 ≤ E < 3.5	4.6	4.7	5.4	5.6	5.0	5.5	5.5
3.5 ≤ E < 3.7	4.5	4.6	5.3	5.5	5.0	5.4	5.4
3.7 ≤ E < 3.9	4.5	4.6	5.3	5.4	5.0	5.4	5.4
3.9 ≤ E < 4.1	4.5	4.6	5.2	5.4	4.9	5.3	5.3
4.1 ≤ E < 4.3	4.4	4.5	5.2	5.4	4.9	5.3	5.3
4.3 ≤ E < 4.5	4.4	4.5	5.1	5.3	4.9	5.2	5.2
4.5 ≤ E < 4.7	4.4	4.5	5.1	5.3	4.8	5.2	5.2
4.7 ≤ E < 4.9	4.3	4.4	5.0	5.2	4.8	5.2	5.2
E ≥ 4.9	4.3	4.4	5.0	5.2	4.8	5.1	5.1

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	37.5 < Assembly Average Burnup ≤ 40 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.3	5.4	6.2	6.5	5.9	6.3	6.3
2.7 ≤ E < 2.9	5.2	5.3	6.1	6.4	5.8	6.2	6.2
2.9 ≤ E < 3.1	5.1	5.3	6.0	6.3	5.7	6.1	6.1
3.1 ≤ E < 3.3	5.0	5.2	6.0	6.2	5.6	6.0	6.0
3.3 ≤ E < 3.5	5.0	5.1	5.9	6.1	5.6	6.0	6.0
3.5 ≤ E < 3.7	4.9	5.0	5.9	6.0	5.5	5.9	5.9
3.7 ≤ E < 3.9	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.9 ≤ E < 4.1	4.8	5.0	5.7	5.9	5.4	5.8	5.8
4.1 ≤ E < 4.3	4.8	4.9	5.7	5.9	5.4	5.8	5.8
4.3 ≤ E < 4.5	4.8	4.9	5.7	5.8	5.3	5.8	5.7
4.5 ≤ E < 4.7	4.7	4.8	5.6	5.8	5.3	5.7	5.7
4.7 ≤ E < 4.9	4.7	4.8	5.6	5.8	5.2	5.7	5.7
E ≥ 4.9	4.6	4.8	5.5	5.7	5.2	5.6	5.6

Table B2-19 Loading Table for PWR Fuel – 922 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	40 < Assembly Average Burnup ≤ 41 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.5	5.6	6.6	6.8	6.0	6.6	6.6
2.7 ≤ E < 2.9	5.4	5.6	6.4	6.7	6.0	6.5	6.5
2.9 ≤ E < 3.1	5.3	5.5	6.3	6.6	5.9	6.4	6.4
3.1 ≤ E < 3.3	5.3	5.4	6.2	6.5	5.8	6.3	6.3
3.3 ≤ E < 3.5	5.2	5.3	6.1	6.4	5.8	6.3	6.2
3.5 ≤ E < 3.7	5.1	5.3	6.1	6.3	5.7	6.2	6.2
3.7 ≤ E < 3.9	5.0	5.2	6.0	6.2	5.7	6.1	6.1
3.9 ≤ E < 4.1	5.0	5.1	5.9	6.2	5.6	6.0	6.0
4.1 ≤ E < 4.3	5.0	5.1	5.9	6.1	5.6	6.0	6.0
4.3 ≤ E < 4.5	4.9	5.0	5.9	6.0	5.5	5.9	5.9
4.5 ≤ E < 4.7	4.9	5.0	5.8	6.0	5.5	5.9	5.9
4.7 ≤ E < 4.9	4.8	5.0	5.8	6.0	5.4	5.9	5.9
E ≥ 4.9	4.8	4.9	5.7	5.9	5.4	5.8	5.8

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	41 < Assembly Average Burnup ≤ 42 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.7	5.9	6.9	7.1	6.4	6.9	6.9
2.7 ≤ E < 2.9	5.6	5.8	6.7	7.0	6.2	6.8	6.8
2.9 ≤ E < 3.1	5.6	5.7	6.6	6.9	6.1	6.7	6.7
3.1 ≤ E < 3.3	5.5	5.6	6.5	6.8	6.0	6.6	6.6
3.3 ≤ E < 3.5	5.4	5.5	6.4	6.7	6.0	6.6	6.5
3.5 ≤ E < 3.7	5.3	5.5	6.4	6.6	5.9	6.5	6.5
3.7 ≤ E < 3.9	5.3	5.4	6.3	6.6	5.9	6.4	6.4
3.9 ≤ E < 4.1	5.2	5.4	6.2	6.5	5.8	6.3	6.3
4.1 ≤ E < 4.3	5.1	5.3	6.1	6.4	5.8	6.3	6.2
4.3 ≤ E < 4.5	5.1	5.2	6.0	6.3	5.7	6.2	6.2
4.5 ≤ E < 4.7	5.0	5.2	6.0	6.3	5.7	6.1	6.1
4.7 ≤ E < 4.9	5.0	5.1	6.0	6.2	5.6	6.1	6.1
E ≥ 4.9	4.9	5.1	5.9	6.2	5.6	6.0	6.0

Table B2-19 Loading Table for PWR Fuel – 922 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	42 < Assembly Average Burnup ≤ 43 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.9	6.1	7.2	7.5	6.7	7.3	7.3
2.7 ≤ E < 2.9	5.8	6.0	7.0	7.4	6.5	7.1	7.1
2.9 ≤ E < 3.1	5.8	5.9	6.9	7.3	6.4	7.0	7.0
3.1 ≤ E < 3.3	5.7	5.8	6.8	7.1	6.3	6.9	6.9
3.3 ≤ E < 3.5	5.6	5.8	6.7	7.0	6.2	6.8	6.8
3.5 ≤ E < 3.7	5.5	5.7	6.7	6.9	6.1	6.8	6.7
3.7 ≤ E < 3.9	5.5	5.6	6.6	6.8	6.1	6.7	6.7
3.9 ≤ E < 4.1	5.4	5.6	6.5	6.8	6.0	6.6	6.6
4.1 ≤ E < 4.3	5.3	5.5	6.4	6.7	6.0	6.5	6.5
4.3 ≤ E < 4.5	5.3	5.5	6.4	6.6	5.9	6.5	6.5
4.5 ≤ E < 4.7	5.2	5.4	6.3	6.6	5.9	6.4	6.4
4.7 ≤ E < 4.9	5.2	5.3	6.2	6.5	5.8	6.4	6.4
E ≥ 4.9	5.1	5.3	6.2	6.5	5.8	6.3	6.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	43 < Assembly Average Burnup ≤ 44 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.2	6.4	7.6	8.0	6.9	7.7	7.7
2.7 ≤ E < 2.9	6.0	6.2	7.4	7.8	6.8	7.5	7.5
2.9 ≤ E < 3.1	6.0	6.1	7.3	7.7	6.7	7.4	7.4
3.1 ≤ E < 3.3	5.9	6.0	7.2	7.5	6.6	7.3	7.3
3.3 ≤ E < 3.5	5.8	6.0	7.0	7.4	6.5	7.1	7.1
3.5 ≤ E < 3.7	5.8	5.9	6.9	7.3	6.4	7.0	7.0
3.7 ≤ E < 3.9	5.7	5.8	6.9	7.2	6.3	7.0	7.0
3.9 ≤ E < 4.1	5.6	5.8	6.8	7.1	6.3	6.9	6.9
4.1 ≤ E < 4.3	5.5	5.7	6.7	7.0	6.2	6.8	6.8
4.3 ≤ E < 4.5	5.5	5.7	6.7	6.9	6.1	6.8	6.8
4.5 ≤ E < 4.7	5.4	5.6	6.6	6.9	6.0	6.7	6.7
4.7 ≤ E < 4.9	5.4	5.6	6.5	6.8	6.0	6.6	6.6
E ≥ 4.9	5.3	5.5	6.5	6.8	6.0	6.6	6.6

Table B2-19 Loading Table for PWR Fuel – 922 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	44 < Assembly Average Burnup ≤ 45 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	6.3	6.6	7.8	8.3	7.1	7.9	7.9
2.9 ≤ E < 3.1	6.2	6.4	7.7	8.1	7.0	7.8	7.8
3.1 ≤ E < 3.3	6.1	6.3	7.6	7.9	6.9	7.7	7.7
3.3 ≤ E < 3.5	6.0	6.2	7.4	7.8	6.8	7.5	7.5
3.5 ≤ E < 3.7	5.9	6.1	7.3	7.7	6.7	7.4	7.4
3.7 ≤ E < 3.9	5.9	6.0	7.2	7.6	6.6	7.3	7.3
3.9 ≤ E < 4.1	5.8	6.0	7.1	7.5	6.6	7.2	7.2
4.1 ≤ E < 4.3	5.7	5.9	7.0	7.4	6.5	7.1	7.1
4.3 ≤ E < 4.5	5.7	5.9	6.9	7.3	6.4	7.0	7.0
4.5 ≤ E < 4.7	5.6	5.8	6.9	7.2	6.3	7.0	7.0
4.7 ≤ E < 4.9	5.6	5.8	6.8	7.1	6.3	6.9	6.9
E ≥ 4.9	5.5	5.7	6.7	7.0	6.2	6.9	6.9

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	45 < Assembly Average Burnup ≤ 46 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.1	7.4	9.2	9.8	8.2	9.3	9.3
2.9 ≤ E < 3.1	7.0	7.3	9.0	9.6	8.0	9.1	9.0
3.1 ≤ E < 3.3	6.9	7.1	8.8	9.4	7.9	8.9	8.9
3.3 ≤ E < 3.5	6.8	7.0	8.6	9.1	7.8	8.7	8.7
3.5 ≤ E < 3.7	6.7	6.9	8.5	9.0	7.6	8.6	8.6
3.7 ≤ E < 3.9	6.6	6.8	8.3	8.9	7.5	8.5	8.4
3.9 ≤ E < 4.1	6.5	6.7	8.2	8.7	7.4	8.3	8.3
4.1 ≤ E < 4.3	6.4	6.6	8.1	8.6	7.3	8.2	8.2
4.3 ≤ E < 4.5	6.3	6.6	8.0	8.5	7.2	8.1	8.1
4.5 ≤ E < 4.7	6.2	6.5	7.9	8.4	7.2	8.0	8.0
4.7 ≤ E < 4.9	6.2	6.4	7.8	8.3	7.1	8.0	7.9
E ≥ 4.9	6.1	6.4	7.7	8.2	7.0	7.9	7.9

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	46 < Assembly Average Burnup ≤ 47 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.5	7.8	9.8	10.5	8.7	9.9	9.9
2.9 ≤ E < 3.1	7.4	7.7	9.6	10.3	8.5	9.7	9.7
3.1 ≤ E < 3.3	7.2	7.5	9.3	10.0	8.3	9.5	9.5
3.3 ≤ E < 3.5	7.1	7.4	9.1	9.8	8.1	9.3	9.3
3.5 ≤ E < 3.7	7.0	7.2	9.0	9.6	8.0	9.1	9.1
3.7 ≤ E < 3.9	6.9	7.1	8.8	9.4	7.9	9.0	8.9
3.9 ≤ E < 4.1	6.8	7.0	8.7	9.3	7.8	8.8	8.8
4.1 ≤ E < 4.3	6.7	6.9	8.6	9.1	7.7	8.7	8.7
4.3 ≤ E < 4.5	6.6	6.9	8.4	9.0	7.6	8.6	8.6
4.5 ≤ E < 4.7	6.5	6.8	8.3	8.9	7.5	8.5	8.5
4.7 ≤ E < 4.9	6.5	6.7	8.2	8.8	7.5	8.4	8.4
E ≥ 4.9	6.4	6.7	8.1	8.7	7.4	8.3	8.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	47 < Assembly Average Burnup ≤ 48 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.9	8.3	10.5	11.3	9.2	10.7	10.6
2.9 ≤ E < 3.1	7.7	8.1	10.2	11.1	9.0	10.4	10.3
3.1 ≤ E < 3.3	7.6	7.9	10.0	10.8	8.8	10.1	10.1
3.3 ≤ E < 3.5	7.4	7.8	9.7	10.5	8.7	9.9	9.9
3.5 ≤ E < 3.7	7.3	7.6	9.6	10.3	8.5	9.7	9.7
3.7 ≤ E < 3.9	7.2	7.5	9.4	10.1	8.4	9.5	9.5
3.9 ≤ E < 4.1	7.0	7.4	9.2	9.9	8.2	9.4	9.4
4.1 ≤ E < 4.3	7.0	7.3	9.0	9.7	8.1	9.2	9.2
4.3 ≤ E < 4.5	6.9	7.2	8.9	9.6	8.0	9.1	9.1
4.5 ≤ E < 4.7	6.8	7.1	8.8	9.5	7.9	9.0	9.0
4.7 ≤ E < 4.9	6.7	7.0	8.7	9.4	7.8	8.9	8.9
E ≥ 4.9	6.7	6.9	8.6	9.2	7.7	8.8	8.8

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	48 < Assembly Average Burnup ≤ 49 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	8.4	8.8	11.3	12.1	9.9	11.4	11.4
2.9 ≤ E < 3.1	8.2	8.6	11.0	11.8	9.6	11.1	11.1
3.1 ≤ E < 3.3	8.0	8.4	10.7	11.6	9.4	10.9	10.8
3.3 ≤ E < 3.5	7.8	8.2	10.4	11.3	9.2	10.6	10.6
3.5 ≤ E < 3.7	7.7	8.0	10.2	11.1	9.0	10.4	10.4
3.7 ≤ E < 3.9	7.6	7.9	10.0	10.8	8.8	10.2	10.1
3.9 ≤ E < 4.1	7.4	7.8	9.8	10.6	8.7	10.0	9.9
4.1 ≤ E < 4.3	7.3	7.7	9.7	10.4	8.6	9.8	9.8
4.3 ≤ E < 4.5	7.2	7.6	9.5	10.3	8.4	9.7	9.7
4.5 ≤ E < 4.7	7.1	7.5	9.4	10.1	8.3	9.6	9.5
4.7 ≤ E < 4.9	7.0	7.4	9.2	10.0	8.2	9.4	9.4
E ≥ 4.9	6.9	7.3	9.1	9.8	8.1	9.3	9.3

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	49 < Assembly Average Burnup ≤ 50 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	8.7	8.9	11.8	12.7	10.2	11.9	11.9
3.1 ≤ E < 3.3	8.4	8.7	11.5	12.4	10.0	11.7	11.6
3.3 ≤ E < 3.5	8.2	8.5	11.2	12.1	9.8	11.4	11.4
3.5 ≤ E < 3.7	8.1	8.4	11.0	11.8	9.6	11.2	11.1
3.7 ≤ E < 3.9	7.9	8.2	10.7	11.6	9.4	10.9	10.9
3.9 ≤ E < 4.1	7.8	8.0	10.5	11.4	9.2	10.7	10.7
4.1 ≤ E < 4.3	7.7	7.9	10.3	11.2	9.0	10.5	10.5
4.3 ≤ E < 4.5	7.6	7.8	10.1	11.0	8.9	10.4	10.3
4.5 ≤ E < 4.7	7.5	7.7	9.9	10.9	8.8	10.2	10.1
4.7 ≤ E < 4.9	7.4	7.6	9.8	10.7	8.7	10.0	10.0
E ≥ 4.9	7.3	7.6	9.7	10.5	8.6	9.9	9.9

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	50 < Assembly Average Burnup ≤ 51 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	8.9	9.5	12.6	13.7	11.0	12.8	12.8
3.1 ≤ E < 3.3	8.7	9.3	12.2	13.3	10.7	12.5	12.4
3.3 ≤ E < 3.5	8.5	9.0	11.9	13.0	10.5	12.1	12.1
3.5 ≤ E < 3.7	8.4	8.8	11.7	12.7	10.2	11.9	11.9
3.7 ≤ E < 3.9	8.2	8.7	11.5	12.4	10.0	11.7	11.6
3.9 ≤ E < 4.1	8.0	8.5	11.2	12.2	9.8	11.5	11.4
4.1 ≤ E < 4.3	7.9	8.4	11.0	11.9	9.6	11.3	11.2
4.3 ≤ E < 4.5	7.8	8.2	10.9	11.8	9.5	11.1	11.0
4.5 ≤ E < 4.7	7.7	8.1	10.7	11.6	9.3	10.9	10.9
4.7 ≤ E < 4.9	7.6	8.0	10.5	11.4	9.2	10.8	10.7
E ≥ 4.9	7.5	7.9	10.4	11.3	9.1	10.6	10.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	51 < Assembly Average Burnup ≤ 52 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	9.5	10.1	13.5	14.3	11.7	13.7	13.7
3.1 ≤ E < 3.3	9.2	9.8	13.2	13.9	11.5	13.4	13.4
3.3 ≤ E < 3.5	9.0	9.6	12.8	13.6	11.2	13.1	13.0
3.5 ≤ E < 3.7	8.8	9.4	12.5	13.3	10.9	12.8	12.7
3.7 ≤ E < 3.9	8.7	9.2	12.2	13.0	10.7	12.5	12.4
3.9 ≤ E < 4.1	8.5	9.0	12.0	12.8	10.4	12.2	12.2
4.1 ≤ E < 4.3	8.3	8.9	11.8	12.5	10.2	12.0	11.9
4.3 ≤ E < 4.5	8.2	8.7	11.6	12.3	10.0	11.8	11.8
4.5 ≤ E < 4.7	8.1	8.6	11.4	12.1	9.9	11.6	11.6
4.7 ≤ E < 4.9	8.0	8.5	11.2	11.9	9.8	11.5	11.5
E ≥ 4.9	7.9	8.3	11.1	11.8	9.6	11.3	11.3

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	52 < Assembly Average Burnup ≤ 53 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	10.1	10.9	14.0	15.3	12.6	14.7	14.7
3.1 ≤ E < 3.3	9.8	10.5	13.7	14.9	12.2	14.3	14.3
3.3 ≤ E < 3.5	9.6	10.2	13.4	14.6	11.9	14.0	13.9
3.5 ≤ E < 3.7	9.3	10.0	13.1	14.2	11.6	13.7	13.6
3.7 ≤ E < 3.9	9.1	9.9	12.8	13.9	11.4	13.4	13.3
3.9 ≤ E < 4.1	8.9	9.6	12.5	13.7	11.2	13.1	13.1
4.1 ≤ E < 4.3	8.8	9.4	12.2	13.4	11.0	12.9	12.8
4.3 ≤ E < 4.5	8.7	9.2	12.0	13.2	10.8	12.6	12.6
4.5 ≤ E < 4.7	8.5	9.0	11.8	13.0	10.6	12.4	12.4
4.7 ≤ E < 4.9	8.4	8.9	11.7	12.8	10.4	12.2	12.2
E ≥ 4.9	8.3	8.8	11.5	12.6	10.2	12.0	12.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	53 < Assembly Average Burnup ≤ 54 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	10.8	11.6	15.1	16.4	13.5	15.7	15.6
3.1 ≤ E < 3.3	10.5	11.3	14.6	15.9	13.1	15.3	15.3
3.3 ≤ E < 3.5	10.1	11.0	14.2	15.6	12.7	14.9	14.9
3.5 ≤ E < 3.7	9.9	10.7	13.9	15.2	12.4	14.6	14.6
3.7 ≤ E < 3.9	9.7	10.4	13.6	14.9	12.1	14.3	14.2
3.9 ≤ E < 4.1	9.5	10.2	13.4	14.6	11.9	14.0	14.0
4.1 ≤ E < 4.3	9.3	9.9	13.1	14.3	11.7	13.7	13.7
4.3 ≤ E < 4.5	9.1	9.8	12.9	14.0	11.5	13.5	13.5
4.5 ≤ E < 4.7	9.0	9.6	12.6	13.8	11.3	13.3	13.3
4.7 ≤ E < 4.9	8.8	9.5	12.4	13.6	11.1	13.1	13.1
E ≥ 4.9	8.7	9.6	12.2	13.4	10.9	12.9	12.9

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	54 < Assembly Average Burnup ≤ 55 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	11.2	12.0	15.6	17.0	13.9	16.3	16.3
3.3 ≤ E < 3.5	10.9	11.7	15.2	16.6	13.6	15.9	15.9
3.5 ≤ E < 3.7	10.6	11.4	14.9	16.2	13.3	15.6	15.6
3.7 ≤ E < 3.9	10.3	11.2	14.5	15.9	13.0	15.3	15.3
3.9 ≤ E < 4.1	10.0	10.9	14.2	15.6	12.7	15.0	14.9
4.1 ≤ E < 4.3	9.9	10.7	13.9	15.3	12.4	14.7	14.6
4.3 ≤ E < 4.5	9.7	10.5	13.7	15.1	12.2	14.4	14.4
4.5 ≤ E < 4.7	9.5	10.2	13.5	14.8	12.0	14.1	14.1
4.7 ≤ E < 4.9	9.3	10.0	13.3	14.6	11.8	13.9	13.9
E ≥ 4.9	9.2	9.9	13.1	14.3	11.6	13.8	13.7

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	55 < Assembly Average Burnup ≤ 56 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	11.9	12.8	16.6	18.1	14.5	17.4	17.3
3.3 ≤ E < 3.5	11.5	12.5	16.2	17.6	14.1	17.0	16.9
3.5 ≤ E < 3.7	11.3	12.1	15.8	17.3	13.7	16.6	16.6
3.7 ≤ E < 3.9	11.0	11.8	15.5	17.0	13.4	16.3	16.2
3.9 ≤ E < 4.1	10.7	11.6	15.2	16.6	13.2	15.9	15.9
4.1 ≤ E < 4.3	10.5	11.3	14.9	16.3	12.9	15.7	15.6
4.3 ≤ E < 4.5	10.2	11.1	14.6	16.0	12.6	15.4	15.3
4.5 ≤ E < 4.7	10.0	10.9	14.3	15.8	12.4	15.2	15.1
4.7 ≤ E < 4.9	9.9	10.7	14.1	15.6	12.2	14.9	14.9
E ≥ 4.9	9.7	10.5	13.9	15.3	12.0	14.7	14.6

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	56 < Assembly Average Burnup ≤ 57 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	12.6	13.6	17.6	19.1	15.5	18.4	18.4
3.3 ≤ E < 3.5	12.3	13.3	17.2	18.7	15.0	18.0	18.0
3.5 ≤ E < 3.7	11.9	13.0	16.8	18.4	14.6	17.7	17.6
3.7 ≤ E < 3.9	11.7	12.6	16.5	18.0	14.3	17.3	17.3
3.9 ≤ E < 4.1	11.4	12.3	16.1	17.7	14.0	17.0	17.0
4.1 ≤ E < 4.3	11.2	12.0	15.8	17.4	13.7	16.7	16.7
4.3 ≤ E < 4.5	10.9	11.8	15.5	17.1	13.5	16.4	16.4
4.5 ≤ E < 4.7	10.7	11.6	15.3	16.8	13.2	16.1	16.1
4.7 ≤ E < 4.9	10.5	11.4	15.1	16.6	13.0	15.8	15.8
E ≥ 4.9	10.3	11.2	14.8	16.3	12.8	15.7	15.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	57 < Assembly Average Burnup ≤ 58 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	13.5	14.5	18.7	20.1	16.4	19.5	19.4
3.3 ≤ E < 3.5	13.1	14.1	18.3	19.8	15.9	19.1	19.0
3.5 ≤ E < 3.7	12.7	13.8	17.9	19.4	15.6	18.7	18.7
3.7 ≤ E < 3.9	12.4	13.4	17.5	19.0	15.3	18.4	18.3
3.9 ≤ E < 4.1	12.1	13.1	17.2	18.7	14.9	18.0	18.0
4.1 ≤ E < 4.3	11.8	12.9	16.9	18.4	14.6	17.7	17.7
4.3 ≤ E < 4.5	11.6	12.6	16.5	18.1	14.3	17.4	17.4
4.5 ≤ E < 4.7	11.4	12.3	16.3	17.8	14.0	17.2	17.1
4.7 ≤ E < 4.9	11.1	12.1	16.0	17.5	13.8	16.9	16.8
E ≥ 4.9	11.0	11.9	15.8	17.3	13.6	16.7	16.6

Table B2-20 Loading Table for PWR Fuel – 876 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	58 < Assembly Average Burnup ≤ 59 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	14.3	15.4	19.7	21.2	17.4	20.5	20.5
3.3 ≤ E < 3.5	13.9	15.0	19.3	20.8	16.9	20.1	20.1
3.5 ≤ E < 3.7	13.5	14.7	18.9	20.4	16.6	19.8	19.7
3.7 ≤ E < 3.9	13.2	14.3	18.5	20.1	16.1	19.4	19.4
3.9 ≤ E < 4.1	12.9	14.0	18.2	19.7	15.8	19.1	19.0
4.1 ≤ E < 4.3	12.6	13.7	17.8	19.4	15.5	18.8	18.7
4.3 ≤ E < 4.5	12.2	13.4	17.6	19.1	15.2	18.4	18.4
4.5 ≤ E < 4.7	12.0	13.1	17.3	18.9	14.9	18.2	18.1
4.7 ≤ E < 4.9	11.8	12.9	17.0	18.6	14.7	17.9	17.8
E ≥ 4.9	11.6	12.7	16.8	18.4	14.5	17.6	17.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	59 < Assembly Average Burnup ≤ 60 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	-	-	-	-	-	-	-
3.3 ≤ E < 3.5	14.7	15.9	20.2	21.9	17.9	20.7	20.6
3.5 ≤ E < 3.7	14.3	15.6	19.9	21.5	17.5	20.3	20.2
3.7 ≤ E < 3.9	13.9	15.2	19.5	21.1	17.1	19.9	19.9
3.9 ≤ E < 4.1	13.6	14.9	19.2	20.8	16.8	19.6	19.5
4.1 ≤ E < 4.3	13.3	14.5	18.8	20.5	16.4	19.3	19.2
4.3 ≤ E < 4.5	13.1	14.2	18.5	20.2	16.1	18.9	18.9
4.5 ≤ E < 4.7	12.8	13.9	18.2	19.9	15.8	18.7	18.6
4.7 ≤ E < 4.9	12.5	13.7	18.0	19.6	15.6	18.4	18.3
E ≥ 4.9	12.3	13.5	17.7	19.4	15.4	18.2	18.1

Table B2-21 Loading Table for PWR Fuel – 800 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	30 < Assembly Average Burnup ≤ 32.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14x14	WE 14x14	WE 15x15	B&W 15x15	CE 16x16	WE 17x17	B&W 17x17
2.1 ≤ E < 2.3	4.8	4.9	5.6	5.7	5.2	5.6	5.6
2.3 ≤ E < 2.5	4.7	4.8	5.5	5.7	5.2	5.6	5.6
2.5 ≤ E < 2.7	4.7	4.8	5.4	5.6	5.1	5.5	5.5
2.7 ≤ E < 2.9	4.6	4.7	5.4	5.5	5.0	5.5	5.5
2.9 ≤ E < 3.1	4.6	4.7	5.3	5.5	5.0	5.4	5.4
3.1 ≤ E < 3.3	4.5	4.6	5.3	5.4	5.0	5.3	5.3
3.3 ≤ E < 3.5	4.5	4.6	5.2	5.4	4.9	5.3	5.3
3.5 ≤ E < 3.7	4.5	4.5	5.1	5.3	4.9	5.2	5.2
3.7 ≤ E < 3.9	4.4	4.5	5.1	5.3	4.8	5.2	5.2
3.9 ≤ E < 4.1	4.4	4.5	5.0	5.2	4.8	5.2	5.1
4.1 ≤ E < 4.3	4.4	4.4	5.0	5.2	4.8	5.1	5.1
4.3 ≤ E < 4.5	4.3	4.4	5.0	5.1	4.8	5.1	5.1
4.5 ≤ E < 4.7	4.3	4.4	5.0	5.1	4.7	5.0	5.0
4.7 ≤ E < 4.9	4.3	4.4	4.9	5.1	4.7	5.0	5.0
E ≥ 4.9	4.3	4.3	4.9	5.0	4.7	5.0	5.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	32.5 < Assembly Average Burnup ≤ 35 GWd/MTU Minimum Cooling Time (years)						
	CE 14x14	WE 14x14	WE 15x15	B&W 15x15	CE 16x16	WE 17x17	B&W 17x17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	5.2	5.3	6.0	6.3	5.7	6.1	6.1
2.5 ≤ E < 2.7	5.1	5.2	6.0	6.2	5.7	6.0	6.0
2.7 ≤ E < 2.9	5.0	5.2	5.9	6.1	5.6	6.0	6.0
2.9 ≤ E < 3.1	5.0	5.1	5.9	6.0	5.5	5.9	5.9
3.1 ≤ E < 3.3	4.9	5.0	5.8	6.0	5.5	5.9	5.9
3.3 ≤ E < 3.5	4.9	5.0	5.8	5.9	5.4	5.8	5.8
3.5 ≤ E < 3.7	4.9	4.9	5.7	5.9	5.4	5.8	5.8
3.7 ≤ E < 3.9	4.8	4.9	5.7	5.8	5.3	5.8	5.8
3.9 ≤ E < 4.1	4.8	4.9	5.6	5.8	5.3	5.7	5.7
4.1 ≤ E < 4.3	4.7	4.8	5.6	5.8	5.2	5.7	5.7
4.3 ≤ E < 4.5	4.7	4.8	5.5	5.7	5.2	5.6	5.6
4.5 ≤ E < 4.7	4.7	4.8	5.5	5.7	5.2	5.6	5.6
4.7 ≤ E < 4.9	4.6	4.7	5.5	5.7	5.1	5.6	5.6
E ≥ 4.9	4.6	4.7	5.4	5.6	5.1	5.5	5.5

Table B2-21 Loading Table for PWR Fuel – 800 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	35 < Assembly Average Burnup ≤ 37.5 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	5.8	5.9	6.9	7.1	6.4	6.9	6.9
2.5 ≤ E < 2.7	5.7	5.8	6.8	7.0	6.3	6.8	6.8
2.7 ≤ E < 2.9	5.6	5.7	6.7	6.9	6.2	6.7	6.7
2.9 ≤ E < 3.1	5.5	5.7	6.6	6.8	6.1	6.7	6.7
3.1 ≤ E < 3.3	5.5	5.6	6.5	6.8	6.0	6.6	6.6
3.3 ≤ E < 3.5	5.4	5.5	6.4	6.7	6.0	6.5	6.5
3.5 ≤ E < 3.7	5.3	5.5	6.3	6.6	5.9	6.5	6.4
3.7 ≤ E < 3.9	5.3	5.4	6.3	6.5	5.9	6.4	6.4
3.9 ≤ E < 4.1	5.2	5.4	6.2	6.5	5.8	6.3	6.3
4.1 ≤ E < 4.3	5.2	5.3	6.1	6.4	5.8	6.3	6.3
4.3 ≤ E < 4.5	5.1	5.3	6.1	6.4	5.7	6.2	6.2
4.5 ≤ E < 4.7	5.1	5.2	6.0	6.3	5.7	6.2	6.2
4.7 ≤ E < 4.9	5.0	5.2	6.0	6.3	5.7	6.1	6.1
E ≥ 4.9	5.0	5.1	6.0	6.2	5.6	6.1	6.1

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	37.5 < Assembly Average Burnup ≤ 40 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.3	6.5	7.7	8.1	7.0	7.8	7.8
2.7 ≤ E < 2.9	6.2	6.4	7.6	8.0	6.9	7.7	7.7
2.9 ≤ E < 3.1	6.1	6.3	7.5	7.8	6.9	7.6	7.6
3.1 ≤ E < 3.3	6.0	6.2	7.4	7.7	6.8	7.4	7.4
3.3 ≤ E < 3.5	5.9	6.1	7.2	7.6	6.7	7.3	7.3
3.5 ≤ E < 3.7	5.9	6.0	7.1	7.5	6.6	7.3	7.2
3.7 ≤ E < 3.9	5.8	6.0	7.1	7.4	6.5	7.2	7.1
3.9 ≤ E < 4.1	5.8	5.9	7.0	7.4	6.5	7.1	7.1
4.1 ≤ E < 4.3	5.7	5.9	6.9	7.3	6.4	7.0	7.0
4.3 ≤ E < 4.5	5.7	5.8	6.9	7.2	6.4	7.0	7.0
4.5 ≤ E < 4.7	5.6	5.8	6.8	7.1	6.3	6.9	6.9
4.7 ≤ E < 4.9	5.6	5.7	6.8	7.1	6.3	6.9	6.9
E ≥ 4.9	5.5	5.7	6.7	7.0	6.2	6.8	6.8

Table B2-21 Loading Table for PWR Fuel – 800 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	40 < Assembly Average Burnup ≤ 41 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.6	6.8	8.2	8.7	7.4	8.3	8.3
2.7 ≤ E < 2.9	6.5	6.7	8.0	8.5	7.3	8.1	8.1
2.9 ≤ E < 3.1	6.4	6.6	7.9	8.3	7.2	8.0	8.0
3.1 ≤ E < 3.3	6.3	6.5	7.8	8.2	7.1	7.9	7.9
3.3 ≤ E < 3.5	6.2	6.4	7.7	8.0	7.0	7.8	7.8
3.5 ≤ E < 3.7	6.1	6.3	7.6	8.0	6.9	7.7	7.7
3.7 ≤ E < 3.9	6.0	6.2	7.5	7.9	6.8	7.6	7.6
3.9 ≤ E < 4.1	6.0	6.1	7.4	7.8	6.8	7.5	7.5
4.1 ≤ E < 4.3	5.9	6.1	7.3	7.7	6.7	7.4	7.4
4.3 ≤ E < 4.5	5.9	6.0	7.2	7.6	6.7	7.4	7.3
4.5 ≤ E < 4.7	5.8	6.0	7.1	7.6	6.6	7.3	7.3
4.7 ≤ E < 4.9	5.8	5.9	7.1	7.5	6.6	7.2	7.2
E ≥ 4.9	5.7	5.9	7.0	7.4	6.5	7.2	7.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	41 < Assembly Average Burnup ≤ 42 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.9	7.1	8.7	9.3	7.8	8.8	8.8
2.7 ≤ E < 2.9	6.8	7.0	8.6	9.0	7.7	8.6	8.6
2.9 ≤ E < 3.1	6.7	6.9	8.4	8.9	7.6	8.5	8.5
3.1 ≤ E < 3.3	6.6	6.8	8.2	8.7	7.5	8.3	8.3
3.3 ≤ E < 3.5	6.5	6.7	8.1	8.6	7.3	8.2	8.2
3.5 ≤ E < 3.7	6.4	6.6	8.0	8.5	7.2	8.1	8.1
3.7 ≤ E < 3.9	6.3	6.5	7.9	8.3	7.1	8.0	8.0
3.9 ≤ E < 4.1	6.2	6.5	7.8	8.2	7.1	7.9	7.9
4.1 ≤ E < 4.3	6.1	6.4	7.7	8.1	7.0	7.8	7.8
4.3 ≤ E < 4.5	6.1	6.3	7.6	8.0	6.9	7.8	7.7
4.5 ≤ E < 4.7	6.0	6.3	7.6	8.0	6.9	7.7	7.7
4.7 ≤ E < 4.9	6.0	6.2	7.5	7.9	6.8	7.6	7.6
E ≥ 4.9	5.9	6.1	7.4	7.8	6.8	7.6	7.6

Table B2-21 Loading Table for PWR Fuel – 800 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	42 < Assembly Average Burnup ≤ 43 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	7.3	7.5	9.3	9.9	8.3	9.4	9.4
2.7 ≤ E < 2.9	7.1	7.4	9.1	9.7	8.1	9.2	9.2
2.9 ≤ E < 3.1	7.0	7.2	8.9	9.5	8.0	9.0	9.0
3.1 ≤ E < 3.3	6.9	7.1	8.8	9.3	7.9	8.9	8.8
3.3 ≤ E < 3.5	6.8	7.0	8.6	9.2	7.8	8.7	8.7
3.5 ≤ E < 3.7	6.7	6.9	8.5	9.0	7.7	8.6	8.6
3.7 ≤ E < 3.9	6.6	6.8	8.4	8.9	7.6	8.5	8.5
3.9 ≤ E < 4.1	6.5	6.8	8.2	8.8	7.5	8.4	8.4
4.1 ≤ E < 4.3	6.5	6.7	8.1	8.7	7.4	8.3	8.3
4.3 ≤ E < 4.5	6.4	6.6	8.0	8.6	7.3	8.2	8.2
4.5 ≤ E < 4.7	6.3	6.6	8.0	8.5	7.2	8.1	8.1
4.7 ≤ E < 4.9	6.2	6.5	7.9	8.4	7.2	8.0	8.0
E ≥ 4.9	6.2	6.4	7.8	8.3	7.1	8.0	8.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	43 < Assembly Average Burnup ≤ 44 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	7.7	8.0	10.0	10.8	8.8	10.0	10.1
2.7 ≤ E < 2.9	7.5	7.8	9.7	10.5	8.7	9.9	9.8
2.9 ≤ E < 3.1	7.4	7.7	9.5	10.2	8.5	9.7	9.6
3.1 ≤ E < 3.3	7.2	7.5	9.3	10.0	8.3	9.5	9.4
3.3 ≤ E < 3.5	7.1	7.4	9.2	9.8	8.2	9.3	9.3
3.5 ≤ E < 3.7	7.1	7.3	9.0	9.7	8.0	9.1	9.1
3.7 ≤ E < 3.9	6.9	7.2	8.9	9.5	8.0	9.0	9.0
3.9 ≤ E < 4.1	6.8	7.1	8.8	9.4	7.9	8.9	8.9
4.1 ≤ E < 4.3	6.7	7.0	8.7	9.2	7.8	8.8	8.8
4.3 ≤ E < 4.5	6.7	6.9	8.5	9.1	7.7	8.7	8.7
4.5 ≤ E < 4.7	6.6	6.9	8.5	9.0	7.6	8.6	8.6
4.7 ≤ E < 4.9	6.6	6.8	8.4	8.9	7.6	8.5	8.5
E ≥ 4.9	6.5	6.8	8.3	8.9	7.5	8.5	8.4

Table B2-21 Loading Table for PWR Fuel – 800 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	44 < Assembly Average Burnup ≤ 45 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.9	8.2	10.5	11.4	9.2	10.6	10.6
2.9 ≤ E < 3.1	7.8	8.1	10.2	11.1	9.0	10.4	10.4
3.1 ≤ E < 3.3	7.6	7.9	10.0	10.8	8.8	10.1	10.1
3.3 ≤ E < 3.5	7.5	7.8	9.8	10.6	8.7	9.9	9.9
3.5 ≤ E < 3.7	7.3	7.7	9.6	10.4	8.6	9.8	9.8
3.7 ≤ E < 3.9	7.2	7.6	9.5	10.2	8.4	9.6	9.6
3.9 ≤ E < 4.1	7.1	7.5	9.3	10.0	8.3	9.5	9.5
4.1 ≤ E < 4.3	7.0	7.4	9.2	9.9	8.2	9.4	9.3
4.3 ≤ E < 4.5	7.0	7.3	9.1	9.8	8.1	9.2	9.2
4.5 ≤ E < 4.7	6.9	7.2	9.0	9.7	8.0	9.1	9.1
4.7 ≤ E < 4.9	6.8	7.1	8.9	9.6	7.9	9.0	9.0
E ≥ 4.9	6.8	7.0	8.8	9.5	7.9	9.0	8.9

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	45 < Assembly Average Burnup ≤ 46 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	9.2	9.8	12.8	13.9	11.2	13.0	13.0
2.9 ≤ E < 3.1	9.0	9.6	12.5	13.6	10.9	12.7	12.7
3.1 ≤ E < 3.3	8.9	9.4	12.1	13.3	10.6	12.4	12.4
3.3 ≤ E < 3.5	8.7	9.1	11.9	13.0	10.4	12.1	12.1
3.5 ≤ E < 3.7	8.6	9.0	11.8	12.8	10.2	11.9	11.9
3.7 ≤ E < 3.9	8.4	8.8	11.6	12.5	10.0	11.8	11.7
3.9 ≤ E < 4.1	8.3	8.7	11.4	12.3	9.9	11.6	11.5
4.1 ≤ E < 4.3	8.1	8.6	11.2	12.2	9.7	11.4	11.4
4.3 ≤ E < 4.5	8.0	8.5	11.1	12.0	9.6	11.3	11.3
4.5 ≤ E < 4.7	7.9	8.4	10.9	11.9	9.5	11.2	11.1
4.7 ≤ E < 4.9	7.9	8.3	10.8	11.7	9.4	11.0	11.0
E ≥ 4.9	7.8	8.2	10.7	11.6	9.3	10.9	10.9

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	46 < Assembly Average Burnup ≤ 47 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	9.9	10.6	13.8	15.0	12.0	13.9	13.9
2.9 ≤ E < 3.1	9.7	10.3	13.5	14.7	11.7	13.7	13.7
3.1 ≤ E < 3.3	9.4	10.0	13.2	14.4	11.4	13.4	13.4
3.3 ≤ E < 3.5	9.2	9.8	12.9	14.0	11.2	13.1	13.1
3.5 ≤ E < 3.7	9.0	9.6	12.7	13.8	11.0	12.9	12.8
3.7 ≤ E < 3.9	8.9	9.4	12.4	13.6	10.8	12.6	12.6
3.9 ≤ E < 4.1	8.8	9.3	12.2	13.4	10.6	12.5	12.4
4.1 ≤ E < 4.3	8.6	9.1	12.0	13.2	10.4	12.2	12.2
4.3 ≤ E < 4.5	8.5	9.0	11.8	13.0	10.3	12.1	12.0
4.5 ≤ E < 4.7	8.4	8.9	11.7	12.8	10.1	11.9	11.9
4.7 ≤ E < 4.9	8.3	8.8	11.6	12.7	10.0	11.8	11.8
E ≥ 4.9	8.2	8.7	11.5	12.5	9.9	11.7	11.7

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	47 < Assembly Average Burnup ≤ 48 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	10.6	11.4	14.9	16.1	12.9	15.1	15.1
2.9 ≤ E < 3.1	10.4	11.1	14.5	15.8	12.5	14.7	14.7
3.1 ≤ E < 3.3	10.0	10.8	14.1	15.5	12.2	14.4	14.4
3.3 ≤ E < 3.5	9.9	10.5	13.9	15.2	12.0	14.1	14.0
3.5 ≤ E < 3.7	9.6	10.3	13.6	14.9	11.8	13.8	13.8
3.7 ≤ E < 3.9	9.5	10.1	13.4	14.6	11.6	13.6	13.6
3.9 ≤ E < 4.1	9.3	9.9	13.2	14.4	11.4	13.4	13.4
4.1 ≤ E < 4.3	9.1	9.8	13.0	14.1	11.2	13.2	13.2
4.3 ≤ E < 4.5	9.0	9.6	12.8	14.0	11.1	13.0	13.0
4.5 ≤ E < 4.7	8.9	9.5	12.6	13.8	10.9	12.9	12.8
4.7 ≤ E < 4.9	8.8	9.3	12.4	13.6	10.8	12.7	12.7
E ≥ 4.9	8.7	9.2	12.3	13.5	10.7	12.5	12.5

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	48 < Assembly Average Burnup ≤ 49 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	11.4	12.2	16.0	17.3	13.9	16.2	16.2
2.9 ≤ E < 3.1	11.1	11.8	15.6	17.0	13.5	15.8	15.8
3.1 ≤ E < 3.3	10.8	11.6	15.3	16.6	13.2	15.5	15.5
3.3 ≤ E < 3.5	10.6	11.3	14.9	16.3	12.9	15.2	15.2
3.5 ≤ E < 3.7	10.3	11.1	14.7	16.0	12.7	14.9	14.9
3.7 ≤ E < 3.9	10.1	10.9	14.4	15.7	12.4	14.6	14.6
3.9 ≤ E < 4.1	9.9	10.7	14.1	15.5	12.1	14.4	14.4
4.1 ≤ E < 4.3	9.7	10.4	13.9	15.2	12.0	14.1	14.1
4.3 ≤ E < 4.5	9.6	10.2	13.7	15.0	11.8	13.9	13.9
4.5 ≤ E < 4.7	9.5	10.1	13.5	14.9	11.7	13.8	13.8
4.7 ≤ E < 4.9	9.3	9.9	13.4	14.6	11.5	13.6	13.6
E ≥ 4.9	9.2	9.8	13.2	14.5	11.4	13.5	13.5

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	49 < Assembly Average Burnup ≤ 50 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	11.9	12.4	16.8	18.2	14.5	17.0	17.0
3.1 ≤ E < 3.3	11.6	12.1	16.4	17.8	14.1	16.6	16.6
3.3 ≤ E < 3.5	11.3	11.8	16.0	17.5	13.8	16.3	16.2
3.5 ≤ E < 3.7	11.1	11.6	15.7	17.2	13.6	16.0	16.0
3.7 ≤ E < 3.9	10.8	11.4	15.5	16.9	13.3	15.7	15.7
3.9 ≤ E < 4.1	10.6	11.2	15.2	16.6	13.1	15.5	15.5
4.1 ≤ E < 4.3	10.4	11.0	14.9	16.3	12.9	15.3	15.2
4.3 ≤ E < 4.5	10.2	10.8	14.7	16.1	12.7	15.0	15.0
4.5 ≤ E < 4.7	10.1	10.6	14.5	15.9	12.5	14.9	14.8
4.7 ≤ E < 4.9	9.9	10.5	14.3	15.7	12.3	14.6	14.6
E ≥ 4.9	9.8	10.3	14.1	15.5	12.2	14.5	14.5

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ²³⁵U (E)	50 < Assembly Average Burnup ≤ 51 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	12.4	13.4	17.8	19.3	15.6	18.1	18.1
3.1 ≤ E < 3.3	12.1	13.1	17.5	19.0	15.2	17.8	17.8
3.3 ≤ E < 3.5	11.8	12.7	17.2	18.7	14.9	17.4	17.4
3.5 ≤ E < 3.7	11.5	12.4	16.8	18.3	14.5	17.2	17.1
3.7 ≤ E < 3.9	11.3	12.1	16.5	18.0	14.3	16.9	16.8
3.9 ≤ E < 4.1	11.1	11.9	16.2	17.7	14.0	16.6	16.5
4.1 ≤ E < 4.3	10.9	11.7	16.0	17.5	13.8	16.3	16.3
4.3 ≤ E < 4.5	10.7	11.5	15.8	17.3	13.6	16.1	16.0
4.5 ≤ E < 4.7	10.5	11.4	15.5	17.1	13.4	15.8	15.9
4.7 ≤ E < 4.9	10.4	11.2	15.3	16.8	13.2	15.7	15.7
E ≥ 4.9	10.2	11.1	15.2	16.7	13.1	15.5	15.5

Initial Assembly Avg. Enrichment wt % ²³⁵U (E)	51 < Assembly Average Burnup ≤ 52 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	13.3	14.3	19.0	20.1	16.7	19.4	19.3
3.1 ≤ E < 3.3	12.9	14.0	18.6	19.7	16.3	19.0	18.9
3.3 ≤ E < 3.5	12.6	13.6	18.2	19.4	15.9	18.6	18.6
3.5 ≤ E < 3.7	12.3	13.3	17.9	19.1	15.6	18.3	18.3
3.7 ≤ E < 3.9	12.0	13.1	17.6	18.8	15.3	18.0	17.9
3.9 ≤ E < 4.1	11.8	12.8	17.4	18.5	15.0	17.7	17.7
4.1 ≤ E < 4.3	11.6	12.5	17.1	18.2	14.8	17.5	17.4
4.3 ≤ E < 4.5	11.4	12.3	16.8	18.0	14.5	17.3	17.2
4.5 ≤ E < 4.7	11.2	12.1	16.6	17.7	14.4	17.0	17.0
4.7 ≤ E < 4.9	11.1	11.9	16.4	17.5	14.1	16.8	16.8
E ≥ 4.9	10.9	11.8	16.2	17.4	13.9	16.6	16.5

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	52 < Assembly Average Burnup ≤ 53 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	14.2	15.3	19.7	21.3	17.8	20.5	20.5
3.1 ≤ E < 3.3	13.8	15.0	19.3	20.9	17.4	20.1	20.1
3.3 ≤ E < 3.5	13.5	14.6	18.9	20.6	17.1	19.8	19.7
3.5 ≤ E < 3.7	13.1	14.3	18.6	20.3	16.7	19.5	19.4
3.7 ≤ E < 3.9	12.9	14.2	18.3	19.9	16.4	19.2	19.1
3.9 ≤ E < 4.1	12.6	13.7	18.0	19.6	16.0	18.9	18.8
4.1 ≤ E < 4.3	12.3	13.5	17.7	19.4	15.8	18.6	18.5
4.3 ≤ E < 4.5	12.1	13.2	17.5	19.1	15.6	18.4	18.3
4.5 ≤ E < 4.7	11.9	13.0	17.3	18.8	15.3	18.2	18.1
4.7 ≤ E < 4.9	11.8	12.8	17.0	18.7	15.2	17.9	17.8
E ≥ 4.9	11.6	12.6	16.9	18.5	14.9	17.7	17.7

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	53 < Assembly Average Burnup ≤ 54 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	15.2	16.4	20.9	22.5	18.9	21.7	21.6
3.1 ≤ E < 3.3	14.8	16.0	20.4	22.1	18.5	21.3	21.3
3.3 ≤ E < 3.5	14.4	15.6	20.0	21.8	18.1	21.0	20.9
3.5 ≤ E < 3.7	14.0	15.2	19.7	21.4	17.7	20.6	20.6
3.7 ≤ E < 3.9	13.7	14.9	19.4	21.1	17.4	20.3	20.3
3.9 ≤ E < 4.1	13.4	14.6	19.1	20.8	17.2	20.1	20.0
4.1 ≤ E < 4.3	13.2	14.4	18.9	20.5	16.9	19.8	19.7
4.3 ≤ E < 4.5	12.9	14.1	18.6	20.3	16.6	19.5	19.5
4.5 ≤ E < 4.7	12.7	13.9	18.3	20.1	16.4	19.3	19.2
4.7 ≤ E < 4.9	12.5	13.6	18.1	19.8	16.1	19.0	19.0
E ≥ 4.9	12.4	13.9	17.9	19.6	15.9	18.8	18.8

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	54 < Assembly Average Burnup ≤ 55 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	15.7	17.1	21.6	23.2	19.6	22.5	22.4
3.3 ≤ E < 3.5	15.4	17.7	21.2	22.9	19.2	22.1	22.1
3.5 ≤ E < 3.7	15.0	16.3	20.9	22.6	18.9	21.8	21.8
3.7 ≤ E < 3.9	14.6	16.0	20.6	22.2	18.5	21.5	21.5
3.9 ≤ E < 4.1	14.4	15.7	20.2	21.9	18.3	21.2	21.2
4.1 ≤ E < 4.3	14.1	15.4	19.9	21.7	18.0	20.9	20.9
4.3 ≤ E < 4.5	13.8	15.1	19.7	21.4	17.7	20.7	20.6
4.5 ≤ E < 4.7	13.6	14.9	19.4	21.2	17.5	20.5	20.4
4.7 ≤ E < 4.9	13.4	14.6	19.2	21.0	17.2	20.2	20.1
E ≥ 4.9	13.2	14.4	19.0	20.7	17.0	19.9	19.9

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	55 < Assembly Average Burnup ≤ 56 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	16.8	18.1	22.7	24.4	20.2	23.6	23.6
3.3 ≤ E < 3.5	16.3	17.7	22.4	24.1	19.8	23.3	23.3
3.5 ≤ E < 3.7	15.9	17.3	21.9	23.7	19.5	23.0	22.9
3.7 ≤ E < 3.9	15.6	17.0	21.7	23.4	19.2	22.6	22.6
3.9 ≤ E < 4.1	15.3	16.7	21.4	23.1	18.8	22.4	22.3
4.1 ≤ E < 4.3	15.0	16.4	21.0	22.9	18.5	22.1	22.0
4.3 ≤ E < 4.5	14.8	16.1	20.8	22.6	18.3	21.8	21.8
4.5 ≤ E < 4.7	14.5	15.8	20.5	22.4	17.9	21.6	21.5
4.7 ≤ E < 4.9	14.3	15.6	20.3	22.2	17.8	21.3	21.3
E ≥ 4.9	14.0	15.4	20.0	21.9	17.6	21.1	21.1

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	56 < Assembly Average Burnup ≤ 57 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	17.7	19.2	23.8	25.6	21.3	24.7	24.7
3.3 ≤ E < 3.5	17.3	18.8	23.4	25.2	20.9	24.4	24.4
3.5 ≤ E < 3.7	16.9	18.4	23.1	24.9	20.5	24.0	24.0
3.7 ≤ E < 3.9	16.6	18.1	22.7	24.6	20.2	23.7	23.7
3.9 ≤ E < 4.1	16.2	17.7	22.4	24.3	19.9	23.5	23.5
4.1 ≤ E < 4.3	15.9	17.4	22.2	24.0	19.6	23.2	23.2
4.3 ≤ E < 4.5	15.7	17.1	21.9	23.8	19.3	23.0	22.9
4.5 ≤ E < 4.7	15.4	16.8	21.6	23.5	19.1	22.7	22.6
4.7 ≤ E < 4.9	15.2	16.6	21.4	23.3	18.8	22.5	22.4
E ≥ 4.9	15.0	16.4	21.2	23.0	18.6	22.2	22.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	57 < Assembly Average Burnup ≤ 58 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	18.8	20.2	24.9	26.7	22.3	25.8	25.8
3.3 ≤ E < 3.5	18.3	19.9	24.6	26.3	22.0	25.5	25.5
3.5 ≤ E < 3.7	17.9	19.5	24.2	26.0	21.6	25.2	25.2
3.7 ≤ E < 3.9	17.6	19.1	23.9	25.7	21.3	24.9	24.8
3.9 ≤ E < 4.1	17.3	18.8	23.6	25.4	20.9	24.6	24.6
4.1 ≤ E < 4.3	16.9	18.4	23.3	25.1	20.6	24.4	24.3
4.3 ≤ E < 4.5	16.6	18.1	23.0	24.9	20.4	24.1	24.0
4.5 ≤ E < 4.7	16.3	17.9	22.8	24.6	20.0	23.8	23.8
4.7 ≤ E < 4.9	16.1	17.6	22.5	24.4	19.9	23.6	23.6
E ≥ 4.9	15.8	17.4	22.3	24.2	19.7	23.4	23.3

Table B2-22 Loading Table for PWR Fuel – 760 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	58 < Assembly Average Burnup ≤ 59 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	19.8	21.3	25.9	27.7	23.4	26.9	26.9
3.3 ≤ E < 3.5	19.3	20.9	25.6	27.4	23.0	26.7	26.6
3.5 ≤ E < 3.7	18.9	20.5	25.3	27.1	22.7	26.3	26.2
3.7 ≤ E < 3.9	18.6	20.2	24.9	26.8	22.3	26.0	25.9
3.9 ≤ E < 4.1	18.2	19.8	24.6	26.5	22.0	25.7	25.7
4.1 ≤ E < 4.3	17.9	19.5	24.3	26.2	21.7	25.5	25.4
4.3 ≤ E < 4.5	17.6	19.2	24.1	26.0	21.4	25.2	25.2
4.5 ≤ E < 4.7	17.3	18.9	23.9	25.8	21.2	25.0	24.9
4.7 ≤ E < 4.9	17.1	18.7	23.6	25.5	20.9	24.7	24.7
E ≥ 4.9	16.8	18.4	23.4	25.3	20.7	24.5	24.4

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	59 < Assembly Average Burnup ≤ 60 GWd/MTU Minimum Cooling Time (years)						
	CE 14×14	WE 14×14	WE 15×15	B&W 15×15	CE 16×16	WE 17×17	B&W 17×17
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	-	-	-	-	-	-	-
3.3 ≤ E < 3.5	20.3	22.0	26.7	28.4	24.1	27.2	27.1
3.5 ≤ E < 3.7	20.0	21.5	26.4	28.1	23.7	26.8	26.7
3.7 ≤ E < 3.9	19.6	21.2	26.0	27.8	23.4	26.5	26.5
3.9 ≤ E < 4.1	19.3	20.8	25.7	27.6	23.1	26.2	26.2
4.1 ≤ E < 4.3	18.9	20.5	25.4	27.3	22.7	26.0	25.9
4.3 ≤ E < 4.5	18.6	20.2	25.2	27.1	22.5	25.7	25.6
4.5 ≤ E < 4.7	18.3	20.0	24.9	26.8	22.2	25.5	25.4
4.7 ≤ E < 4.9	18.0	19.7	24.7	26.6	22.0	25.2	25.2
E ≥ 4.9	17.7	19.5	24.4	26.4	21.7	25.0	24.9

Table B2-23 Loading Table for BWR Fuel – 379 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	30 < Assembly Average Burnup ≤ 32.5 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	4.3	4.6	4.0	4.5	4.0	4.5	4.4
2.3 ≤ E < 2.5	4.2	4.6	4.0	4.5	4.0	4.4	4.4
2.5 ≤ E < 2.7	4.2	4.5	4.0	4.4	4.0	4.4	4.3
2.7 ≤ E < 2.9	4.1	4.5	4.0	4.4	4.0	4.3	4.3
2.9 ≤ E < 3.1	4.1	4.4	4.0	4.3	4.0	4.3	4.2
3.1 ≤ E < 3.3	4.0	4.4	4.0	4.3	4.0	4.2	4.2
3.3 ≤ E < 3.5	4.0	4.3	4.0	4.2	4.0	4.2	4.1
3.5 ≤ E < 3.7	4.0	4.3	4.0	4.2	4.0	4.2	4.1
3.7 ≤ E < 3.9	4.0	4.3	4.0	4.2	4.0	4.1	4.0
3.9 ≤ E < 4.1	4.0	4.2	4.0	4.1	4.0	4.1	4.0
4.1 ≤ E < 4.3	4.0	4.2	4.0	4.1	4.0	4.1	4.0
4.3 ≤ E < 4.5	4.0	4.2	4.0	4.1	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.1	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.1	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.1	4.0	4.0	4.0	4.0	4.0

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	32.5 < Assembly Average Burnup ≤ 35 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.7	5.0	4.3	4.9	4.0	4.9	4.8
2.5 ≤ E < 2.7	4.6	4.9	4.3	4.8	4.0	4.8	4.7
2.7 ≤ E < 2.9	4.5	4.9	4.2	4.8	4.0	4.7	4.6
2.9 ≤ E < 3.1	4.5	4.8	4.2	4.7	4.0	4.7	4.6
3.1 ≤ E < 3.3	4.4	4.8	4.1	4.7	4.0	4.6	4.5
3.3 ≤ E < 3.5	4.4	4.7	4.0	4.6	4.0	4.6	4.5
3.5 ≤ E < 3.7	4.3	4.7	4.0	4.6	4.0	4.5	4.5
3.7 ≤ E < 3.9	4.3	4.6	4.0	4.5	4.0	4.5	4.4
3.9 ≤ E < 4.1	4.2	4.6	4.0	4.5	4.0	4.5	4.4
4.1 ≤ E < 4.3	4.2	4.5	4.0	4.5	4.0	4.4	4.3
4.3 ≤ E < 4.5	4.2	4.5	4.0	4.4	4.0	4.4	4.3
4.5 ≤ E < 4.7	4.1	4.5	4.0	4.4	4.0	4.4	4.3
4.7 ≤ E < 4.9	4.1	4.5	4.0	4.4	4.0	4.3	4.2
E ≥ 4.9	4.1	4.4	4.0	4.3	4.0	4.3	4.2

Table B2-23 Loading Table for BWR Fuel – 379 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	35 < Assembly Average Burnup ≤ 37.5 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	5.2	5.6	4.7	5.4	4.4	5.4	5.2
2.5 ≤ E < 2.7	5.1	5.5	4.7	5.3	4.3	5.3	5.2
2.7 ≤ E < 2.9	5.0	5.4	4.6	5.3	4.3	5.2	5.1
2.9 ≤ E < 3.1	4.9	5.4	4.5	5.2	4.2	5.1	5.0
3.1 ≤ E < 3.3	4.9	5.3	4.5	5.1	4.1	5.1	4.9
3.3 ≤ E < 3.5	4.8	5.2	4.4	5.0	4.1	5.0	4.9
3.5 ≤ E < 3.7	4.8	5.1	4.4	5.0	4.0	4.9	4.8
3.7 ≤ E < 3.9	4.7	5.1	4.3	4.9	4.0	4.9	4.8
3.9 ≤ E < 4.1	4.6	5.0	4.3	4.9	4.0	4.9	4.7
4.1 ≤ E < 4.3	4.6	5.0	4.3	4.9	4.0	4.8	4.7
4.3 ≤ E < 4.5	4.6	4.9	4.2	4.8	4.0	4.8	4.7
4.5 ≤ E < 4.7	4.5	4.9	4.2	4.8	4.0	4.7	4.6
4.7 ≤ E < 4.9	4.5	4.9	4.1	4.7	4.0	4.7	4.6
E ≥ 4.9	4.5	4.9	4.1	4.7	4.0	4.7	4.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	37.5 < Assembly Average Burnup ≤ 40 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	5.7	6.1	5.2	5.9	4.7	5.9	5.7
2.7 ≤ E < 2.9	5.6	6.0	5.1	5.8	4.6	5.8	5.7
2.9 ≤ E < 3.1	5.5	5.9	5.0	5.8	4.6	5.7	5.6
3.1 ≤ E < 3.3	5.5	5.9	4.9	5.7	4.5	5.6	5.5
3.3 ≤ E < 3.5	5.4	5.8	4.9	5.6	4.4	5.6	5.4
3.5 ≤ E < 3.7	5.3	5.7	4.8	5.6	4.4	5.5	5.4
3.7 ≤ E < 3.9	5.2	5.7	4.7	5.5	4.3	5.4	5.3
3.9 ≤ E < 4.1	5.2	5.6	4.7	5.4	4.3	5.4	5.2
4.1 ≤ E < 4.3	5.1	5.6	4.6	5.4	4.3	5.3	5.2
4.3 ≤ E < 4.5	5.0	5.5	4.6	5.3	4.2	5.3	5.1
4.5 ≤ E < 4.7	5.0	5.5	4.5	5.3	4.2	5.2	5.0
4.7 ≤ E < 4.9	5.0	5.4	4.5	5.2	4.1	5.2	5.0
E ≥ 4.9	4.9	5.4	4.5	5.2	4.1	5.1	5.0

Table B2-23 Loading Table for BWR Fuel – 379 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	40 < Assembly Average Burnup ≤ 41 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.0	6.5	5.4	6.2	4.9	6.1	6.0
2.7 ≤ E < 2.9	5.9	6.4	5.3	6.1	4.8	6.0	5.9
2.9 ≤ E < 3.1	5.8	6.2	5.2	6.0	4.7	5.9	5.8
3.1 ≤ E < 3.3	5.7	6.1	5.1	5.9	4.7	5.9	5.7
3.3 ≤ E < 3.5	5.6	6.0	5.0	5.9	4.6	5.8	5.6
3.5 ≤ E < 3.7	5.5	6.0	5.0	5.8	4.5	5.7	5.6
3.7 ≤ E < 3.9	5.5	5.9	4.9	5.7	4.5	5.7	5.5
3.9 ≤ E < 4.1	5.4	5.9	4.9	5.7	4.4	5.6	5.5
4.1 ≤ E < 4.3	5.3	5.8	4.8	5.6	4.4	5.5	5.4
4.3 ≤ E < 4.5	5.3	5.8	4.8	5.6	4.4	5.5	5.3
4.5 ≤ E < 4.7	5.2	5.7	4.7	5.5	4.3	5.4	5.3
4.7 ≤ E < 4.9	5.2	5.7	4.7	5.5	4.3	5.4	5.2
E ≥ 4.9	5.1	5.6	4.6	5.4	4.2	5.4	5.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	41 < Assembly Average Burnup ≤ 42 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.3	6.8	5.6	6.5	5.1	6.4	6.2
2.7 ≤ E < 2.9	6.2	6.7	5.5	6.4	5.0	6.3	6.1
2.9 ≤ E < 3.1	6.0	6.6	5.5	6.3	4.9	6.2	6.0
3.1 ≤ E < 3.3	6.0	6.5	5.4	6.2	4.8	6.1	5.9
3.3 ≤ E < 3.5	5.9	6.4	5.3	6.1	4.8	6.0	5.9
3.5 ≤ E < 3.7	5.8	6.3	5.2	6.0	4.7	5.9	5.8
3.7 ≤ E < 3.9	5.7	6.2	5.1	5.9	4.6	5.9	5.7
3.9 ≤ E < 4.1	5.6	6.1	5.0	5.9	4.6	5.8	5.7
4.1 ≤ E < 4.3	5.6	6.0	5.0	5.8	4.5	5.8	5.6
4.3 ≤ E < 4.5	5.5	6.0	4.9	5.8	4.5	5.7	5.6
4.5 ≤ E < 4.7	5.5	5.9	4.9	5.7	4.5	5.7	5.5
4.7 ≤ E < 4.9	5.4	5.9	4.9	5.7	4.4	5.6	5.5
E ≥ 4.9	5.4	5.8	4.8	5.6	4.4	5.6	5.4

Table B2-23 Loading Table for BWR Fuel – 379 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	42 < Assembly Average Burnup ≤ 43 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	6.6	7.1	5.9	6.8	5.3	6.8	6.6
2.7 ≤ E < 2.9	6.5	7.0	5.8	6.7	5.2	6.6	6.4
2.9 ≤ E < 3.1	6.4	6.9	5.7	6.6	5.1	6.5	6.3
3.1 ≤ E < 3.3	6.3	6.8	5.6	6.5	5.0	6.4	6.2
3.3 ≤ E < 3.5	6.1	6.7	5.5	6.4	4.9	6.3	6.1
3.5 ≤ E < 3.7	6.0	6.6	5.4	6.3	4.9	6.2	6.0
3.7 ≤ E < 3.9	6.0	6.5	5.4	6.2	4.8	6.1	5.9
3.9 ≤ E < 4.1	5.9	6.4	5.3	6.1	4.8	6.0	5.9
4.1 ≤ E < 4.3	5.8	6.3	5.2	6.0	4.7	6.0	5.8
4.3 ≤ E < 4.5	5.8	6.3	5.1	6.0	4.6	5.9	5.8
4.5 ≤ E < 4.7	5.7	6.2	5.1	6.0	4.6	5.9	5.7
4.7 ≤ E < 4.9	5.7	6.1	5.0	5.9	4.6	5.9	5.7
E ≥ 4.9	5.6	6.1	5.0	5.9	4.5	5.8	5.6

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	43 < Assembly Average Burnup ≤ 44 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	7.0	7.6	6.1	7.2	5.5	7.1	6.9
2.7 ≤ E < 2.9	6.8	7.4	6.0	7.0	5.4	6.9	6.7
2.9 ≤ E < 3.1	6.7	7.3	5.9	6.9	5.3	6.8	6.6
3.1 ≤ E < 3.3	6.6	7.1	5.8	6.8	5.2	6.7	6.5
3.3 ≤ E < 3.5	6.5	7.0	5.7	6.7	5.1	6.6	6.4
3.5 ≤ E < 3.7	6.4	6.9	5.7	6.6	5.0	6.5	6.3
3.7 ≤ E < 3.9	6.3	6.8	5.6	6.5	5.0	6.5	6.2
3.9 ≤ E < 4.1	6.2	6.7	5.5	6.4	4.9	6.4	6.1
4.1 ≤ E < 4.3	6.1	6.7	5.5	6.4	4.9	6.3	6.0
4.3 ≤ E < 4.5	6.0	6.6	5.4	6.3	4.8	6.2	6.0
4.5 ≤ E < 4.7	5.9	6.5	5.3	6.2	4.8	6.1	5.9
4.7 ≤ E < 4.9	5.9	6.5	5.3	6.2	4.7	6.1	5.9
E ≥ 4.9	5.8	6.4	5.2	6.1	4.7	6.0	5.9

Table B2-23 Loading Table for BWR Fuel – 379 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	44 < Assembly Average Burnup ≤ 45 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	7.2	7.9	6.3	7.5	5.6	7.4	7.1
2.9 ≤ E < 3.1	7.0	7.7	6.2	7.3	5.5	7.2	6.9
3.1 ≤ E < 3.3	6.9	7.6	6.1	7.1	5.4	7.0	6.8
3.3 ≤ E < 3.5	6.8	7.4	6.0	7.0	5.4	6.9	6.7
3.5 ≤ E < 3.7	6.7	7.3	5.9	6.9	5.3	6.9	6.6
3.7 ≤ E < 3.9	6.6	7.2	5.8	6.8	5.2	6.8	6.5
3.9 ≤ E < 4.1	6.5	7.1	5.8	6.8	5.1	6.7	6.4
4.1 ≤ E < 4.3	6.4	7.0	5.7	6.7	5.0	6.6	6.3
4.3 ≤ E < 4.5	6.3	6.9	5.6	6.6	5.0	6.5	6.3
4.5 ≤ E < 4.7	6.3	6.8	5.6	6.5	4.9	6.4	6.2
4.7 ≤ E < 4.9	6.2	6.8	5.5	6.5	4.9	6.4	6.1
E ≥ 4.9	6.1	6.7	5.4	6.4	4.8	6.3	6.1

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	45 < Assembly Average Burnup ≤ 46 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	8.5	9.3	7.3	8.8	6.3	8.6	8.2
2.9 ≤ E < 3.1	8.3	9.0	7.1	8.6	6.2	8.4	8.0
3.1 ≤ E < 3.3	8.1	8.9	7.0	8.4	6.0	8.2	7.9
3.3 ≤ E < 3.5	8.0	8.8	6.8	8.2	6.0	8.0	7.7
3.5 ≤ E < 3.7	7.9	8.6	6.7	8.0	5.9	7.9	7.6
3.7 ≤ E < 3.9	7.7	8.4	6.7	7.9	5.8	7.8	7.5
3.9 ≤ E < 4.1	7.6	8.3	6.6	7.8	5.8	7.7	7.4
4.1 ≤ E < 4.3	7.5	8.2	6.5	7.7	5.7	7.6	7.3
4.3 ≤ E < 4.5	7.4	8.1	6.4	7.6	5.6	7.5	7.2
4.5 ≤ E < 4.7	7.3	8.0	6.3	7.6	5.6	7.4	7.1
4.7 ≤ E < 4.9	7.2	7.9	6.2	7.5	5.5	7.4	7.0
E ≥ 4.9	7.1	7.8	6.1	7.4	5.4	7.3	7.0

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	46 < Assembly Average Burnup ≤ 47 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	9.1	10.0	7.7	9.3	6.7	9.2	8.7
2.9 ≤ E < 3.1	8.9	9.8	7.5	9.1	6.5	8.9	8.5
3.1 ≤ E < 3.3	8.7	9.5	7.4	8.9	6.4	8.8	8.3
3.3 ≤ E < 3.5	8.5	9.3	7.2	8.7	6.2	8.6	8.2
3.5 ≤ E < 3.7	8.3	9.1	7.0	8.6	6.1	8.4	8.0
3.7 ≤ E < 3.9	8.2	9.0	7.0	8.4	6.0	8.3	7.9
3.9 ≤ E < 4.1	8.0	8.8	6.9	8.3	6.0	8.1	7.8
4.1 ≤ E < 4.3	7.9	8.7	6.8	8.2	5.9	8.0	7.7
4.3 ≤ E < 4.5	7.8	8.6	6.7	8.1	5.8	7.9	7.6
4.5 ≤ E < 4.7	7.7	8.5	6.6	8.0	5.8	7.9	7.5
4.7 ≤ E < 4.9	7.6	8.4	6.5	7.9	5.7	7.8	7.4
E ≥ 4.9	7.5	8.3	6.5	7.8	5.7	7.7	7.4

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	47 < Assembly Average Burnup ≤ 48 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	9.8	10.7	8.2	9.9	6.9	9.8	9.3
2.9 ≤ E < 3.1	9.6	10.5	8.0	9.7	6.8	9.5	9.1
3.1 ≤ E < 3.3	9.3	10.2	7.8	9.5	6.7	9.3	8.9
3.3 ≤ E < 3.5	9.1	9.9	7.7	9.3	6.6	9.2	8.7
3.5 ≤ E < 3.7	8.9	9.7	7.5	9.1	6.5	9.0	8.5
3.7 ≤ E < 3.9	8.7	9.6	7.4	8.9	6.3	8.8	8.4
3.9 ≤ E < 4.1	8.6	9.4	7.2	8.8	6.2	8.7	8.2
4.1 ≤ E < 4.3	8.4	9.3	7.1	8.7	6.1	8.6	8.1
4.3 ≤ E < 4.5	8.3	9.1	7.0	8.6	6.0	8.4	8.0
4.5 ≤ E < 4.7	8.1	9.0	6.9	8.5	6.0	8.3	7.9
4.7 ≤ E < 4.9	8.0	8.9	6.9	8.3	5.9	8.2	7.8
E ≥ 4.9	7.9	8.8	6.8	8.2	5.9	8.1	7.8

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	48 < Assembly Average Burnup ≤ 49 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	10.5	11.6	8.7	10.8	7.3	10.6	9.9
2.9 ≤ E < 3.1	10.2	11.3	8.5	10.4	7.1	10.2	9.7
3.1 ≤ E < 3.3	10.0	11.0	8.3	10.1	7.0	9.9	9.4
3.3 ≤ E < 3.5	9.7	10.7	8.1	9.9	6.9	9.8	9.2
3.5 ≤ E < 3.7	9.5	10.5	7.9	9.7	6.8	9.6	9.0
3.7 ≤ E < 3.9	9.3	10.3	7.8	9.5	6.7	9.4	8.9
3.9 ≤ E < 4.1	9.1	10.1	7.7	9.4	6.5	9.2	8.7
4.1 ≤ E < 4.3	9.0	9.9	7.5	9.2	6.4	9.0	8.6
4.3 ≤ E < 4.5	8.8	9.7	7.4	9.1	6.3	8.9	8.5
4.5 ≤ E < 4.7	8.7	9.6	7.3	8.9	6.3	8.8	8.4
4.7 ≤ E < 4.9	8.6	9.5	7.2	8.9	6.2	8.7	8.3
E ≥ 4.9	8.5	9.3	7.1	8.8	6.1	8.6	8.2

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	49 < Assembly Average Burnup ≤ 50 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	11.0	12.0	9.0	11.2	7.6	11.0	10.3
3.1 ≤ E < 3.3	10.7	11.7	8.8	10.9	7.4	10.7	10.1
3.3 ≤ E < 3.5	10.4	11.5	8.6	10.7	7.2	10.4	9.8
3.5 ≤ E < 3.7	10.2	11.3	8.4	10.4	7.0	10.2	9.7
3.7 ≤ E < 3.9	10.0	11.0	8.2	10.2	7.0	10.0	9.5
3.9 ≤ E < 4.1	9.7	10.8	8.0	10.0	6.8	9.8	9.3
4.1 ≤ E < 4.3	9.6	10.6	7.9	9.8	6.7	9.7	9.1
4.3 ≤ E < 4.5	9.4	10.4	7.8	9.7	6.7	9.5	9.0
4.5 ≤ E < 4.7	9.3	10.2	7.7	9.5	6.6	9.4	8.9
4.7 ≤ E < 4.9	9.1	10.1	7.6	9.4	6.5	9.2	8.7
E ≥ 4.9	9.0	10.0	7.5	9.3	6.4	9.1	8.6

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	50 < Assembly Average Burnup ≤ 51 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	11.8	12.9	9.6	12.0	8.0	11.8	11.1
3.1 ≤ E < 3.3	11.5	12.6	9.4	11.7	7.8	11.5	10.9
3.3 ≤ E < 3.5	11.2	12.3	9.1	11.5	7.6	11.2	10.6
3.5 ≤ E < 3.7	10.9	11.9	8.9	11.1	7.5	11.0	10.3
3.7 ≤ E < 3.9	10.7	11.8	8.7	10.9	7.3	10.7	10.0
3.9 ≤ E < 4.1	10.4	11.6	8.6	10.7	7.2	10.5	9.9
4.1 ≤ E < 4.3	10.3	11.3	8.4	10.5	7.0	10.3	9.7
4.3 ≤ E < 4.5	10.0	11.2	8.3	10.4	7.0	10.1	9.6
4.5 ≤ E < 4.7	9.9	11.0	8.1	10.1	6.8	9.9	9.4
4.7 ≤ E < 4.9	9.8	10.9	8.0	10.0	6.8	9.8	9.3
E ≥ 4.9	9.6	10.7	7.9	9.9	6.7	9.7	9.1

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	51 < Assembly Average Burnup ≤ 52 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	12.7	13.9	10.3	12.9	8.4	12.6	11.9
3.1 ≤ E < 3.3	12.3	13.4	10.0	12.5	8.2	12.3	11.6
3.3 ≤ E < 3.5	11.9	13.2	9.8	12.1	8.0	11.9	11.3
3.5 ≤ E < 3.7	11.7	12.9	9.5	11.9	7.9	11.7	11.0
3.7 ≤ E < 3.9	11.5	12.6	9.3	11.7	7.7	11.4	10.8
3.9 ≤ E < 4.1	11.2	12.4	9.1	11.5	7.6	11.3	10.5
4.1 ≤ E < 4.3	11.0	12.1	8.9	11.3	7.4	11.0	10.3
4.3 ≤ E < 4.5	10.8	11.8	8.8	11.1	7.3	10.9	10.2
4.5 ≤ E < 4.7	10.6	11.7	8.7	10.9	7.2	10.7	10.0
4.7 ≤ E < 4.9	10.5	11.6	8.5	10.7	7.1	10.5	9.9
E ≥ 4.9	10.2	11.4	8.4	10.6	7.0	10.4	9.8

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	52 < Assembly Average Burnup ≤ 53 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	13.6	14.8	11.0	13.7	8.9	13.4	12.7
3.1 ≤ E < 3.3	13.2	14.5	10.7	13.3	8.7	13.1	12.4
3.3 ≤ E < 3.5	12.8	14.1	10.4	13.0	8.5	12.8	12.0
3.5 ≤ E < 3.7	12.6	13.8	10.1	12.7	8.3	12.5	11.8
3.7 ≤ E < 3.9	12.2	13.5	9.8	12.4	8.1	12.2	11.5
3.9 ≤ E < 4.1	11.9	13.2	9.7	12.2	7.9	12.0	11.3
4.1 ≤ E < 4.3	11.7	13.0	9.5	12.0	7.8	11.8	11.1
4.3 ≤ E < 4.5	11.6	12.7	9.3	11.8	7.7	11.5	10.9
4.5 ≤ E < 4.7	11.4	12.5	9.2	11.6	7.6	11.4	10.7
4.7 ≤ E < 4.9	11.2	12.4	9.0	11.5	7.5	11.3	10.5
E ≥ 4.9	11.0	12.1	8.9	11.3	7.4	11.1	10.4

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	53 < Assembly Average Burnup ≤ 54 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	14.5	15.8	11.8	14.6	9.5	14.4	13.6
3.1 ≤ E < 3.3	14.1	15.4	11.4	14.3	9.2	14.0	13.2
3.3 ≤ E < 3.5	13.8	15.1	11.1	13.9	8.9	13.6	12.8
3.5 ≤ E < 3.7	13.4	14.7	10.9	13.6	8.7	13.4	12.6
3.7 ≤ E < 3.9	13.1	14.4	10.6	13.3	8.6	13.1	12.2
3.9 ≤ E < 4.1	12.9	14.1	10.4	13.1	8.4	12.8	12.0
4.1 ≤ E < 4.3	12.6	13.9	10.1	12.8	8.2	12.5	11.8
4.3 ≤ E < 4.5	12.4	13.6	9.9	12.6	8.1	12.3	11.6
4.5 ≤ E < 4.7	12.1	13.4	9.7	12.3	7.9	12.1	11.4
4.7 ≤ E < 4.9	11.9	13.2	9.6	12.2	7.9	11.9	11.2
E ≥ 4.9	11.7	13.1	9.4	12.0	7.8	11.7	11.1

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	54 < Assembly Average Burnup ≤ 55 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	15.0	16.4	12.1	15.2	9.8	14.9	14.1
3.3 ≤ E < 3.5	14.7	16.0	11.9	14.9	9.5	14.6	13.7
3.5 ≤ E < 3.7	14.3	15.7	11.5	14.5	9.3	14.2	13.4
3.7 ≤ E < 3.9	13.9	15.4	11.3	14.2	9.0	13.9	13.1
3.9 ≤ E < 4.1	13.6	15.1	11.1	13.9	8.9	13.6	12.8
4.1 ≤ E < 4.3	13.3	14.7	10.8	13.6	8.7	13.4	12.5
4.3 ≤ E < 4.5	13.1	14.5	10.5	13.4	8.5	13.1	12.3
4.5 ≤ E < 4.7	12.9	14.3	10.4	13.2	8.4	13.0	12.1
4.7 ≤ E < 4.9	12.8	14.1	10.2	13.0	8.3	12.8	11.9
E ≥ 4.9	12.5	13.9	10.0	12.8	8.1	12.5	11.7

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	55 < Assembly Average Burnup ≤ 56 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	15.8	17.5	13.1	16.2	10.4	15.9	15.0
3.3 ≤ E < 3.5	15.5	17.1	12.7	15.8	10.1	15.5	14.6
3.5 ≤ E < 3.7	15.1	16.7	12.3	15.5	9.9	15.2	14.3
3.7 ≤ E < 3.9	14.7	16.3	12.0	15.1	9.7	14.8	13.9
3.9 ≤ E < 4.1	14.4	16.0	11.8	14.9	9.4	14.6	13.6
4.1 ≤ E < 4.3	14.0	15.7	11.5	14.5	9.2	14.3	13.4
4.3 ≤ E < 4.5	13.8	15.4	11.3	14.3	9.0	14.0	13.1
4.5 ≤ E < 4.7	13.7	15.2	11.1	14.1	8.8	13.8	12.9
4.7 ≤ E < 4.9	13.4	15.0	10.9	13.9	8.7	13.7	12.8
E ≥ 4.9	13.3	14.8	10.7	13.7	8.6	13.4	12.5

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ²³⁵U (E)	56 < Assembly Average Burnup ≤ 57 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	16.8	18.4	13.8	17.2	11.1	16.9	16.0
3.3 ≤ E < 3.5	16.5	18.1	13.5	16.8	10.9	16.4	15.5
3.5 ≤ E < 3.7	16.0	17.7	13.1	16.4	10.5	16.2	15.2
3.7 ≤ E < 3.9	15.7	17.3	12.9	16.1	10.2	15.7	14.8
3.9 ≤ E < 4.1	15.4	17.1	12.5	15.8	10.0	15.4	14.5
4.1 ≤ E < 4.3	15.1	16.8	12.2	15.4	9.8	15.2	14.3
4.3 ≤ E < 4.5	14.8	16.4	12.0	15.2	9.6	14.8	14.0
4.5 ≤ E < 4.7	14.6	16.2	11.8	15.0	9.4	14.7	13.8
4.7 ≤ E < 4.9	14.3	15.9	11.6	14.7	9.2	14.4	13.5
E ≥ 4.9	14.0	15.7	11.4	14.5	9.0	14.3	13.4

Initial Assembly Avg. Enrichment wt % ²³⁵U (E)	57 < Assembly Average Burnup ≤ 58 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	17.8	19.5	14.8	18.2	11.8	17.8	16.8
3.3 ≤ E < 3.5	17.3	19.1	14.4	17.7	11.5	17.5	16.5
3.5 ≤ E < 3.7	17.0	18.7	14.0	17.4	11.2	17.1	16.1
3.7 ≤ E < 3.9	16.6	18.3	13.6	17.0	10.9	16.8	15.7
3.9 ≤ E < 4.1	16.3	17.9	13.3	16.7	10.6	16.4	15.4
4.1 ≤ E < 4.3	15.9	17.7	13.1	16.3	10.3	16.1	15.1
4.3 ≤ E < 4.5	15.7	17.4	12.8	16.1	10.1	15.8	14.8
4.5 ≤ E < 4.7	15.5	17.1	12.5	15.9	9.9	15.5	14.6
4.7 ≤ E < 4.9	15.2	16.9	12.3	15.6	9.8	15.3	14.4
E ≥ 4.9	15.0	16.7	12.1	15.4	9.6	15.1	14.2

Table B2-24 Loading Table for BWR Fuel – 360 W/Assembly (continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	58 < Assembly Average Burnup ≤ 59 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	18.7	20.4	15.7	19.2	12.6	18.9	17.8
3.3 ≤ E < 3.5	18.4	20.0	15.2	18.8	12.2	18.4	17.4
3.5 ≤ E < 3.7	18.0	19.7	14.9	18.4	11.9	18.1	17.1
3.7 ≤ E < 3.9	17.6	19.3	14.5	18.1	11.6	17.7	16.7
3.9 ≤ E < 4.1	17.2	18.9	14.1	17.7	11.2	17.3	16.3
4.1 ≤ E < 4.3	16.9	18.7	13.8	17.4	11.0	17.1	16.1
4.3 ≤ E < 4.5	16.6	18.4	13.6	17.1	10.8	16.8	15.7
4.5 ≤ E < 4.7	16.4	18.0	13.3	16.9	10.6	16.5	15.5
4.7 ≤ E < 4.9	16.1	17.8	13.1	16.6	10.3	16.2	15.3
E ≥ 4.9	15.9	17.6	12.9	16.3	10.2	15.9	15.1

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	59 < Assembly Average Burnup ≤ 60 GWd/MTU Minimum Cooling Time (years)						
	BWR/2-3 7×7	BWR/4-6 7×7	BWR/2-3 8×8	BWR/4-6 8×8	BWR/2-3 9×9	BWR/4-6 9×9	BWR/4-6 10×10
2.1 ≤ E < 2.3	-	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-	-
2.9 ≤ E < 3.1	-	-	-	-	-	-	-
3.1 ≤ E < 3.3	-	-	-	-	-	-	-
3.3 ≤ E < 3.5	19.3	21.0	16.0	19.7	12.9	19.5	18.4
3.5 ≤ E < 3.7	18.9	20.7	15.6	19.3	12.7	19.1	17.9
3.7 ≤ E < 3.9	18.6	20.3	15.2	19.0	12.3	18.7	17.7
3.9 ≤ E < 4.1	18.2	19.9	14.9	18.7	11.9	18.3	17.3
4.1 ≤ E < 4.3	17.9	19.7	14.5	18.3	11.6	17.9	17.0
4.3 ≤ E < 4.5	17.6	19.4	14.2	18.1	11.4	17.7	16.6
4.5 ≤ E < 4.7	17.3	19.1	14.0	17.7	11.2	17.5	16.4
4.7 ≤ E < 4.9	17.1	18.8	13.8	17.6	11.0	17.2	16.1
E ≥ 4.9	16.9	18.6	13.6	17.3	10.8	16.9	15.9

Table B2-25 Loading Table for PWR Fuel – 959 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	2.5	-	-	-	-	-
1.5 ≤ E < 1.7	2.5	2.5	-	-	-	-
1.7 ≤ E < 1.9	2.5	2.5	2.9	-	-	-
1.9 ≤ E < 2.1	2.5	2.5	2.9	3.4	-	-
2.1 ≤ E < 2.3	2.5	2.5	2.8	3.3	3.9	4.1
2.3 ≤ E < 2.5	2.5	2.5	2.8	3.3	3.8	4.1
2.5 ≤ E < 2.7	2.5	2.5	2.8	3.3	3.8	4.0
2.7 ≤ E < 2.9	2.5	2.5	2.8	3.2	3.7	4.0
2.9 ≤ E < 3.1	2.5	2.5	2.7	3.2	3.7	3.9
3.1 ≤ E < 3.3	2.5	2.5	2.7	3.2	3.7	3.9
3.3 ≤ E < 3.5	2.5	2.5	2.7	3.2	3.6	3.9
3.5 ≤ E < 3.7	2.5	2.5	2.7	3.1	3.6	3.8
3.7 ≤ E < 3.9	2.5	2.5	2.7	3.1	3.6	3.8
3.9 ≤ E < 4.1	2.5	2.5	2.6	3.1	3.6	3.8
4.1 ≤ E < 4.3	2.5	2.5	2.6	3.1	3.5	3.8
4.3 ≤ E < 4.5	2.5	2.5	2.6	3.0	3.5	3.7
4.5 ≤ E < 4.7	2.5	2.5	2.6	3.0	3.5	3.7
4.7 ≤ E < 4.9	2.5	2.5	2.6	3.0	3.5	3.7
E ≥ 4.9	2.5	2.5	2.6	3.0	3.5	3.7

Table B2-25 Loading Table for PWR Fuel – 959 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.4	4.8	-	-	-	-
2.5 ≤ E < 2.7	4.4	4.7	5.2	5.4	5.6	5.8
2.7 ≤ E < 2.9	4.3	4.7	5.1	5.3	5.5	5.7
2.9 ≤ E < 3.1	4.3	4.6	5.0	5.2	5.4	5.6
3.1 ≤ E < 3.3	4.2	4.5	4.9	5.1	5.3	5.6
3.3 ≤ E < 3.5	4.2	4.5	4.9	5.1	5.3	5.5
3.5 ≤ E < 3.7	4.1	4.5	4.8	5.0	5.2	5.4
3.7 ≤ E < 3.9	4.1	4.4	4.8	4.9	5.1	5.3
3.9 ≤ E < 4.1	4.1	4.4	4.8	4.9	5.1	5.3
4.1 ≤ E < 4.3	4.0	4.4	4.7	4.9	5.0	5.2
4.3 ≤ E < 4.5	4.0	4.3	4.7	4.8	5.0	5.2
4.5 ≤ E < 4.7	4.0	4.3	4.6	4.8	4.9	5.1
4.7 ≤ E < 4.9	4.0	4.3	4.6	4.7	4.9	5.0
E ≥ 4.9	3.9	4.2	4.5	4.7	4.9	5.0

Table B2-25 Loading Table for PWR Fuel – 959 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45[a]
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	6.0	-
2.7 ≤ E < 2.9	5.9	6.2
2.9 ≤ E < 3.1	5.8	6.0
3.1 ≤ E < 3.3	5.8	6.0
3.3 ≤ E < 3.5	5.7	5.9
3.5 ≤ E < 3.7	5.6	5.8
3.7 ≤ E < 3.9	5.6	5.8
3.9 ≤ E < 4.1	5.5	5.7
4.1 ≤ E < 4.3	5.4	5.6
4.3 ≤ E < 4.5	5.4	5.6
4.5 ≤ E < 4.7	5.3	5.5
4.7 ≤ E < 4.9	5.3	5.5
E ≥ 4.9	5.2	5.4

[a] Cool times for burnup over 45 GWd/MTU are in Table B2-16

Table B2-26 Loading Table for PWR Fuel – 513 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	2.9	-	-	-	-	-
1.5 ≤ E < 1.7	2.9	3.8	-	-	-	-
1.7 ≤ E < 1.9	2.9	3.7	4.5	-	-	-
1.9 ≤ E < 2.1	2.9	3.7	4.5	5.7	-	-
2.1 ≤ E < 2.3	2.8	3.7	4.5	5.7	7.5	8.9
2.3 ≤ E < 2.5	2.8	3.6	4.4	5.6	7.4	8.8
2.5 ≤ E < 2.7	2.8	3.6	4.4	5.6	7.3	8.6
2.7 ≤ E < 2.9	2.8	3.6	4.4	5.5	7.2	8.5
2.9 ≤ E < 3.1	2.8	3.5	4.4	5.5	7.1	8.5
3.1 ≤ E < 3.3	2.8	3.5	4.3	5.5	7.1	8.4
3.3 ≤ E < 3.5	2.8	3.5	4.3	5.4	7.0	8.3
3.5 ≤ E < 3.7	2.7	3.5	4.3	5.4	7.0	8.2
3.7 ≤ E < 3.9	2.7	3.5	4.3	5.4	7.0	8.1
3.9 ≤ E < 4.1	2.7	3.5	4.3	5.3	6.9	8.1
4.1 ≤ E < 4.3	2.7	3.5	4.2	5.3	6.9	8.0
4.3 ≤ E < 4.5	2.7	3.5	4.2	5.3	6.8	8.0
4.5 ≤ E < 4.7	2.7	3.5	4.2	5.2	6.8	7.9
4.7 ≤ E < 4.9	2.7	3.4	4.2	5.2	6.8	7.9
E ≥ 4.9	2.7	3.4	4.2	5.2	6.8	7.9

Table B2-26 Loading Table for PWR Fuel – 513 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	10.9	13.7	-	-	-	-
2.5 ≤ E < 2.7	10.7	13.5	16.9	18.2	19.7	21.2
2.7 ≤ E < 2.9	10.5	13.3	16.5	18.0	19.4	20.8
2.9 ≤ E < 3.1	10.4	13.1	16.3	17.7	19.2	20.6
3.1 ≤ E < 3.3	10.2	12.8	16.0	17.5	18.9	20.4
3.3 ≤ E < 3.5	10.1	12.7	15.9	17.2	18.7	20.1
3.5 ≤ E < 3.7	10.0	12.5	15.6	17.0	18.4	19.9
3.7 ≤ E < 3.9	9.9	12.4	15.5	16.8	18.2	19.6
3.9 ≤ E < 4.1	9.8	12.3	15.3	16.7	18.0	19.5
4.1 ≤ E < 4.3	9.8	12.1	15.2	16.5	17.9	19.3
4.3 ≤ E < 4.5	9.7	12.0	15.1	16.3	17.7	19.2
4.5 ≤ E < 4.7	9.7	11.9	15.0	16.2	17.6	19.0
4.7 ≤ E < 4.9	9.6	11.9	14.9	16.1	17.5	18.8
E ≥ 4.9	9.5	11.8	14.8	16.0	17.3	18.7

Table B2-26 Loading Table for PWR Fuel – 513 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	22.7	-
2.7 ≤ E < 2.9	22.3	23.8
2.9 ≤ E < 3.1	22.1	23.5
3.1 ≤ E < 3.3	21.8	23.2
3.3 ≤ E < 3.5	21.6	22.9
3.5 ≤ E < 3.7	21.3	22.7
3.7 ≤ E < 3.9	21.1	22.5
3.9 ≤ E < 4.1	20.9	22.3
4.1 ≤ E < 4.3	20.8	22.1
4.3 ≤ E < 4.5	20.6	21.9
4.5 ≤ E < 4.7	20.4	21.8
4.7 ≤ E < 4.9	20.3	21.6
E ≥ 4.9	20.1	21.5

Table B2-27 Loading Table for PWR Fuel – 1300 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	2.5	-	-	-	-	-
1.5 ≤ E < 1.7	2.5	2.5	-	-	-	-
1.7 ≤ E < 1.9	2.5	2.5	2.5	-	-	-
1.9 ≤ E < 2.1	2.5	2.5	2.5	2.7	-	-
2.1 ≤ E < 2.3	2.5	2.5	2.5	2.6	3.0	3.2
2.3 ≤ E < 2.5	2.5	2.5	2.5	2.6	3.0	3.2
2.5 ≤ E < 2.7	2.5	2.5	2.5	2.6	3.0	3.1
2.7 ≤ E < 2.9	2.5	2.5	2.5	2.6	2.9	3.1
2.9 ≤ E < 3.1	2.5	2.5	2.5	2.5	2.9	3.0
3.1 ≤ E < 3.3	2.5	2.5	2.5	2.5	2.9	3.0
3.3 ≤ E < 3.5	2.5	2.5	2.5	2.5	2.9	3.0
3.5 ≤ E < 3.7	2.5	2.5	2.5	2.5	2.8	3.0
3.7 ≤ E < 3.9	2.5	2.5	2.5	2.5	2.8	3.0
3.9 ≤ E < 4.1	2.5	2.5	2.5	2.5	2.8	2.9
4.1 ≤ E < 4.3	2.5	2.5	2.5	2.5	2.8	2.9
4.3 ≤ E < 4.5	2.5	2.5	2.5	2.5	2.8	2.9
4.5 ≤ E < 4.7	2.5	2.5	2.5	2.5	2.7	2.9
4.7 ≤ E < 4.9	2.5	2.5	2.5	2.5	2.7	2.9
E ≥ 4.9	2.5	2.5	2.5	2.5	2.7	2.8

Table B2-27 Loading Table for PWR Fuel – 1300 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	3.4	3.6	-	-	-	-
2.5 ≤ E < 2.7	3.3	3.6	3.8	3.9	4.0	4.1
2.7 ≤ E < 2.9	3.3	3.5	3.8	3.9	4.0	4.1
2.9 ≤ E < 3.1	3.3	3.5	3.7	3.8	3.9	4.0
3.1 ≤ E < 3.3	3.2	3.4	3.7	3.8	3.9	4.0
3.3 ≤ E < 3.5	3.2	3.4	3.6	3.7	3.8	3.9
3.5 ≤ E < 3.7	3.2	3.4	3.6	3.7	3.8	3.9
3.7 ≤ E < 3.9	3.1	3.4	3.6	3.6	3.8	3.9
3.9 ≤ E < 4.1	3.1	3.3	3.5	3.6	3.7	3.8
4.1 ≤ E < 4.3	3.1	3.3	3.5	3.6	3.7	3.8
4.3 ≤ E < 4.5	3.0	3.3	3.5	3.6	3.6	3.8
4.5 ≤ E < 4.7	3.0	3.2	3.4	3.5	3.6	3.7
4.7 ≤ E < 4.9	3.0	3.2	3.4	3.5	3.6	3.7
E ≥ 4.9	3.0	3.2	3.4	3.5	3.5	3.7

Table B2-27 Loading Table for PWR Fuel – 1300 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	4.3	-
2.7 ≤ E < 2.9	4.2	4.3
2.9 ≤ E < 3.1	4.2	4.3
3.1 ≤ E < 3.3	4.1	4.2
3.3 ≤ E < 3.5	4.0	4.2
3.5 ≤ E < 3.7	4.0	4.1
3.7 ≤ E < 3.9	4.0	4.0
3.9 ≤ E < 4.1	3.9	4.0
4.1 ≤ E < 4.3	3.9	4.0
4.3 ≤ E < 4.5	3.8	3.9
4.5 ≤ E < 4.7	3.9	3.9
4.7 ≤ E < 4.9	3.8	3.9
E ≥ 4.9	3.8	3.8

Table B2-28 Loading Table for PWR Fuel – 1800 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	2.5	-	-	-	-	-
1.5 ≤ E < 1.7	2.5	2.5	-	-	-	-
1.7 ≤ E < 1.9	2.5	2.5	2.5	-	-	-
1.9 ≤ E < 2.1	2.5	2.5	2.5	2.5	-	-
2.1 ≤ E < 2.3	2.5	2.5	2.5	2.5	2.5	2.5
2.3 ≤ E < 2.5	2.5	2.5	2.5	2.5	2.5	2.5
2.5 ≤ E < 2.7	2.5	2.5	2.5	2.5	2.5	2.5
2.7 ≤ E < 2.9	2.5	2.5	2.5	2.5	2.5	2.5
2.9 ≤ E < 3.1	2.5	2.5	2.5	2.5	2.5	2.5
3.1 ≤ E < 3.3	2.5	2.5	2.5	2.5	2.5	2.5
3.3 ≤ E < 3.5	2.5	2.5	2.5	2.5	2.5	2.5
3.5 ≤ E < 3.7	2.5	2.5	2.5	2.5	2.5	2.5
3.7 ≤ E < 3.9	2.5	2.5	2.5	2.5	2.5	2.5
3.9 ≤ E < 4.1	2.5	2.5	2.5	2.5	2.5	2.5
4.1 ≤ E < 4.3	2.5	2.5	2.5	2.5	2.5	2.5
4.3 ≤ E < 4.5	2.5	2.5	2.5	2.5	2.5	2.5
4.5 ≤ E < 4.7	2.5	2.5	2.5	2.5	2.5	2.5
4.7 ≤ E < 4.9	2.5	2.5	2.5	2.5	2.5	2.5
E ≥ 4.9	2.5	2.5	2.5	2.5	2.5	2.5

Table B2-28 Loading Table for PWR Fuel – 1800 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	2.6	2.7	-	-	-	-
2.5 ≤ E < 2.7	2.5	2.7	2.9	2.9	3.0	3.1
2.7 ≤ E < 2.9	2.5	2.7	2.8	2.9	3.0	3.0
2.9 ≤ E < 3.1	2.5	2.6	2.8	2.9	2.9	3.0
3.1 ≤ E < 3.3	2.5	2.6	2.8	2.8	2.9	3.0
3.3 ≤ E < 3.5	2.5	2.6	2.7	2.8	2.9	2.9
3.5 ≤ E < 3.7	2.5	2.5	2.7	2.8	2.8	2.9
3.7 ≤ E < 3.9	2.5	2.5	2.7	2.7	2.8	2.9
3.9 ≤ E < 4.1	2.5	2.5	2.6	2.7	2.8	2.8
4.1 ≤ E < 4.3	2.5	2.5	2.6	2.7	2.8	2.8
4.3 ≤ E < 4.5	2.5	2.5	2.6	2.7	2.7	2.8
4.5 ≤ E < 4.7	2.5	2.5	2.6	2.6	2.7	2.8
4.7 ≤ E < 4.9	2.5	2.5	2.5	2.6	2.7	2.7
E ≥ 4.9	2.5	2.5	2.5	2.6	2.6	2.7

Table B2-28 Loading Table for PWR Fuel – 1800 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	3.1	-
2.7 ≤ E < 2.9	3.1	3.2
2.9 ≤ E < 3.1	3.1	3.1
3.1 ≤ E < 3.3	3.0	3.1
3.3 ≤ E < 3.5	3.0	3.1
3.5 ≤ E < 3.7	3.0	3.0
3.7 ≤ E < 3.9	2.9	3.0
3.9 ≤ E < 4.1	2.9	3.0
4.1 ≤ E < 4.3	2.9	2.9
4.3 ≤ E < 4.5	2.8	2.9
4.5 ≤ E < 4.7	2.9	2.9
4.7 ≤ E < 4.9	2.8	2.9
E ≥ 4.9	2.8	2.8

Table B2-29 Loading Table for PWR Fuel – 830 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	2.5	-	-	-	-	-
1.5 ≤ E < 1.7	2.5	2.7	-	-	-	-
1.7 ≤ E < 1.9	2.5	2.7	3.2	-	-	-
1.9 ≤ E < 2.1	2.5	2.7	3.2	3.8	-	-
2.1 ≤ E < 2.3	2.5	2.6	3.1	3.7	4.4	4.7
2.3 ≤ E < 2.5	2.5	2.6	3.1	3.7	4.3	4.6
2.5 ≤ E < 2.7	2.5	2.6	3.1	3.6	4.3	4.6
2.7 ≤ E < 2.9	2.5	2.6	3.0	3.6	4.2	4.5
2.9 ≤ E < 3.1	2.5	2.5	3.0	3.6	4.2	4.5
3.1 ≤ E < 3.3	2.5	2.5	3.0	3.5	4.2	4.5
3.3 ≤ E < 3.5	2.5	2.5	3.0	3.5	4.1	4.4
3.5 ≤ E < 3.7	2.5	2.5	3.0	3.5	4.1	4.4
3.7 ≤ E < 3.9	2.5	2.5	3.0	3.5	4.0	4.4
3.9 ≤ E < 4.1	2.5	2.5	2.9	3.5	4.0	4.3
4.1 ≤ E < 4.3	2.5	2.5	2.9	3.4	4.0	4.3
4.3 ≤ E < 4.5	2.5	2.5	2.9	3.4	4.0	4.3
4.5 ≤ E < 4.7	2.5	2.5	2.9	3.4	4.0	4.2
4.7 ≤ E < 4.9	2.5	2.5	2.9	3.4	3.9	4.2
E ≥ 4.9	2.5	2.5	2.9	3.4	3.9	4.2

Table B2-29 Loading Table for PWR Fuel – 830 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	5.1	5.6	-	-	-	-
2.5 ≤ E < 2.7	5.0	5.6	6.1	6.4	6.8	7.1
2.7 ≤ E < 2.9	5.0	5.5	6.0	6.3	6.6	6.9
2.9 ≤ E < 3.1	4.9	5.4	6.0	6.2	6.5	6.8
3.1 ≤ E < 3.3	4.9	5.4	5.9	6.1	6.4	6.7
3.3 ≤ E < 3.5	4.8	5.3	5.8	6.0	6.3	6.6
3.5 ≤ E < 3.7	4.8	5.2	5.8	6.0	6.3	6.6
3.7 ≤ E < 3.9	4.7	5.2	5.7	5.9	6.2	6.5
3.9 ≤ E < 4.1	4.7	5.1	5.7	5.9	6.1	6.4
4.1 ≤ E < 4.3	4.6	5.1	5.6	5.8	6.0	6.3
4.3 ≤ E < 4.5	4.6	5.0	5.6	5.8	6.0	6.2
4.5 ≤ E < 4.7	4.6	5.0	5.5	5.7	5.9	6.2
4.7 ≤ E < 4.9	4.5	5.0	5.5	5.7	5.9	6.1
E ≥ 4.9	4.5	4.9	5.4	5.6	5.9	6.0

Table B2-29 Loading Table for PWR Fuel – 830 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	7.5	-
2.7 ≤ E < 2.9	7.3	7.7
2.9 ≤ E < 3.1	7.2	7.6
3.1 ≤ E < 3.3	7.0	7.5
3.3 ≤ E < 3.5	6.9	7.3
3.5 ≤ E < 3.7	6.8	7.2
3.7 ≤ E < 3.9	6.8	7.1
3.9 ≤ E < 4.1	6.7	7.0
4.1 ≤ E < 4.3	6.6	6.9
4.3 ≤ E < 4.5	6.6	6.8
4.5 ≤ E < 4.7	6.5	6.8
4.7 ≤ E < 4.9	6.4	6.7
E ≥ 4.9	6.4	6.7

Note: For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.

Table B2-30 Loading Table for PWR Fuel – 487 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	27.9	29.3	30.7	32.0	-	-
2.9 ≤ E < 3.1	27.6	29.0	30.4	31.8	32.7	33.9
3.1 ≤ E < 3.3	27.4	28.8	30.2	31.6	32.4	33.7
3.3 ≤ E < 3.5	27.1	28.5	30.0	31.4	32.2	33.6
3.5 ≤ E < 3.7	26.9	28.3	29.7	31.1	32.0	33.3
3.7 ≤ E < 3.9	26.7	28.1	29.5	30.9	31.8	33.1
3.9 ≤ E < 4.1	26.6	27.9	29.4	30.8	31.6	32.9
4.1 ≤ E < 4.3	26.3	27.8	29.2	30.6	31.4	33.5
4.3 ≤ E < 4.5	26.1	27.5	29.0	30.3	31.2	32.6
4.5 ≤ E < 4.7	26.0	27.4	28.8	30.2	31.1	32.4
4.7 ≤ E < 4.9	25.9	27.3	28.6	30.1	30.9	32.3
E ≥ 4.9	25.8	27.1	28.5	30.0	30.8	32.1

Table B2-30 Loading Table for PWR Fuel – 487 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	35.2	36.4	37.7	-	-	-
3.1 ≤ E < 3.3	35.0	36.2	37.4	38.8	39.8	41.0
3.3 ≤ E < 3.5	34.8	36.0	37.2	38.5	39.6	40.9
3.5 ≤ E < 3.7	34.5	35.9	37.1	38.4	39.5	40.7
3.7 ≤ E < 3.9	34.3	35.6	36.9	38.2	39.4	40.5
3.9 ≤ E < 4.1	34.2	35.4	36.7	38.1	39.2	40.4
4.1 ≤ E < 4.3	34.1	35.2	36.6	37.9	39.2	40.2
4.3 ≤ E < 4.5	33.9	35.2	36.4	37.7	39.0	40.2
4.5 ≤ E < 4.7	33.7	35.0	36.3	37.6	38.8	40.0
4.7 ≤ E < 4.9	33.5	34.8	36.1	37.4	38.7	39.8
E ≥ 4.9	33.4	34.7	35.9	37.3	38.6	39.7

Table B2-30 Loading Table for PWR Fuel – 487 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	42.1	43.3	-
3.3 ≤ E < 3.5	42.0	43.1	44.1
3.5 ≤ E < 3.7	41.9	43.0	44.1
3.7 ≤ E < 3.9	41.7	42.9	43.9
3.9 ≤ E < 4.1	41.6	42.7	43.8
4.1 ≤ E < 4.3	41.5	42.6	43.7
4.3 ≤ E < 4.5	41.3	42.5	43.6
4.5 ≤ E < 4.7	41.2	42.4	43.5
4.7 ≤ E < 4.9	41.0	42.3	43.4
E ≥ 4.9	40.9	42.1	43.3

Table B2-31 Loading Table for PWR Fuel – 1235 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	4.7	4.9	5.0	5.2	-	-
2.9 ≤ E < 3.1	4.6	4.8	4.9	5.1	5.2	5.4
3.1 ≤ E < 3.3	4.6	4.7	4.9	5.0	5.1	5.3
3.3 ≤ E < 3.5	4.5	4.6	4.8	4.9	5.0	5.2
3.5 ≤ E < 3.7	4.5	4.6	4.7	4.9	5.0	5.2
3.7 ≤ E < 3.9	4.4	4.5	4.7	4.8	4.9	5.1
3.9 ≤ E < 4.1	4.4	4.5	4.6	4.8	4.9	5.0
4.1 ≤ E < 4.3	4.3	4.4	4.5	4.7	4.8	4.9
4.3 ≤ E < 4.5	4.3	4.4	4.5	4.6	4.8	4.9
4.5 ≤ E < 4.7	4.2	4.3	4.5	4.6	4.7	4.8
4.7 ≤ E < 4.9	4.2	4.3	4.4	4.6	4.7	4.8
E ≥ 4.9	4.1	4.3	4.4	4.5	4.6	4.7

Table B2-31 Loading Table for PWR Fuel – 1235 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	5.6	5.8	6.0	-	-	-
3.1 ≤ E < 3.3	5.5	5.7	5.9	6.1	6.4	6.7
3.3 ≤ E < 3.5	5.4	5.6	5.8	6.0	6.3	6.5
3.5 ≤ E < 3.7	5.4	5.5	5.7	5.9	6.1	6.4
3.7 ≤ E < 3.9	5.3	5.5	5.6	5.8	6.0	6.3
3.9 ≤ E < 4.1	5.2	5.4	5.6	5.8	5.9	6.1
4.1 ≤ E < 4.3	5.1	5.3	5.5	5.7	5.9	6.0
4.3 ≤ E < 4.5	5.0	5.2	5.4	5.6	5.8	6.0
4.5 ≤ E < 4.7	5.0	5.1	5.3	5.5	5.7	5.9
4.7 ≤ E < 4.9	4.9	5.1	5.3	5.5	5.6	5.8
E ≥ 4.9	4.9	5.0	5.3	5.4	5.6	5.7

Table B2-31 Loading Table for PWR Fuel – 1235 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	6.9	7.2	-
3.3 ≤ E < 3.5	6.8	7.0	7.4
3.5 ≤ E < 3.7	6.7	6.9	7.2
3.7 ≤ E < 3.9	6.5	6.8	7.0
3.9 ≤ E < 4.1	6.4	6.7	6.9
4.1 ≤ E < 4.3	6.3	6.5	6.8
4.3 ≤ E < 4.5	6.2	6.4	6.7
4.5 ≤ E < 4.7	6.1	6.3	6.6
4.7 ≤ E < 4.9	6.0	6.2	6.5
E ≥ 4.9	5.9	6.1	6.4

Table B2-32 Loading Table for PWR Fuel – 1710 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	3.4	3.5	3.6	3.7	-	-
2.9 ≤ E < 3.1	3.4	3.5	3.5	3.6	3.7	3.8
3.1 ≤ E < 3.3	3.3	3.4	3.5	3.6	3.6	3.7
3.3 ≤ E < 3.5	3.3	3.4	3.4	3.5	3.6	3.7
3.5 ≤ E < 3.7	3.3	3.3	3.4	3.5	3.5	3.6
3.7 ≤ E < 3.9	3.2	3.3	3.4	3.4	3.5	3.6
3.9 ≤ E < 4.1	3.2	3.3	3.3	3.4	3.5	3.5
4.1 ≤ E < 4.3	3.1	3.2	3.3	3.4	3.4	3.5
4.3 ≤ E < 4.5	3.1	3.2	3.3	3.3	3.4	3.5
4.5 ≤ E < 4.7	3.1	3.2	3.2	3.3	3.4	3.4
4.7 ≤ E < 4.9	3.0	3.1	3.2	3.3	3.4	3.4
E ≥ 4.9	3.0	3.1	3.2	3.2	3.3	3.4

Table B2-32 Loading Table for PWR Fuel – 1710 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	3.9	4.0	4.0	-	-	-
3.1 ≤ E < 3.3	3.8	3.9	4.0	4.1	4.2	4.3
3.3 ≤ E < 3.5	3.8	3.9	4.0	4.0	4.2	4.3
3.5 ≤ E < 3.7	3.7	3.8	3.9	4.0	4.1	4.2
3.7 ≤ E < 3.9	3.7	3.8	3.8	3.9	4.0	4.2
3.9 ≤ E < 4.1	3.6	3.7	3.8	3.9	4.0	4.1
4.1 ≤ E < 4.3	3.6	3.7	3.8	3.8	3.9	4.0
4.3 ≤ E < 4.5	3.5	3.6	3.7	3.8	3.9	4.0
4.5 ≤ E < 4.7	3.5	3.6	3.7	3.8	3.9	3.9
4.7 ≤ E < 4.9	3.5	3.5	3.6	3.7	3.8	3.9
E ≥ 4.9	3.4	3.5	3.6	3.7	3.8	3.9

Table B2-32 Loading Table for PWR Fuel – 1710 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	4.4	4.6	-
3.3 ≤ E < 3.5	4.4	4.5	4.6
3.5 ≤ E < 3.7	4.3	4.4	4.5
3.7 ≤ E < 3.9	4.3	4.4	4.5
3.9 ≤ E < 4.1	4.2	4.3	4.4
4.1 ≤ E < 4.3	4.1	4.2	4.3
4.3 ≤ E < 4.5	4.1	4.2	4.3
4.5 ≤ E < 4.7	4.0	4.1	4.2
4.7 ≤ E < 4.9	4.0	4.1	4.2
E ≥ 4.9	3.9	4.0	4.1

Table B2-33 Loading Table for PWR Fuel – 788 W/Assembly – WE 14x14 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	9.0	9.7	10.4	11.2	-	-
2.9 ≤ E < 3.1	8.9	9.5	10.1	10.9	11.4	12.2
3.1 ≤ E < 3.3	8.7	9.2	9.9	10.6	11.1	11.9
3.3 ≤ E < 3.5	8.5	9.0	9.7	10.3	10.9	11.6
3.5 ≤ E < 3.7	8.4	8.9	9.5	10.1	10.6	11.4
3.7 ≤ E < 3.9	8.2	8.7	9.3	9.9	10.4	11.1
3.9 ≤ E < 4.1	8.1	8.6	9.1	9.7	10.2	10.9
4.1 ≤ E < 4.3	8.0	8.5	9.0	9.5	10.0	10.7
4.3 ≤ E < 4.5	7.9	8.4	8.8	9.4	9.8	10.5
4.5 ≤ E < 4.7	7.8	8.2	8.7	9.3	9.7	10.3
4.7 ≤ E < 4.9	7.7	8.1	8.6	9.1	9.5	10.2
E ≥ 4.9	7.6	8.0	8.5	9.0	9.4	10.0

Table B2-33 Loading Table for PWR Fuel – 788 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	13.1	14.0	15.0	-	-	-
3.1 ≤ E < 3.3	12.8	13.6	14.6	15.6	16.6	17.7
3.3 ≤ E < 3.5	12.4	13.3	14.2	15.3	16.2	17.3
3.5 ≤ E < 3.7	12.1	13.0	13.9	14.9	15.9	16.9
3.7 ≤ E < 3.9	11.9	13.0	13.6	14.6	15.5	16.5
3.9 ≤ E < 4.1	11.6	12.5	13.3	14.2	15.2	16.2
4.1 ≤ E < 4.3	11.4	12.2	13.1	13.9	14.9	15.9
4.3 ≤ E < 4.5	11.3	11.9	12.8	13.7	14.7	15.6
4.5 ≤ E < 4.7	11.1	11.8	12.6	13.5	14.4	15.3
4.7 ≤ E < 4.9	10.9	11.6	12.4	13.3	14.1	15.1
E ≥ 4.9	10.7	11.5	12.6	13.1	13.9	14.8

Table B2-33 Loading Table for PWR Fuel – 788 W/Assembly – WE 14x14 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	WE 14x14 Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	18.7	19.7	-
3.3 ≤ E < 3.5	18.2	19.3	20.4
3.5 ≤ E < 3.7	17.9	18.9	19.9
3.7 ≤ E < 3.9	17.5	18.6	19.6
3.9 ≤ E < 4.1	17.2	18.2	19.2
4.1 ≤ E < 4.3	16.9	17.9	18.9
4.3 ≤ E < 4.5	16.6	17.6	18.6
4.5 ≤ E < 4.7	16.3	17.3	18.3
4.7 ≤ E < 4.9	16.0	17.0	18.0
E ≥ 4.9	15.8	16.8	17.8

Table B2-34 Loading Table for PWR Fuel – 513 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	4.0	-	-	-	-	-
1.5 ≤ E < 1.7	4.0	4.0	-	-	-	-
1.7 ≤ E < 1.9	4.0	4.0	4.9	-	-	-
1.9 ≤ E < 2.1	4.0	4.0	4.8	6.1	-	-
2.1 ≤ E < 2.3	4.0	4.0	4.8	6.0	8.2	10.0
2.3 ≤ E < 2.5	4.0	4.0	4.7	6.0	8.1	9.9
2.5 ≤ E < 2.7	4.0	4.0	4.7	6.0	8.1	9.8
2.7 ≤ E < 2.9	4.0	4.0	4.7	5.9	8.0	9.7
2.9 ≤ E < 3.1	4.0	4.0	4.6	5.9	7.9	9.6
3.1 ≤ E < 3.3	4.0	4.0	4.6	5.9	7.9	9.5
3.3 ≤ E < 3.5	4.0	4.0	4.6	5.8	7.9	9.4
3.5 ≤ E < 3.7	4.0	4.0	4.6	5.8	7.8	9.4
3.7 ≤ E < 3.9	4.0	4.0	4.5	5.8	7.8	9.3
3.9 ≤ E < 4.1	4.0	4.0	4.5	5.8	7.7	9.2
4.1 ≤ E < 4.3	4.0	4.0	4.5	5.8	7.7	9.2
4.3 ≤ E < 4.5	4.0	4.0	4.5	5.7	7.7	9.2
4.5 ≤ E < 4.7	4.0	4.0	4.5	5.7	7.6	9.1
4.7 ≤ E < 4.9	4.0	4.0	4.5	5.7	7.6	9.1
E ≥ 4.9	4.0	4.0	4.5	5.7	7.6	9.0

Table B2-34 Loading Table for PWR Fuel – 513 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	12.5	15.8	-	-	-	-
2.5 ≤ E < 2.7	12.3	15.6	19.2	20.7	22.2	23.7
2.7 ≤ E < 2.9	12.1	15.4	19.0	20.5	22.0	23.4
2.9 ≤ E < 3.1	12.0	15.2	18.8	20.2	21.7	23.2
3.1 ≤ E < 3.3	11.9	15.0	18.5	19.9	21.5	23.0
3.3 ≤ E < 3.5	11.8	14.8	18.4	19.8	21.3	22.8
3.5 ≤ E < 3.7	11.7	14.7	18.2	19.7	21.1	22.5
3.7 ≤ E < 3.9	11.7	14.6	18.0	19.5	20.9	22.3
3.9 ≤ E < 4.1	11.6	14.5	17.9	19.3	20.8	22.2
4.1 ≤ E < 4.3	11.5	14.4	17.8	19.2	20.7	22.1
4.3 ≤ E < 4.5	11.4	14.3	17.7	19.1	20.5	21.9
4.5 ≤ E < 4.7	11.4	14.3	17.6	19.0	20.4	21.8
4.7 ≤ E < 4.9	11.4	14.2	17.5	18.9	20.3	21.7
E ≥ 4.9	11.3	14.1	17.4	18.8	20.2	21.6

Table B2-34 Loading Table for PWR Fuel – 513 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	25.1	-
2.7 ≤ E < 2.9	24.8	26.3
2.9 ≤ E < 3.1	24.6	26.1
3.1 ≤ E < 3.3	24.4	25.8
3.3 ≤ E < 3.5	24.2	25.6
3.5 ≤ E < 3.7	24.0	25.4
3.7 ≤ E < 3.9	23.8	25.3
3.9 ≤ E < 4.1	23.7	25.0
4.1 ≤ E < 4.3	23.6	24.9
4.3 ≤ E < 4.5	23.4	24.8
4.5 ≤ E < 4.7	23.2	24.6
4.7 ≤ E < 4.9	23.1	24.5
E ≥ 4.9	23.0	24.4

Table B2-35 Loading Table for PWR Fuel – 1300 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	4.0	-	-	-	-	-
1.5 ≤ E < 1.7	4.0	4.0	-	-	-	-
1.7 ≤ E < 1.9	4.0	4.0	4.0	-	-	-
1.9 ≤ E < 2.1	4.0	4.0	4.0	4.0	-	-
2.1 ≤ E < 2.3	4.0	4.0	4.0	4.0	4.0	4.0
2.3 ≤ E < 2.5	4.0	4.0	4.0	4.0	4.0	4.0
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.0	4.0	4.0
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-35 Loading Table for PWR Fuel – 1300 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.0	4.0	-	-	-	-
2.5 ≤ E < 2.7	4.0	4.0	4.1	4.2	4.3	4.5
2.7 ≤ E < 2.9	4.0	4.0	4.1	4.2	4.3	4.4
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.1	4.2	4.4
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.1	4.2	4.3
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.1	4.3
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.1	4.2
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.2
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.1
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.1
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-35 Loading Table for PWR Fuel – 1300 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	4.6	-
2.7 ≤ E < 2.9	4.5	4.7
2.9 ≤ E < 3.1	4.5	4.6
3.1 ≤ E < 3.3	4.4	4.5
3.3 ≤ E < 3.5	4.4	4.5
3.5 ≤ E < 3.7	4.3	4.4
3.7 ≤ E < 3.9	4.3	4.4
3.9 ≤ E < 4.1	4.2	4.3
4.1 ≤ E < 4.3	4.2	4.3
4.3 ≤ E < 4.5	4.2	4.3
4.5 ≤ E < 4.7	4.1	4.2
4.7 ≤ E < 4.9	4.1	4.2
E ≥ 4.9	4.0	4.2

Table B2-36 Loading Table for PWR Fuel – 1800 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	4.0	-	-	-	-	-
1.5 ≤ E < 1.7	4.0	4.0	-	-	-	-
1.7 ≤ E < 1.9	4.0	4.0	4.0	-	-	-
1.9 ≤ E < 2.1	4.0	4.0	4.0	4.0	-	-
2.1 ≤ E < 2.3	4.0	4.0	4.0	4.0	4.0	4.0
2.3 ≤ E < 2.5	4.0	4.0	4.0	4.0	4.0	4.0
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.0	4.0	4.0
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-36 Loading Table for PWR Fuel – 1800 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.0	4.0	-	-	-	-
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.0	4.0	4.0
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-36 Loading Table for PWR Fuel – 1800 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	4.0	-
2.7 ≤ E < 2.9	4.0	4.0
2.9 ≤ E < 3.1	4.0	4.0
3.1 ≤ E < 3.3	4.0	4.0
3.3 ≤ E < 3.5	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0
E ≥ 4.9	4.0	4.0

Table B2-37 Loading Table for PWR Fuel – 830 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	B ≤10	10< B ≤15	15< B ≤20	20< B ≤25	25< B ≤30	30< B ≤32.5
1.3 ≤ E < 1.5	4.0	-	-	-	-	-
1.5 ≤ E < 1.7	4.0	4.0	-	-	-	-
1.7 ≤ E < 1.9	4.0	4.0	4.0	-	-	-
1.9 ≤ E < 2.1	4.0	4.0	4.0	4.0	-	-
2.1 ≤ E < 2.3	4.0	4.0	4.0	4.0	4.7	5.0
2.3 ≤ E < 2.5	4.0	4.0	4.0	4.0	4.6	5.0
2.5 ≤ E < 2.7	4.0	4.0	4.0	4.0	4.6	4.9
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	4.5	4.9
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.5	4.8
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.4	4.8
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.4	4.7
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.4	4.7
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.4	4.7
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.3	4.6
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.3	4.6
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.3	4.6
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.3	4.5
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.2	4.5
E ≥ 4.9	4.0	4.0	4.0	4.0	4.2	4.5

Table B2-37 Loading Table for PWR Fuel – 830 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	32.5< B ≤35	35< B ≤37.5	37.5< B ≤40	40< B ≤41	41< B ≤42	42< B ≤43
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	5.5	6.0	-	-	-	-
2.5 ≤ E < 2.7	5.4	6.0	6.7	7.0	7.4	7.8
2.7 ≤ E < 2.9	5.4	5.9	6.6	6.9	7.2	7.7
2.9 ≤ E < 3.1	5.3	5.8	6.5	6.8	7.1	7.5
3.1 ≤ E < 3.3	5.2	5.8	6.4	6.7	7.0	7.4
3.3 ≤ E < 3.5	5.2	5.7	6.3	6.6	6.9	7.3
3.5 ≤ E < 3.7	5.1	5.7	6.3	6.6	6.8	7.2
3.7 ≤ E < 3.9	5.1	5.6	6.2	6.5	6.8	7.1
3.9 ≤ E < 4.1	5.0	5.6	6.1	6.4	6.7	7.0
4.1 ≤ E < 4.3	5.0	5.5	6.0	6.4	6.7	6.9
4.3 ≤ E < 4.5	5.0	5.5	6.0	6.3	6.6	6.9
4.5 ≤ E < 4.7	4.9	5.5	6.0	6.2	6.5	6.8
4.7 ≤ E < 4.9	4.9	5.4	5.9	6.2	6.5	6.8
E ≥ 4.9	4.9	5.4	5.9	6.1	6.4	6.7

Table B2-37 Loading Table for PWR Fuel – 830 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU	
	43< B ≤44	44< B ≤45
1.3 ≤ E < 1.5	-	-
1.5 ≤ E < 1.7	-	-
1.7 ≤ E < 1.9	-	-
1.9 ≤ E < 2.1	-	-
2.1 ≤ E < 2.3	-	-
2.3 ≤ E < 2.5	-	-
2.5 ≤ E < 2.7	8.2	-
2.7 ≤ E < 2.9	8.0	8.6
2.9 ≤ E < 3.1	7.9	8.4
3.1 ≤ E < 3.3	7.8	8.2
3.3 ≤ E < 3.5	7.7	8.1
3.5 ≤ E < 3.7	7.6	8.0
3.7 ≤ E < 3.9	7.5	7.9
3.9 ≤ E < 4.1	7.4	7.8
4.1 ≤ E < 4.3	7.3	7.7
4.3 ≤ E < 4.5	7.2	7.6
4.5 ≤ E < 4.7	7.1	7.5
4.7 ≤ E < 4.9	7.0	7.4
E ≥ 4.9	7.0	7.4

Note: **For fuel assembly average burnup greater than 45 GWd/MTU, cool time tables have been revised to account for a 5% margin in heat load.**

Table B2-38 Loading Table for PWR Fuel – 487 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	30.4	31.8	33.2	34.5	-	-
2.9 ≤ E < 3.1	30.1	31.6	32.9	34.3	35.5	36.8
3.1 ≤ E < 3.3	30.0	31.4	32.7	34.1	35.4	36.7
3.3 ≤ E < 3.5	29.8	31.2	32.6	33.9	35.2	36.6
3.5 ≤ E < 3.7	29.6	31.1	32.5	33.8	35.1	36.3
3.7 ≤ E < 3.9	29.4	30.8	32.3	33.6	34.9	36.3
3.9 ≤ E < 4.1	29.3	30.7	32.1	33.5	34.7	36.1
4.1 ≤ E < 4.3	29.1	30.6	32.0	33.4	34.6	35.9
4.3 ≤ E < 4.5	29.0	30.4	31.9	33.2	34.5	35.9
4.5 ≤ E < 4.7	28.9	30.2	31.7	33.1	34.4	35.7
4.7 ≤ E < 4.9	28.8	30.2	31.5	33.0	34.3	35.6
E ≥ 4.9	28.7	30.1	31.4	32.8	34.2	35.4

Table B2-38 Loading Table for PWR Fuel – 487 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	38.1	39.3	40.5	-	-	-
3.1 ≤ E < 3.3	38.0	39.2	40.3	41.5	42.1	43.1
3.3 ≤ E < 3.5	37.8	39.1	40.2	41.4	41.9	43.1
3.5 ≤ E < 3.7	37.6	38.9	40.0	41.2	41.8	42.9
3.7 ≤ E < 3.9	37.6	38.7	39.9	41.1	41.7	42.8
3.9 ≤ E < 4.1	37.4	38.7	39.8	41.1	41.6	42.7
4.1 ≤ E < 4.3	37.3	38.6	39.7	40.9	41.4	42.6
4.3 ≤ E < 4.5	37.2	38.4	39.6	40.9	41.3	42.5
4.5 ≤ E < 4.7	37.0	38.2	39.4	40.8	41.2	42.4
4.7 ≤ E < 4.9	36.9	38.2	39.5	40.7	41.0	42.3
E ≥ 4.9	36.8	38.0	39.3	40.5	40.9	42.1

Table B2-38 Loading Table for PWR Fuel – 487 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	44.3	45.3	-
3.3 ≤ E < 3.5	44.1	45.2	46.2
3.5 ≤ E < 3.7	44.0	45.1	46.2
3.7 ≤ E < 3.9	43.9	44.9	46.1
3.9 ≤ E < 4.1	43.8	44.9	46.0
4.1 ≤ E < 4.3	43.7	44.8	45.8
4.3 ≤ E < 4.5	43.7	44.7	45.8
4.5 ≤ E < 4.7	43.5	44.6	45.7
4.7 ≤ E < 4.9	43.4	44.5	45.7
E ≥ 4.9	43.4	44.4	45.6

Table B2-39 Loading Table for PWR Fuel – 1235 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	5.1	5.3	5.5	5.7	-	-
2.9 ≤ E < 3.1	5.0	5.2	5.4	5.6	5.8	6.0
3.1 ≤ E < 3.3	4.9	5.1	5.3	5.5	5.7	5.9
3.3 ≤ E < 3.5	4.9	5.0	5.2	5.4	5.6	5.8
3.5 ≤ E < 3.7	4.8	5.0	5.1	5.3	5.5	5.7
3.7 ≤ E < 3.9	4.8	4.9	5.0	5.2	5.4	5.6
3.9 ≤ E < 4.1	4.7	4.9	5.0	5.2	5.4	5.6
4.1 ≤ E < 4.3	4.7	4.8	4.9	5.1	5.3	5.5
4.3 ≤ E < 4.5	4.6	4.8	4.9	5.0	5.2	5.4
4.5 ≤ E < 4.7	4.5	4.7	4.8	5.0	5.1	5.3
4.7 ≤ E < 4.9	4.5	4.7	4.8	4.9	5.1	5.3
E ≥ 4.9	4.5	4.6	4.8	4.9	5.0	5.2

Table B2-39 Loading Table for PWR Fuel – 1235 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	6.2	6.5	6.7	-	-	-
3.1 ≤ E < 3.3	6.1	6.3	6.6	6.8	7.0	7.3
3.3 ≤ E < 3.5	6.0	6.2	6.5	6.7	6.9	7.1
3.5 ≤ E < 3.7	5.9	6.1	6.3	6.6	6.7	7.0
3.7 ≤ E < 3.9	5.8	6.0	6.2	6.5	6.6	6.9
3.9 ≤ E < 4.1	5.7	5.9	6.1	6.4	6.5	6.8
4.1 ≤ E < 4.3	5.7	5.8	6.0	6.3	6.4	6.7
4.3 ≤ E < 4.5	5.6	5.8	5.9	6.2	6.3	6.6
4.5 ≤ E < 4.7	5.5	5.7	5.9	6.0	6.2	6.4
4.7 ≤ E < 4.9	5.5	5.6	5.8	6.0	6.1	6.4
E ≥ 4.9	5.4	5.6	5.8	5.9	6.0	6.3

Table B2-39 Loading Table for PWR Fuel – 1235 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	7.7	8.0	-
3.3 ≤ E < 3.5	7.5	7.8	8.2
3.5 ≤ E < 3.7	7.3	7.6	8.0
3.7 ≤ E < 3.9	7.1	7.5	7.8
3.9 ≤ E < 4.1	7.0	7.3	7.7
4.1 ≤ E < 4.3	6.9	7.2	7.5
4.3 ≤ E < 4.5	6.8	7.0	7.4
4.5 ≤ E < 4.7	6.7	6.9	7.2
4.7 ≤ E < 4.9	6.6	6.9	7.1
E ≥ 4.9	6.5	6.8	7.0

Table B2-40 Loading Table for PWR Fuel – 1710 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	4.0	4.0	4.0	4.0	-	-
2.9 ≤ E < 3.1	4.0	4.0	4.0	4.0	4.0	4.1
3.1 ≤ E < 3.3	4.0	4.0	4.0	4.0	4.0	4.1
3.3 ≤ E < 3.5	4.0	4.0	4.0	4.0	4.0	4.0
3.5 ≤ E < 3.7	4.0	4.0	4.0	4.0	4.0	4.0
3.7 ≤ E < 3.9	4.0	4.0	4.0	4.0	4.0	4.0
3.9 ≤ E < 4.1	4.0	4.0	4.0	4.0	4.0	4.0
4.1 ≤ E < 4.3	4.0	4.0	4.0	4.0	4.0	4.0
4.3 ≤ E < 4.5	4.0	4.0	4.0	4.0	4.0	4.0
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.0	4.0	4.0
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.0	4.0
E ≥ 4.9	4.0	4.0	4.0	4.0	4.0	4.0

Table B2-40 Loading Table for PWR Fuel – 1710 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	4.2	4.4	4.5	-	-	-
3.1 ≤ E < 3.3	4.2	4.3	4.4	4.5	4.6	4.7
3.3 ≤ E < 3.5	4.1	4.2	4.3	4.4	4.5	4.6
3.5 ≤ E < 3.7	4.0	4.2	4.3	4.4	4.5	4.6
3.7 ≤ E < 3.9	4.0	4.1	4.2	4.3	4.4	4.5
3.9 ≤ E < 4.1	4.0	4.1	4.2	4.3	4.3	4.4
4.1 ≤ E < 4.3	4.0	4.0	4.1	4.2	4.3	4.4
4.3 ≤ E < 4.5	4.0	4.0	4.1	4.2	4.2	4.3
4.5 ≤ E < 4.7	4.0	4.0	4.0	4.1	4.2	4.3
4.7 ≤ E < 4.9	4.0	4.0	4.0	4.0	4.1	4.2
E ≥ 4.9	4.0	4.0	4.0	4.0	4.1	4.2

Table B2-40 Loading Table for PWR Fuel – 1710 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	4.9	5.0	-
3.3 ≤ E < 3.5	4.8	4.9	5.0
3.5 ≤ E < 3.7	4.7	4.8	5.0
3.7 ≤ E < 3.9	4.6	4.8	4.9
3.9 ≤ E < 4.1	4.5	4.7	4.8
4.1 ≤ E < 4.3	4.5	4.6	4.7
4.3 ≤ E < 4.5	4.4	4.5	4.7
4.5 ≤ E < 4.7	4.4	4.5	4.6
4.7 ≤ E < 4.9	4.3	4.4	4.5
E ≥ 4.9	4.3	4.4	4.5

Table B2-41 Loading Table for PWR Fuel – 788 W/Assembly – CE 16x16 Fuel

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	45< B ≤46	46< B ≤47	47< B ≤48	48< B ≤49	49< B ≤50	50< B ≤51
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	10.2	11.0	11.8	12.7	-	-
2.9 ≤ E < 3.1	9.9	10.7	11.5	12.3	13.3	14.2
3.1 ≤ E < 3.3	9.8	10.5	11.2	12.0	12.9	13.9
3.3 ≤ E < 3.5	9.6	10.2	11.0	11.8	12.6	13.6
3.5 ≤ E < 3.7	9.4	10.0	10.8	11.6	12.4	13.3
3.7 ≤ E < 3.9	9.2	9.8	10.6	11.3	12.0	13.0
3.9 ≤ E < 4.1	9.1	9.7	10.4	11.1	11.9	12.8
4.1 ≤ E < 4.3	9.0	9.5	10.2	11.0	11.7	12.5
4.3 ≤ E < 4.5	8.9	9.4	10.0	10.8	11.5	12.3
4.5 ≤ E < 4.7	8.8	9.3	9.9	10.6	11.4	12.1
4.7 ≤ E < 4.9	8.7	9.2	9.8	10.5	11.2	12.0
E ≥ 4.9	8.6	9.1	9.7	10.3	11.1	11.8

Table B2-41 Loading Table for PWR Fuel – 788 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU					
	51< B ≤52	52< B ≤53	53< B ≤54	54< B ≤55	55< B ≤56	56< B ≤57
1.3 ≤ E < 1.5	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-
2.1 ≤ E < 2.3	-	-	-	-	-	-
2.3 ≤ E < 2.5	-	-	-	-	-	-
2.5 ≤ E < 2.7	-	-	-	-	-	-
2.7 ≤ E < 2.9	-	-	-	-	-	-
2.9 ≤ E < 3.1	15.2	16.3	17.4	-	-	-
3.1 ≤ E < 3.3	14.9	15.9	17.0	18.0	18.7	19.7
3.3 ≤ E < 3.5	14.6	15.6	16.6	17.7	18.2	19.3
3.5 ≤ E < 3.7	14.2	15.2	16.3	17.3	17.9	19.0
3.7 ≤ E < 3.9	13.9	14.9	15.9	17.0	17.5	18.6
3.9 ≤ E < 4.1	13.7	14.6	15.6	16.7	17.2	18.2
4.1 ≤ E < 4.3	13.4	14.3	15.4	16.4	16.9	18.0
4.3 ≤ E < 4.5	13.2	14.1	15.1	16.1	16.7	17.7
4.5 ≤ E < 4.7	13.0	13.9	14.9	15.8	16.4	17.4
4.7 ≤ E < 4.9	12.8	13.7	14.7	15.7	16.1	17.2
E ≥ 4.9	12.7	13.5	14.5	15.4	16.0	17.0

Table B2-41 Loading Table for PWR Fuel – 788 W/Assembly – CE 16x16 Fuel (Continued)

Initial Assembly Avg. Enrichment wt % ^{235}U (E)	Assembly Average Burnup (B) GWd/MTU		
	57< B ≤58	58< B ≤59	59< B ≤60
1.3 ≤ E < 1.5	-	-	-
1.5 ≤ E < 1.7	-	-	-
1.7 ≤ E < 1.9	-	-	-
1.9 ≤ E < 2.1	-	-	-
2.1 ≤ E < 2.3	-	-	-
2.3 ≤ E < 2.5	-	-	-
2.5 ≤ E < 2.7	-	-	-
2.7 ≤ E < 2.9	-	-	-
2.9 ≤ E < 3.1	-	-	-
3.1 ≤ E < 3.3	20.8	21.8	-
3.3 ≤ E < 3.5	20.4	21.4	22.5
3.5 ≤ E < 3.7	20.0	21.1	22.1
3.7 ≤ E < 3.9	19.7	20.7	21.7
3.9 ≤ E < 4.1	19.3	20.3	21.4
4.1 ≤ E < 4.3	19.0	20.0	21.1
4.3 ≤ E < 4.5	18.7	19.7	20.8
4.5 ≤ E < 4.7	18.4	19.5	20.5
4.7 ≤ E < 4.9	18.2	19.2	20.2
E ≥ 4.9	17.9	19.0	20.0

Table B2-42 Low SNF Assembly Average Burnup Enrichment Limits for CE 16x16 Fuel Loaded via the PMTC

Max. Assembly Avg. Burnup (MWd/MTU)	Min. Assembly Avg. Initial Enrichment (wt% ^{235}U)	Minimum Cool Time (yrs)
10,000	1.3	4.0
15,000	1.5	4.0
20,000	1.7	4.0
25,000	1.9	4.1

Table B2-43 Loading Table for CE 16x16 Fuel Loaded via the PMTC

Initial Assembly Avg. Enrichment (wt% ^{235}U)	Assembly Average Burnup (GWd/MTU)						
	25 < B ≤ 30	30 < B ≤ 35	35 < B ≤ 40	40 < B ≤ 45	45 < B ≤ 50	50 < B ≤ 55	55 < B ≤ 60
	Minimum Cooling Time (years)						
1.3 ≤ E < 1.5	-	-	-	-	-	-	-
1.5 ≤ E < 1.7	-	-	-	-	-	-	-
1.7 ≤ E < 1.9	-	-	-	-	-	-	-
1.9 ≤ E < 2.1	-	-	-	-	-	-	-
2.1 ≤ E < 2.3	4.8	-	-	-	-	-	-
2.3 ≤ E < 2.5	4.7	5.7	-	-	-	-	-
2.5 ≤ E < 2.7	4.7	5.6	6.9	-	-	-	-
2.7 ≤ E < 2.9	4.6	5.5	6.8	8.9	-	-	-
2.9 ≤ E < 3.1	4.6	5.5	6.7	8.8	14.0	-	-
3.1 ≤ E < 3.3	4.5	5.4	6.6	8.6	13.7	19.0	-
3.3 ≤ E < 3.5	4.5	5.3	6.6	8.5	13.4	18.7	23.5
3.5 ≤ E < 3.7	4.5	5.3	6.5	8.3	13.1	18.2	23.1
3.7 ≤ E < 3.9	4.4	5.2	6.4	8.2	12.9	17.9	22.7
3.9 ≤ E < 4.1	4.4	5.2	6.3	8.1	12.6	17.7	22.4
4.1 ≤ E < 4.3	4.4	5.2	6.3	8.0	12.4	17.4	22.1
4.3 ≤ E < 4.5	4.4	5.1	6.2	7.9	12.2	17.1	21.8
4.5 ≤ E < 4.7	4.3	5.1	6.2	7.8	12.0	16.8	21.5
4.7 ≤ E < 4.9	4.3	5.0	6.1	7.8	11.9	16.6	21.3
E ≥ 4.9	4.3	5.0	6.1	7.7	11.8	16.4	21.1

- The minimum cool times for heat loads of 811 W/assy for assembly average burnups less than 45 GWd/MTU and heat loads of 770 W/Assy for burnups greater than 45 GWd/MTU

Enclosure 5

FSAR Changed Pages and LOEP

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MAGNASTOR® FSAR, Amendment 11 RAI Responses Revision 21B

(Docket No 72-1031)

NAC International

August 2021

August 2021

Revision 21B

MAGNASTOR®

(Modular Advanced Generation Nuclear All-purpose STORage)

FINAL SAFETY ANALYSIS REPORT

NON-PROPRIETARY VERSION

Docket No. 72-1031

NAC INTERNATIONAL

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2.2 Spent Fuel To Be Stored

MAGNASTOR is designed to safely store up to 37 PWR fuel assemblies or up to 89 BWR fuel assemblies. PWR assemblies are stored in either standard or damaged fuel basket each having a 37-assembly maximum capacity. The BWR undamaged basket has an 89-assembly capacity while the BWR damaged basket is limited to 81 assemblies. The PWR system is designed to store up to four damaged fuel cans (DFCs) in the DF Basket assembly while the BWR DF Basket assemblies are designed to store up to twelve DFCs. Each DFC may contain an undamaged fuel assembly, a damaged fuel assembly, or fuel debris equivalent to one undamaged fuel assembly. Undamaged fuel assemblies may be placed directly in the DFC locations of a DF Basket Assembly. PWR fuel assemblies may be stored with nonfuel hardware. PWR fuel assemblies loaded into a DFC shall not contain nonfuel hardware, with the exception of instrument tube tie components and steel inserts.

The fuel assemblies are assigned to two groups of PWR and two groups of BWR fuel assemblies on the basis of fuel assembly length. Refer to Chapter 1 for the fuel assembly length groupings.

PWR and BWR fuel assemblies having parameters as shown in Table 2.2-1 and Table 2.2-2, respectively, may be stored in MAGNASTOR.

The minimum initial enrichment limits are shown in Table 2.2-1 and Table 2.2-2 for PWR and BWR fuel, respectively. Fuel assemblies with low enriched, unenriched, and/or annular axial end-blankets may be loaded into MAGNASTOR.

2.2.1 PWR Fuel Evaluation

MAGNASTOR evaluations are based on bounding PWR fuel assembly parameters that maximize the source terms for the shielding evaluations, the reactivity for criticality evaluations, the decay heat load for the thermal evaluations, and the fuel weight for the structural evaluations. These bounding parameters are selected from the various spent fuel assemblies that are candidates for storage in MAGNASTOR. The bounding fuel assembly values are established based primarily on how the principal parameters are combined, and on the loading conditions (or restrictions) established for a group of fuel assemblies based on its parameters.

The limiting parameters of the PWR fuel assemblies authorized for loading in MAGNASTOR are shown in Table 2.2-1. The maximum initial enrichments listed are based on maximum neutron absorber content (g $^{10}B/cm^2$) and maximum soluble absorber levels (ppm Boron). Lower absorber sheet areal densities and/or soluble boron concentrations are allowed in water for fuel assemblies with lower maximum enrichments. The maximum initial enrichment authorized represents the peak fuel rod enrichment for variably enriched PWR fuel assemblies. The PWR

fuel assembly characteristics are summarized by fuel assembly type in Table 6.4.3-1, with maximum initial enrichment/ minimum soluble boron content as a function of absorber sheet loading listed in Table 6.4.3-2. Table 2.2-1 assembly physical information is limited to the criticality analysis input of fuel mass, array configuration, and number of fuel rods. These analysis values are key inputs to the shielding and criticality evaluations in Chapters 5 and 6. Lattice parameters dictating system reactivity are detailed in Chapter 6. Enrichment limits are set for each fuel type to produce reactivities at the upper subcritical limit (USL).

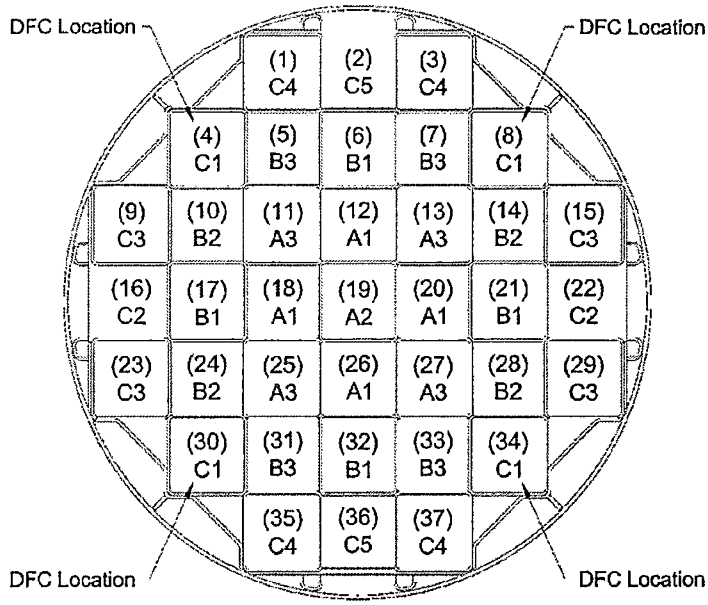
The maximum TSC decay heat load for the storage of PWR fuel assemblies varies depending on maximum fuel assembly heat load, transfer cask used, and zoning preference. Figure 2.2-1 shows the fuel storage locations for each loading pattern allowed in the PWR basket and in the DF Basket Assembly. The heat loads are a combined total of the fuel assembly and non-fuel hardware (if applicable). Each of the loading patterns and their associated fuel storage maximum heat loads are described below. Note, Figure 2.2-1 is a consolidated view of all the following patterns for both the PWR and PWR DF baskets. Designations for each pattern (e.g., A, B, C) is used for simplicity but may be referred to within the FSAR evaluations by their description instead of the pattern designation.

Pattern A is a uniform loading pattern that permits assemblies with a peak heat load of 0.96 kW/assembly. Pattern B is the preferential three-zone loading pattern permitting peak heat loads of 1.20 kW/assembly. Pattern C is the preferential four-zone loading pattern limited to Combustion Engineering (CE) 16×16 or Westinghouse (WE) 14×14 permitting peak heat loads of 1.80 kW/assembly. Pattern D is a uniform loading specifically for CE16×16 when the PMTC is utilized, which permits assemblies with a maximum heat load of 0.811 kW/assembly. Loading patterns I, J and K are high heat load patterns, i.e., greater than 35.5 kW. These patterns are also designated as patterns 37P-I, 37P-J and 37P-K in the thermal evaluation. Heat load patterns above 35.5 kW are not applicable to the 14×14 fuel types (i.e., CE14 and WE14)

The fuel basket configuration for PWR fuel with damaged fuel cans is shown in Figure 2.2-1. The bounding thermal evaluations for the baseline 35.5 kW heat load are based on the WE 17×17 fuel assembly. The minimum cool times applied to Patterns A though D are determined based on the maximum decay heat load of the contents. The fuel assemblies and source terms that produce the maximum storage and transfer cask dose rates are summarized in Section 5.1 for the 35.5 kW maximum heat load cases.

The maximum TSC decay heat load for the PMTC is 30 kW. The PMTC may only be loaded with Combustion Engineering 16×16 base type (PWR) fuel assemblies. The source terms that produce the maximum dose rates for the PMTC are summarized in Table 5.9.3-3.

Figure 2.2-1 PWR Fuel Preferential Loading Zones



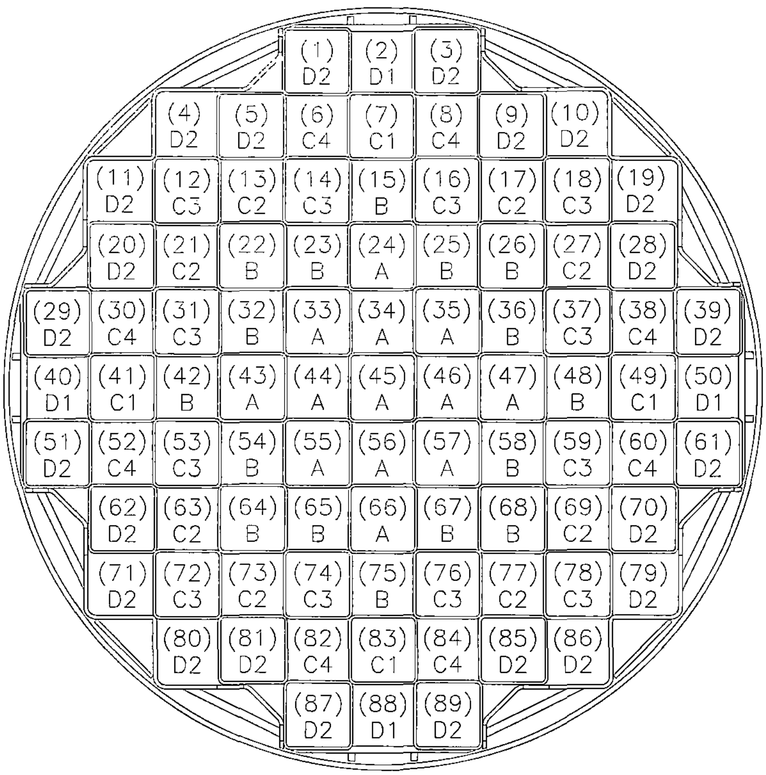
	Loading Pattern and Maximum Heat Load per Storage Location (W)						
Storage Location	A	B	C	D	I	J	K
A1	959	922	513	811	1380[1]	600	600
A2						400	400
A3							
B1		1,200	1,800			1250	700
B2			1,300			800	1900
B3							
C1		800	830			1250	800
C2						800	2500
C3						1250	800
C4						3250	
C5						800	2500
Max Heat Load per Cask	35,500	35,500	35,500	30,000	42,500	42,000	42,000
Pattern Use Limitations on Cask Configuration	None	None	None	PMTC	3" Liner and Heat Shield CC/LMTC	3" Liner and Heat Shield CC/LMTC	3" Liner and Heat Shield CC/LMTC
Pattern Use Limitations on Fuel Type	See Note (2)	See Note (2)	CE16x16 or WE14x14 Only	CE16x16 Only	Excludes CE14 and WE14	Excludes CE14 and WE14	Excludes CE14 and WE14

Notes:

(1) Loading Pattern I with heat load in any storage location above 1148W (uniform load) requires the following additional limits:

a. Assemblies with highest loads must be stored in Zone B.
b. Assemblies with lowest heat loads must be stored in Zone A, the lowest heat load in location A2.
c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (1)a. and (1)b.

Figure 2.2-2 BWR 89-Assembly Basket Preferential Load Pattern

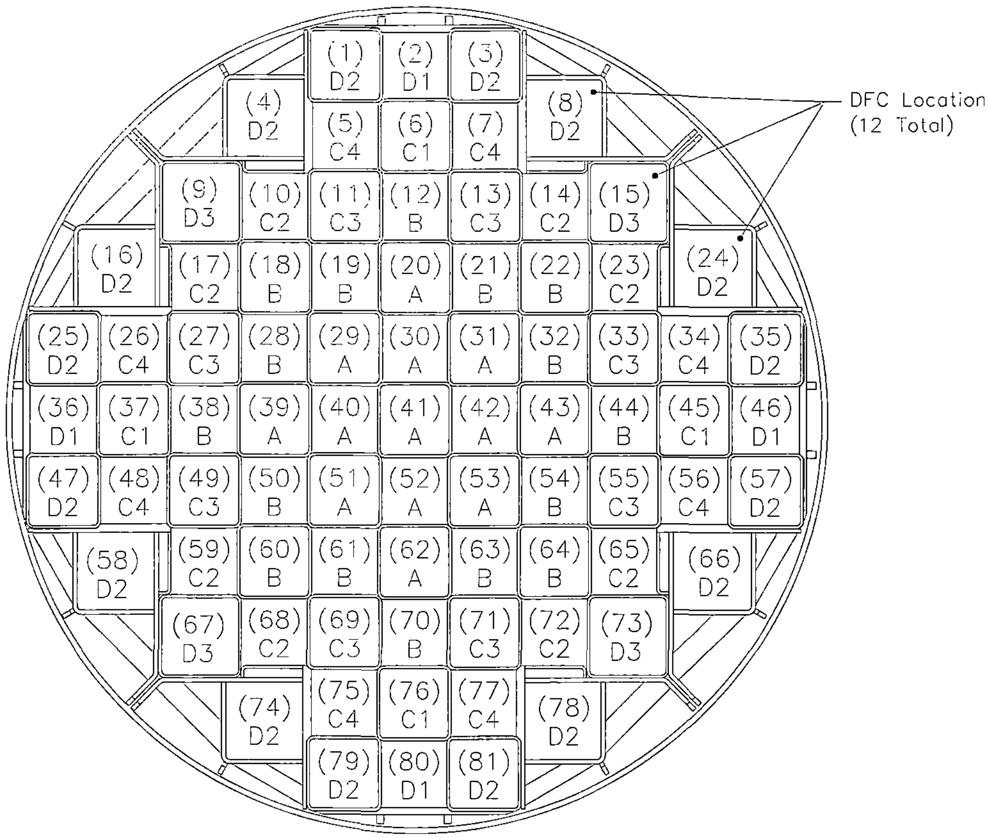


	Loading Pattern and Maximum Heat Load per Storage Location (W)			
Storage Location	**A**	**B**	**C**	**D**
A	379	533[1]	200	200
B			300	300
C1			1100	1000
C2			950	900
C3			600	600
C4			350	450
D1			450	450
D2				
Max Heat Load per Cask	33,000	39,500	42,000	42,000
Pattern Use Limitations	None	3" Liner and Heat Shield CC LMTC	3" Liner and Heat Shield CC LMTC	3" Liner and Heat Shield CC LMTC

Notes:

(1) Loading Pattern B with heat load in any storage location above 444W requires the following additional limits:
  a. Assemblies with highest loads must be stored in Zone C.
  b. Assemblies with lowest heat loads must be stored in Zone A and B, with the lowest overall heat load in the center of Zone A and progressively increasing heat loads in the surrounding rings.
  c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (1)a. and (1)b.

Figure 2.2-3 BWR 81-Assembly Basket Preferential Load Patterns



	Loading Pattern and Maximum Heat Load per Storage Location (W)		
Storage Location	**A**	**B**	**C**
A	585(1)	300	300
B		400	400
C1		1100	1000
C2		900	600
C3		500	600
C4		475	525
D1		425	525
D2		475	525
D3		500	600
Max Heat Load per Cask	39,500	41,000	41,000
Pattern Use Limitations	3" Liner and Heat Shield CC LMTC	3" Liner and Heat Shield CC LMTC	3" Liner and Heat Shield CC LMTC

Notes:

(1) Loading Pattern A with heat load in any storage location above 488W requires the following additional limits:

a. Assemblies with highest loads must be stored in Zone C.

b. Assemblies with lowest heat loads must be stored in Zone A and B, with the lowest overall heat load in the center of Zone A and progressively increasing heat loads in the surrounding rings.

c. Empty storage locations must be considered as zero (0) watt heat load assemblies in the context of limits (1)a. and (1)b.

Table 2.2-1 PWR Fuel Assembly Characteristics

Characteristic	Fuel Class					
	14×14	14×14	15×15	15×15	16×16	17×17
Base Fuel Type[a]	CE, SPC	WE, SPC	WE, SPC	BW, FCF	CE	BW, SPC, WE, FCF
Max Initial Enrichment (wt% ^{235}U)	5.0	5.0	5.0	5.0	5.0	5.0
Min Initial Enrichment (wt% ^{235}U)	1.3	1.3	1.3	1.3	1.3	1.3
Number of Fuel Rods	176	179	204	208	236	264
Max Assembly Average Burnup (MWd/MTU)	70,000	70,000	70,000	70,000	70,000	70,000

- Fuel cladding is a zirconium-based alloy.
- All reported enrichment values are nominal preirradiation fabrication values.
- Assemblies may contain nonfuel hardware and/or fuel replacement rods (also referred to as filler rods). Filler rods are considered to be a component of spent nuclear fuel assemblies and not nonfuel hardware. Filler rods may be burnable absorber rods, stainless steel rods or zirconium alloy rods.
- Required soluble boron content is fuel type and enrichment specific. Minimum soluble boron content varies. Maximum initial enrichment represents the peak fuel rod enrichment for variably-enriched fuel assemblies.
- Spacers may be used to axially position fuel assemblies to facilitate handling.

[a] Indicates assembly and/or nuclear steam supply system (NSSS) vendor/type referenced for fuel input data. Fuel acceptability for loading is not restricted to the indicated vendor provided that the fuel assembly meets the limits listed in Table 6.4.3-1. Table 6.2.1-1 contains vendor information by fuel rod array. Abbreviations are as follows: Westinghouse (WE), Combustion Engineering (CE), Siemens Power Corporation (SPC), Babcock and Wilcox (BW), and Framatome Cogema Fuels (FCF).

the concrete, the crush depth of the concrete, and the projected area of the concrete cylinder. Crushing of the concrete continues until the energy absorbed equals the potential energy of the cask at the initial drop height. The TSC is not rigidly attached to the concrete cask, so it is not considered to contribute to the concrete crushing. The energy balance equation is as follows.

$$w(h+\delta) = P_o A \delta$$

where:

h	=	24.0 inches	Drop height
δ			The crush depth of the concrete cask
P_o	=	3800 psi	Compressive strength of the concrete, 300°F
A	=	$\pi(R_2^2 - R_1^2) = 8.79\times10^3$ inch^2	Area of the concrete shield wall
R_1	=	42.75 inches	Inside radius of the concrete
R_2	=	68 inches	Outside radius of the concrete
w	=	175,000 lb	Bounding weight of concrete, rebar, and the enhanced shielding upper segment (bounds)

It is assumed that the maximum force that can be exerted on the concrete cask is the compressive strength of the concrete multiplied by the area of the concrete being crushed. The concrete cask's steel shell will not experience any significant damage during a 24-inch drop. Therefore, its functionality will not be impaired due to the drop.

The crush distance computed from the energy balance equation is as follows.

$$\delta = \frac{hw}{P_o A - w} = \frac{(24)(175\times10^3)}{(3800)(8.79\times10^3)-(175\times10^3)} = 0.126 \text{ inch}$$

Pedestal Crush Evaluation

Upon a bottom-end impact of the concrete cask, the TSC produces a force on the pedestal (base weldment) located near the bottom of the cask. Since the pedestal of CC3/CC5/CC7 with heat shield cask is identical to the pedestal of other MAGNASTOR casks, the evaluation presented in Section 3.7.3.6 is applicable to CC3/CC5/CC7 with heat shield. The maximum acceleration of the TSC is 25.2g, which is significantly less than the design g-load of 60g used in the TSC evaluation in Section 3.7.1.2.1. The pedestal is not subjected to failure and the condition of the air inlet opening is bounded by the consequences of the loss of one-half of the air inlets off-normal event.

3.11.3.4.7 Concrete Cask Tip-Over

Tip-over of the concrete cask is a nonmechanistic, hypothetical accident condition that presents a bounding case for evaluation. Existing postulated design basis accidents do not result in the tip-

over of the concrete cask. Functionally, the concrete cask does not suffer significant adverse consequences due to this event. The concrete cask, TSC, and basket maintain design basis shielding, geometry control of contents, and contents confinement performance requirements.

A detailed evaluation for the hypothetical tip-over event of MAGNASTOR casks is presented Section 3.7.3.7. Although the CC7 cask is very similar to previous concrete casks, the tip-over of the concrete cask onto the pad using the soil properties defined in Section 3.10.4 was performed. The peak accelerations for the top of the basket and the TSC are determined to be 25.5g and 27.2g respectively. These are bounded by the accelerations reported in Section 3.7.3.7, and therefore, no additional analyses are required.

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4.11 Thermal Evaluation for High Heat Load Configurations

This section presents the thermal evaluation of the MAGNASTOR system with heat load over 35.5 kW (up to 42.5 kW) for the PWR and PWR DF configurations and heat load over 33 kW (up to 42 kW) for the BWR and BWR DF configurations for normal, off-normal and accident conditions of storage and transfer operations. The concrete casks (CC3, CC5 and CC7) with heat shield are used for the evaluation of storage conditions. The Lightweight MAGNASTOR Transfer Cask (LMTC) is used for the evaluation of transfer conditions. For the PWR fuel assemblies, three types are considered: 15×15, 16×16 and 17×17. For the BWR fuel assemblies, four types are considered: 7×7, 8×8, 9×9 and 10×10. Three heat load patterns, 37P-I (42.5 kW), 37P-J (42 kW) and 37P-K (42 kW), are used for PWR and PWR-DF fuel baskets. Likewise, three heat load patterns, 89B-A (39.5 kW), 89B-B (42 kW) and 89B-C (42 kW), are used for the BWR fuel basket and another three heat load patterns, 81B-A (39.5 kW), 81B-B (41 kW) and 81B-C (41 kW), are used for BWR DF basket. These fuel load patterns are presented in Figures 4.11-1 through 4.11-9 and evaluated in this Section. Since the thermal evaluation using the PWR DF basket is bounded by the evaluation using the standard PWR basket as discussion in Section 4.1, the standard PWR basket is used in the evaluation for PWR configurations in this section. The thermal evaluations show that the MAGNASTOR systems with the high heat load configurations defined in this section meet the thermal performance requirements of 10 CFR 72 [1], NUREG-1567 [20], and NUREG-1536 [22].

4.11.1 Thermal Models for the High Heat Load Configurations

The thermal models for the MAGNASTOR system for high heat loading of PWR and BWR assemblies (and the damaged fuel cans, as applicable) use the same methodology as described in Section 4.4.1 for the analysis models for MAGNASTOR systems. Two-dimensional axisymmetric models are used for TSC and the concrete cask (for storage conditions) to generate the boundary conditions for three-dimensional quarter-symmetry model for TSC with PWR fuel and the eighth-symmetry model for TSC with BWR fuel. The need for the three-dimensional symmetry models is to accurately model the significant variation of the fuel assembly heat load in the basket.

Section 4.11.1.1 describes the two-dimensional axisymmetric models of the concrete cask and TSC for PWR and BWR configurations. The models are used to perform steady state FLUENT analysis for the normal, off-normal and accident conditions of storage. From these two-dimensional models, TSC surface temperature profiles are obtained for boundary conditions on the three-dimensional BWR model, and TSC top and bottom surface flux profiles and side heat transfer coefficient profiles are obtained for boundary conditions on the three-dimensional PWR model. Section 4.11.1.2 presents the three-dimensional TSC models used for storage conditions for PWR, BWR and BWR DF configurations. Section 4.11.1.3 presents a three-dimensional quarter (PWR) and eighth (BWR) models for transient analyses of the all inlets blocked conditions.

For the TSC transfer operations, two types of three-dimensional models are used for each of PWR, BWR and BWR DF configurations: (1) three-dimensional FLUENT models for the transfer cask and the TSC model as described in Section 4.11.1.4 and (2) three-dimensional ANSYS models for the loaded TSC as presented in Section 4.11.1.5. The FLUENT models are used to perform steady state or transient analyses for the water or helium backfilled phases of the TSC. The ANSYS models are used to perform transient analyses for the vacuum drying conditions of the transfer operation. Note that these thermal models consider a water inlet temperature of 70°F and a flowrate of 40 GPM (upflow) for the ACWS (Annulus Circulating Water cooling System) used during TSC transfer operation. The allowable time durations for different stages of the transfer operation, such as vacuum drying, cooling and transfer, are determined for the high heat load configurations using the LMTC. For the LMTC containing TSC with lower heat loads ($\leq$ 35.5 kW for PWR and $\leq$ 33 kW for BWR), the allowable time durations for different stages of the transfer operations as determined by the transfer cask (MTC) and TSC models presented in Sections 4.4.1 are applicable. The LMTC design (with a liquid

neutron shield having convection to transfer heat to the LMTC outer surface) provides a more efficient heat rejection path than the MTC (with a solid neutron shield).

In the two-dimensional models presented in Section 4.11.1.1, the fuel regions are modeled as homogeneous regions with effective thermal properties which are determined using the methodology described in Section 4.4.1.2. The flow of the helium in the homogenized fuel region is represented using porous media constants which simulates the flow resistance due to the fuel rods, fuel assembly grids and basket walls. The porous media constants used in the fuel region are described in Section 4.4.1.1. Similarly, in the three-dimensional models presented in Sections 4.11.1.2 through 4.11.1.5, the fuel assemblies are modeled as homogeneous region with effective thermal properties which are determined using the methodology described in Section 4.4.1.3. The porous media model of fuel assemblies is used in three-dimensional FLUENT models in Section 4.11.1.2 through Section 4.11.1.4. The porous media constants applied in the model are described in Section 4.8.2. In three-dimensional quarter-symmetry and the eighth-symmetry models in Sections 4.11.1.2 through 4.11.1.4, the basket fuel tube walls with neutron absorber are modeled using effective thermal properties which are determined using the two-dimensional fuel tube wall model as described in Section 4.11.1.6. The fuel tube corners are also modeled using effective thermal properties to account for the gaps between the fuel tube corners. The effective properties for tube corners are determined using the two-dimensional fuel tube corner model as presented in Section 4.11.1.7. The following sections provide more details of the thermal models used in the thermal evaluation for the MAGNASTOR system for high heat load configurations.

4.11.1.1 Two-Dimensional Axisymmetric Concrete Cask and TSC Models

This section describes the two-dimensional axisymmetric finite volume models used to evaluate the thermal performance of the concrete cask and TSC for the PWR and BWR fuel configurations. The model includes the following:

- Concrete cask, including lid, liner, pedestal and stand
- Air in the air inlets, the annulus and the air outlets
- Heat shield in the air annulus
- TSC shell, lid and bottom plate
- Basket with fuel (including damaged fuel cans, as applicable)
- Helium internal to the TSC

The models are similar for both PWR and BWR configurations. Hence, the figures shown in Figures 4.11-10 through 4.11-12 represent the models used for both PWR and BWR configurations. The modeling methodology for this model is same as the model described in Section 4.4.1.1. The main difference is the addition of heat shield in the annulus. The length of

heat shield is 144 inches and is 0.75 inch in thickness. The top of the shield is at the same elevation as the top of the TSC. The presence of heat shield in the middle of the annulus serves as an additional surface for convective heat transfer to the air and to block the direct heat radiation from TSC surface to the cask liner surface.

4.11.1.1.1 Two-Dimensional Axisymmetric Concrete Cask and TSC Models for PWR Configuration

The modeling details of the concrete cask and the TSC are identical to Section 4.4.1.1. The basket effective radius is decreased slightly to match the total volume of helium inside TSC in the two-dimensional model compared to three-dimensional models discussed in Section 4.11.1.2.

The maximum design basis heat load for the PWR (standard or DF basket) is 42.5 kW. The heat generation is applied in the active fuel region shown in Figure 4.11-10. The axial power distribution is applied as shown in Figure 4.4-3. The heat generation rate also incorporates the radial variation according to each heat load patterns as shown in Figures 4.11-1 through 4.11-3. For flexible uniform high heat load pattern 37P-I, the uniform heat load pattern is applied as it is bounding.

4.11.1.1.2 Two-Dimensional Axisymmetric Concrete Cask and TSC Models for BWR Configuration

The modeling details of the concrete cask and the TSC for BWR and BWR DF are identical to Section 4.4.1.1. The maximum design basis heat load for BWR basket is 42 kW, while for BWR DF basket assembly is 41 kW. The different heat load patterns considered for BWR and BWR DF are shown in Figures 4.11-4 through 4.11-9. The heat generation is applied in the active fuel region shown in Figure 4.11-10. The axial power distribution is applied as shown in Figure 4.4-4. The heat generation also incorporates the radial variation according to each heat load patterns. For flexible uniform high heat load patterns (89B-A for BWR and 81B-A for BWR-DF), the bounding uniform heat load is applied in all fuel assemblies.

4.11.1.2 Three-Dimensional TSC Models

This section describes the three-dimensional finite volume TSC models for the high heat PWR and BWR (including DF) fuel configurations. The quarter-symmetry and eighth-symmetry models are used for PWR and BWR high heat configurations, respectively. For the BWR configurations, temperature profiles at the TSC outer surfaces from the two-dimensional axisymmetric models discussed in Section 4.11.1.1 are applied as the boundary conditions in three-dimensional models. For the PWR configurations, heat flux profiles on TSC top and bottom surfaces, and heat transfer coefficient profiles on TSC side shell surface from the two-dimensional axisymmetric models discussed in Section 4.11.1.1 are applied as the boundary

conditions in three-dimensional models. The three-dimensional TSC models for both PWR and BWR includes the following:

- TSC shell, lid and bottom plate
- Fuel basket (with neutron absorber)
- Zircaloy tube (for BWR configuration)
- Fuel assemblies
- Helium internal to the TSC
- Damage Fuel Can (BWR-DF configuration)

More detailed descriptions of the models for PWR, BWR and BWR DF configurations are provided in the following sections.

4.11.1.2.1 Three-Dimensional TSC Models for PWR Configuration

For PWR configuration, a quarter-symmetry model is used. The components inside the TSC consist of the basket, fuel and helium region as shown in Figures 4.11-13 and 4.11-14. The basket is modeled as square tubes with an inside dimension (ID) of 8.82 inch for both the fuel tubes (ID=8.86 inch) and the developed slots (ID=8.76 inch). The fuel tube walls are modeled as 0.48-inch thick with effective thermal properties to account for the combination of the carbon steel fuel tube wall and the neutron absorber. The effective thermal properties are determined using a two-dimensional ANSYS model presented in Section 4.11.1.6.1. The fuel tube corners are also modeled using effective thermal conductivities to account for a 0.01-inch gap between fuel tube corners. The effective conductivities for tube corners are determined using the two-dimensional fuel tube corner model as presented in Section 4.11.1.7.1. The support weldments at the periphery of the basket provide a path of conduction. In the model, the parts like ridge gusset, corner support bar and center plates are not modeled conservatively. A portion of corner mounting plate is modeled as shown in Figure 4.11-13. An emissivity of 0.5 is used for the TSC shell surfaces and an emissivity of 0.32 is used for the outer surfaces of the coated basket plates in the model.

The fuel assemblies are modeled as homogeneous regions with effective properties. Using the methodology described in Section 4.4.1.3 with two-dimensional ANSYS models, the effective properties are calculated separately for the fuel assemblies in the fuel tube which has the dimension of 8.86-inch and developed slot which has the dimension of 8.76- inch. Effective thermal properties corresponding to 16×16 fuel assemblies are used, since the 16×16 fuel properties are bounding compared with 15×15 and 17×17 fuel types. In the axial direction, the fuel region is subdivided into three sections to reflect the location of the active fuel region with the associated heat generation and the fuel regions above and below the active fuel regions. The three separate fuel regions are shown in Figure 4.11-14.

To account for the resistance to flow in the fuel region in the basket due to the wetted perimeter of the fuel region in the basket, the porous media option for fluids is used. The resistance to flow due to the fuel rods and fuel assembly grids is represented in terms of a pressure drop included in the momentum equations for each cell in the model associated with porous media. The porous constants are calculated separately for fuel slots and developed slot using the method described in Section 4.8.2. Note that the porous media is not used for the downcomer helium region in the TSC. The helium flow in the downcomer region is conservatively modeled as laminar flow.

The thermal boundary condition from two-dimensional evaluation using the model described in Section 4.11.1.1.1 is used. The heat generation for the fuel is applied to the active fuel region of the TSC model according to the heat load patterns (37P-I, 37P-J and 37P-K) as shown in Figure 4.11-1 through 4.11-3. The individual heat load in each tube/slot is applied according to the axial power distribution shown in Figure 4.4-3. For flexible uniform heat load pattern, 37P-I, equal heat load is applied in all the tube/slot.

4.11.1.2.2 Three-Dimensional TSC Models for BWR Configuration

For the BWR configuration, an eighth-symmetry TSC model is used. The components inside the TSC for BWR configuration consist of the basket, channel, fuel and helium region as shown in Figures 4.11-16 through 4.11-19. The basket slot is modeled as square with same dimension for both the fuel tubes and developed slots (ID =5.802 inch). There are 89 fuel tubes/slots in BWR configuration. The effective basket wall is 0.378 inch thick which consists of the tube wall, neutron absorber, retainer and helium gaps. The channel is 0.08 inch thick with the ID of 5.278 inch. The gap of 0.182 inch between the basket wall and the channel is modeled as helium. The basket wall effective properties are determined by using a two-dimensional FLUENT model shown in Section 4.11.1.6.2. The fuel tube corners are also modeled using effective thermal conductivities to account for a 0.01-inch gap between fuel tube corners. The effective conductivities for fuel tube corner are determined by using a two-dimensional fuel tube corner model as presented in Section 4.11.1.7.2. In the model, the parts like corner support bar, ridge gusset and side support weldment are not modeled conservatively. An emissivity of 0.5 is used for TSC shell surfaces, 0.32 is used for the outer surfaces of the basket walls and 0.75 is used for the channel surfaces facing the basket walls.

The fuel assemblies are modeled as homogeneous regions with effective properties. Using the methodology described in Section 4.4.1.3 with two dimensional ANSYS models, the effective properties are calculated for the fuel assemblies in the zircaloy channel. The parameters corresponding to the BWR 10×10 fuel assemblies are used. In the axial direction, the fuel region is subdivided into three sections to reflect the location of the active fuel region with the

associated heat generation and fuel regions above and below the active fuel regions. The three separate fuel regions are shown in Figure 4.11-17.

To account for the resistance to the flow in the fuel region inside the channel due to wetted perimeter of the fuel region, the porous media option for fluids is used. The resistance to flow due to the fuel rods and fuel assembly grids is represented in terms of the pressure drop included in the momentum equations for each cell in the model associated with porous media. The porous constants are calculated using the method described in Section 4.8.2. Note that the porous media is not used for the downcomer helium region and the helium between the basket wall and channel. The helium in these regions is conservatively modeled as laminar flow.

The thermal boundary condition from two-dimensional evaluation using the model described in Section 4.11.1.1.2 is used. The heat generation for the fuel is applied to the active fuel region of the TSC model according to the heat load patterns (89B-A, 89B-B and 89B-C) as shown in Figures 4.11-4 through 4.11-6. The individual heat load in each fuel channel is applied according to the axial power distribution shown in Figure 4.4-4. For flexible uniform heat load pattern 89B-A, equal heat load is applied in all the fuel regions.

4.11.1.2.3 Three-Dimensional TSC Models for BWR DF Configuration

As shown in Figures 4.11-20 to 4.11-22, an eighth-symmetry TSC model is used for BWR DF configuration. The model is similar to the model for BWR configuration presented in Section 4.11.1.2.2. The main difference is the reduced number of fuel slots (i.e. 81). Like the BWR configuration, the dimensions of the basket, channel and fuel regions are same except for the corner slots for damaged fuels. The damaged fuel slots at the basket corner are slightly larger with ID of 6.52-inch and the basket walls which are slightly thicker as shown in Figure 4.11-20. In the eighth-symmetry model shown in Figure 4.11-20, the damaged fuel cans are modeled in one and half damaged fuel slots. The helium gaps between the damaged fuel can and damaged fuel basket are conservatively modeled as static helium.

The basket wall and basket wall joint properties are same as the one for BWR configuration in Section 4.11.1.2.2. The fuel assemblies and their properties are same as described in Section 4.11.1.2.2. The resistance to the flow in the fuel region (except DF) is also accounted in the same method as in Section 4.11.1.2.2. The DF can is modeled to be the same height as other fuel assemblies. The fuel in the DF can is considered to be 50% compaction. Hence, the damaged fuel height is modeled as 86.5 inches (at bottom) and the remaining region in DF can is modeled as static helium as shown in Figure 4.11-21.

The heat generation for the fuel is applied to the active fuel region of each fuel and compacted fuel region in DF can according to the heat load patterns (81B-A, 81B-B and 81B-C) as shown in

Figures 4.11-7 through 4.11-9. The individual heat load in each fuel slot is applied according to the axial power distribution shown in Figure 4.4-4. For the fuel region in DF can, the heat generation is uniform. For flexible heat load pattern 81B-A, equal heat load is applied in all the fuel regions including DF can.

The total heat loads for BWR and BWR DF configurations are same for three patterns A, B and C. Moreover, the heat load patterns are also similar between the two configurations. Hence, the thermal difference at the TSC outer surfaces are not significant enough to affect the thermal results inside the TSC significantly. Hence, the thermal boundary condition from two-dimensional evaluation using the model for BWR configuration described in Section 4.11.1.1.2 is used for this evaluation as well.

4.11.1.3 Three-Dimensional Concrete Cask and TSC Models for All Inlets Blocked Condition

This section describes the three-dimensional finite volume models used to evaluate the thermal performance of the concrete cask and TSC for the PWR and BWR fuel configurations during all air inlets blocked condition. A quarter-symmetry model is used for the PWR configuration and an eighth-symmetry model is used for the BWR and BWR-DF configurations. All models consist of the three-dimensional TSC models as discussed in Section 4.11.1.2, with the concrete cask added to the outside of TSC. The added components include the following:

- Air annulus
- Carbon steel liner
- Heat shield
- Concrete Cask (Side and Top)

The air in the annulus is modeled as static, and because there is no airflow, the components below the TSC bottom plate are not modeled. The eighth-symmetry model (a view of the symmetry plane) for the BWR configuration is shown in Figure 4.11-23. The three-dimensional models used for PWR and BWR DF configurations are similar to the BWR model and, therefore, are not shown. The bottom surfaces of both the TSC and the concrete cask are conservatively modeled as adiabatic.

4.11.1.3.1 Three-Dimensional Concrete Cask and TSC Models for All Inlets Blocked -PWR

A quarter-symmetry three-dimensional concrete cask and TSC model is used for the transient analysis for the all inlet blocked condition for PWR configuration. The model contains the TSC model as discussed in Section 4.11.1.2.1 with the air annulus and the concrete cask added as previously discussed.

4.11.1.3.2 Three-Dimensional Concrete Cask and TSC Models for All Inlets Blocked -BWR

An eighth-symmetry three-dimensional concrete cask and TSC model is used for the transient analysis for the all inlet blocked condition for BWR configuration. The model contains the TSC model as discussed in Section 4.11.1.2.2 with the air annulus and the concrete cask added as previously discussed.

4.11.1.3.3 Three-Dimensional Concrete Cask and TSC Models for All Inlets Blocked -BWR DF

An eighth-symmetry three-dimensional concrete cask and TSC model is used for the transient analysis for the all inlet blocked condition for BWR DF configuration. The model contains the TSC model as discussed in Section 4.11.1.2.3 with the air annulus and the concrete cask added as previously discussed.

4.11.1.4 Three-Dimensional Transfer Cask and TSC FLUENT Models

This section describes the three-dimensional finite volume models used to perform thermal analyses for the Lightweight MAGNASTOR Transfer Cask (LMTC) and TSC for the transfer operations of the TSC. All models consist of the three-dimensional TSC models as discussed in Section 4.11.1.2, with the LMTC added to the outside of TSC. The added components include the following:

- LMTC
- Annulus region with water or air

During the operational sequence of TSC loading, an Annulus Circulating Water Cooling System (ACWS) is used to flow water through the annulus to provide heat rejection from the TSC shell surface. In these models, the ACWS is simulated with the inlet water velocity specified based on 40 GPM flowing up in the annulus and water temperature of 70 °F. ACWS is considered to be in operation for all the analyses expect the Transfer Phase. The water in LMTC is modeled as solid medium for operational ACWS.

Figures 4.11-24 and 4.11-25 show the LMTC and TSC model used for BWR fuel configuration. The TSC and its contents are same as the three-dimensional TSC model described in Section 4.11.1.2, with the LMTC added to the model. The models for PWR and BWR DF fuel configurations are similar to the BWR model and, therefore, are not shown.

The different phases during the transfer operation are described below.

Water Phase

Steady state analyses are performed for the water phase (TSC is filled with water) for PWR, BWR and BWR-DF for three heat load patterns for each configuration as shown in Figures 4.11-1 through 4.11-9. The fluid zone in the TSC is modeled as water. The effective thermal conductivities corresponding to the water for each fuel configuration are used for the fuel regions. Water flows up in the annulus with 40 GPM and an inlet water temperature of 70 °F. All the exterior of the TSC and the LMTC facing ambient are conservatively modeled as adiabatic.

Vacuum Drying Phase

Steady state analyses are performed for the vacuum phase of the TSC for all three fuel configurations and three heat loads for each configuration. The medium inside the TSC is modeled as helium with no buoyant effect. Effective thermal conductivities corresponding to helium are used for the fuel regions. All the exterior surfaces of the TSC and LMTC facing ambient are conservatively modeled as adiabatic. The purpose of these analyses is to obtain the temperature profiles of the TSC shell surface to be applied as the boundary conditions of the three-dimensional TSC ANSYS models for the transient analyses for vacuum condition as described in Section 4.11.1.5.

Cooldown/Helium Phase

Transient analyses are performed for the cooldown/helium phase (TSC is backfilled with pressurized helium) for the bounding heat load patterns for PWR (37P-I and 37P-K) and BWR (89B-A and 89B-B). The analysis is performed for 24 hours for the Tech Specification requirement of 24 hours cooldown if dryness is not achieved by the vacuum drying of TSC. The initial condition is the final state of the vacuum drying, determined by the three-dimensional TSC ANSYS model in Section 4.11.1.5. The medium inside the TSC is helium with an average helium density of 0.76 g/L. Effective thermal properties are used in the fuel region. All the surfaces in TSC and LMTC facing ambient are conservatively modeled as adiabatic. In addition, steady state analyses are performed for the helium backfilled condition of TSC for all fuel configuration and all heat load patterns as shown in Figures 4.11-1 through 4.11-9.

Transfer Phase

Transient analyses are performed for the transfer phase (TSC is backfilled with helium and being transferred to the concrete cask) for the bounding heat load patterns 37P-I and 37P-K for PWR, as shown in Figures 4.11-1 and 4.11-3, respectively. Similarly, transient analyses are performed for the transfer phase for the bounding heat load patterns 89B-A and 89B-B for BWR, as shown in Figures 4.11-4 and 4.11-5, respectively. During this phase, the annulus is filled with air and the ACWS is not in operation. The analysis is performed for 16 hours and 22 hours for PWR and

BWR, respectively. The initial condition for the analysis is the state of Cooldown/Helium phase at 12 hours. The pressure inlet and outlet boundary condition are applied with zero gauge pressure. The medium inside the TSC is helium with an average density of 0.76 g/L. Fuel regions are modeled as porous media zones. Effective thermal properties are used in the fuel regions. For the transfer phase, the LMTC with water layer of 3.05 inch (as fluid) is modeled. Natural [redacted]

4.11.1.4.1 Three-Dimensional Transfer Cask and TSC FLUENT Models for PWR Configuration

A three-dimensional quarter-symmetry transfer cask and TSC model is used to perform steady state and transient analyses for the PWR configuration. The model consists of the three-dimensional TSC model as discussed in Section 4.11.1.2.1 with the LMTC and the annulus region added to the model.

4.11.1.4.2 Three-Dimensional Transfer Cask and TSC FLUENT Models for BWR Configuration

For the transfer operation of the BWR configuration, two three-dimensional eighth-symmetry models are used. The difference in these two models is mainly the modeling of basket wall inside the TSC. For the transient analysis (cooldown and transfer phase), the model consists of the TSC model as discussed in Section 4.11.1.2.2 with the annulus for water/air and LMTC added to the outside of the TSC, as shown in Figures 4.11-24 and 4.11-25. In this model, the basket wall, helium gap and zircaloy channel for the model for transient analyses are modeled explicitly

For steady state analyses (water, helium and vacuum phase), the model is essentially the same as the model for the transient analysis except that the basket wall (with neutron absorber), helium gap and zircaloy channel are modeled as single material with effective properties. The effective conductivity evaluation of the basket wall is discussed later in Section 4.11.1.6.2.

4.11.1.4.3 Three-Dimensional Transfer Cask and TSC FLUENT Models for BWR-DF Configuration

A three-dimensional eighth-symmetry transfer cask and TSC model is used to perform steady state analyses for the BWR configuration. The model consists of the three-dimensional TSC model as discussed in Section 4.11.1.2.3 with the LMTC and the annulus region added to the model.

4.11.1.5 Three-Dimensional TSC ANSYS Models

Finite element models for the vacuum drying analyses of MAGNASTOR system with heat load over 35.5 kW (up to 42.5 kW) for the PWR system and heat load over 33 kW (up to 42 kW) for the BWR system are presented in this Section. Three different heat load patterns are used for PWR configuration. Three different heat load patterns for BWR are utilized for the BWR model. Also, three different heat load patterns for BWR DF are used for BWR DF model.

4.11.1.5.1 Three-Dimensional TSC ANSYS Models for PWR Configuration

The three-dimensional quarter symmetry TSC ANSYS model is used to perform transient analyses to calculate the fuel and basket temperatures in the TSC during vacuum drying condition. The model is shown in Figure 4.11-26. The model includes the following:

- TSC shell, lid and bottom plate
- Fuel basket
- Fuel assemblies

Modeling methodology of this model is identical to the three-dimensional ANSYS model shown in Figure 4.4-16 and Figure 4.4-17 for PWR fuel as described in Section 4.4.1.5. Effective properties are used for the fuel regions and the neutron absorber regions in the model. Note that the minimum effective thermal conductivity corresponding to Type 2 neutron absorber in Table 8.3-27 is used to determine the effective properties.

The analyses are performed for all three heat load patterns for PWR as shown in Figures 4.11-1 through 4.11-3. The following boundary conditions are used in the model:

- The top of the canister lid is modeled with convection film coefficient for horizontal surface.
- The two-dimensional temperature profiles of TSC shell outer surface (vacuum condition simulation) from steady state analyses using the three-dimensional transfer cask and TSC FLUENT model (Section 4.11.1.4) are applied as temperature boundary condition on TSC shell surface.
- The outer surface of TSC bottom plate is conservatively considered to be adiabatic.

The maximum fuel temperature from steady state analysis for the water phase using the three-dimensional MTC and TSC FLUENT model is conservatively used as the initial temperature for the entire model.

4.11.1.5.2 Three-Dimensional TSC ANSYS Models for BWR Configuration

The three-dimensional one-eighth symmetry TSC ANSYS model is used to perform transient analyses to calculate the fuel and basket temperatures in the TSC during vacuum drying condition. The model is shown in Figure 4.11-27. The model includes the following:

- TSC shell, lid and bottom plate
- Fuel basket
- Fuel assemblies

Modeling methodology of this model is identical the three-dimensional ANSYS model shown in Figure 4.4-18 and Figure 4.4-19 for BWR fuel as described in Section 4.4.1.5. The only difference is that the loaded basket above the active fuel region and the helium on top of the basket are conservatively not modeled, in which the only heat transfer is radiation by using a radiation matrix. Effective properties are used for the fuel regions and the neutron absorber regions in the model. Note that the minimum effective thermal conductivity corresponding to Type 2 neutron absorber in Table 8.3-27 is used to determine the effective properties.

The analyses are performed for all three heat load patterns as shown in Figures 4.11-4 through 4.11-6. The following boundary conditions are used in the model:

- The top of the canister lid is modeled with convection film coefficient for horizontal surface.
- Temperature profiles of TSC shell outer surface (vacuum condition simulation) from steady state analyses using the three-dimensional transfer cask and TSC FLUENT model (Section 4.11.1.4) are applied as temperature boundary condition on TSC shell surface.
- A constant temperature is conservatively applied on outer surface of TSC bottom plate. The applied temperatures are the maximum bottom plate temperature from the steady state analyses for the water condition simulation using the three-dimensional transfer cask and TSC FLUENT model (Section 4.11.1.4).

The maximum fuel temperature from steady state analysis for the water phase using the three-dimensional MTC and TSC FLUENT model is conservatively used as the initial temperature for the entire model.

4.11.1.5.3 Three-Dimensional TSC ANSYS Models for BWR DF Configuration

The three-dimensional one-eighth symmetry TSC ANSYS model for BWR DF configuration is used to perform transient analyses to calculate the fuel and DF basket temperatures in the TSC during vacuum drying condition. The model is shown in Figures 4.11-28 and 4.11-29. The model includes the following:

- TSC shell, lid and bottom plate
- DF Fuel basket
- Fuel assemblies

Modeling methodology of this model is similar to the three-dimensional ANSYS model shown in Figure 4.4-18 and Figure 4.4-19 for BWR fuel as described in Section 4.4.1.5. The BWR DF basket has 81 slots and damage fuel cans can be loaded in 12 corner slots as shown in Figure

4.11-7 through Figure 4.11-9. The damage fuel height is determined based on a 50% compaction. The gaps between the corners of basket plates is conservatively modeled as 0.0168 in. (compared with 0.01in.). The loaded basket above the active fuel region and the helium on top of the basket are conservatively not modeled. The only heat transfer between top of the basket modeled and the canister lid is radiation using radiation matrix. Effective properties are used for the fuel regions and the neutron absorber regions in the model. Note that the minimum effective thermal conductivity corresponding to Type 2 neutron absorber in Table 8.3-27 is used to determine the effective properties.

The analyses are performed for all four heat load patterns for BWR DF as shown in Figures 4.11-7 through 4.11-9. The following boundary conditions are used in the model:

- The top of the canister lid is modeled with convection film coefficient for horizontal surface.
- Temperature profiles of TSC shell outer surface (vacuum condition simulation) from steady state analyses using the three-dimensional transfer cask and TSC FLUENT model (Section 4.11.1.4) are applied as temperature boundary condition on TSC shell surface. The temperature profile for corresponding pattern of BWR is used for DF configuration since the heat loads for BWR are equal to or larger than the heat loads for BWR DF.
- A constant temperature for BWR is applied on outer surface of TSC bottom plate since the heat loads for BWR are equal to or larger than the heat loads for BWR DF. The applied temperatures are the maximum bottom plate temperature from the steady state analyses for the water condition simulation using the three-dimensional transfer cask and TSC FLUENT model (Section 4.11.1.4).

The maximum fuel temperature from steady state analysis for the water phase using the three-dimensional MTC and TSC FLUENT model is conservatively used as the initial temperature for the entire model. The initial temperature for BWR for corresponding pattern is used for DF configuration since the heat loads for BWR are equal to or larger than the heat loads for BWR.

4.11.1.6 Two-Dimensional Fuel Tube Wall Models

The two-dimensional models are used to determine the effective conductivities of the fuel tube wall with the neutron absorber used in the three-dimensional models. The two-dimensional models for PWR and BWR configurations are described in the following sections.

4.11.1.6.1 Two-Dimensional Fuel Tube Wall Models for PWR Configuration

The two-dimensional fuel tube wall ANSYS model is used to determine the effective thermal conductivities of the fuel tube wall with the neutron absorber used in the three-dimensional quarter symmetry models in Sections 4.11.1.2 through 4.11.1.4 for PWR configuration. As shown in Figure 4.11-30, the model includes one side wall of the fuel tube and the neutron

absorber region. In the model, the tube wall is modeled as carbon steel and the neutron absorber region is modeled using effective conductivities determined by the two-dimensional neutron absorber models presented in Section 4.4.1.4. Note that neutron absorber material effective thermal conductivity corresponding to the conductivity values for Type 2 absorbers listed in Table 8.3-27 is used.

Heat flux is applied to the left side of tube wall and varying temperature from 100°F to 800°F is applied as boundary condition on right side of tube wall to calculate effective conductivity in X direction (see Figure 4.11-30). Similarly, to calculate the effective conductivity in Y direction (see Figure 4.11-30), heat flux is applied on the top surface and varying temperature is applied on the bottom surface. Effective properties are calculated using equations below.

$q = K_{xx/yy} (A/L) \Delta T$

where:

- $K_{xx/yy}$ ---------- effective conductivity (Btu/hr-in-°F) in X or Y direction
- q ---------- heat rate (Btu/hr)
- A ---------- area (in^2) in X or Y direction
- L ---------- length (thickness) of model (in.) in X or Y direction
- ΔT ---------- temperature difference across the model (°F)

The temperature-dependent conductivity is determined by varying the temperature constraints at one boundary of the model and solving for the temperature difference. The effective conductivity for the parallel path (the Z direction in Figure 4.11-17) is calculated by the following.

$$K_{zz} = \frac{\sum K_i t_i}{L}$$

where:

- K_i ---------- thermal conductivity of each layer (Btu/hr-in-°F)
- t_i ---------- thickness of each layer (in)
- L ---------- total length (thickness) of the model (in)

4.11.1.6.2 Two-Dimensional Fuel Tube Wall Models for BWR Configuration

The two-dimensional fuel tube wall FLUENT models are used to determine the effective thermal conductivities of the fuel tube wall. Two different types of models are used.

The first model includes the carbon steel tube, neutron absorber and retainer with helium gaps. Figure 4.11-31 shows the model with all the layers of materials included in the computation of effective tube wall properties. The helium gaps are modeled as solid helium. The total thickness of the basket wall is 0.378 inches. This effective wall is used in all BWR and BWR-DF models except for steady state analysis of transfer operation (i.e. Water phase, vacuum phase and helium phase) for BWR configuration.

The second model includes the carbon steel tube, neutron absorber and retainer on one side, helium gaps and zircaloy channels on both sides of steel tube. Figure 4.11-32 shows the model with all the layers of materials included in the computation of effective tube wall properties. The helium gaps are modeled as solid helium. Since the helium gaps between the basket wall and the zircaloy channel are modeled as solid, the convection of helium in the gap is neglected which makes the effective conductivity conservative. The three-dimensional model with this fuel tube wall is used for steady state analysis of transfer operation (i.e. Water phase, vacuum phase and helium phase) for BWR configuration only.

To calculate the effective properties along x-direction (Figures 4.11-31 and 4.11-32), the higher temperature is applied on the right side of the carbon steel tube whereas 4 °F lower temperature is applied on the left side of the carbon steel tube. For example, the temperatures of 102 °F and 98 °F are applied on two surfaces to achieve the effective properties at 100 °F. All other surfaces are made adiabatic. Similarly, to calculate the effective properties along y-axis (Figures 4.11-30 through 4.11-32), the higher and lower temperatures are applied on top and bottom surfaces, respectively. All side surfaces are modeled as adiabatic.

The effective conductivity in both directions are calculated based on steady state conduction equation as shown in Section 4.11.1.6.1. Similarly, the temperature dependent effective conductivity in z-direction calculated as described in Section 4.11.1.6.1.

4.11.1.7 Two-Dimensional Fuel Tube Corner Models

The two-dimensional models are used to determine the effective conductivities of the fuel tube corners with diagonal helium gaps. The helium gaps are modeled as static helium with radiation heat transfer across them. The two-dimensional models used for PWR and BWR fuel configuration are described in the following sections.

4.11.1.7.1 Two-Dimensional Fuel Tube Corner Models for PWR Configuration

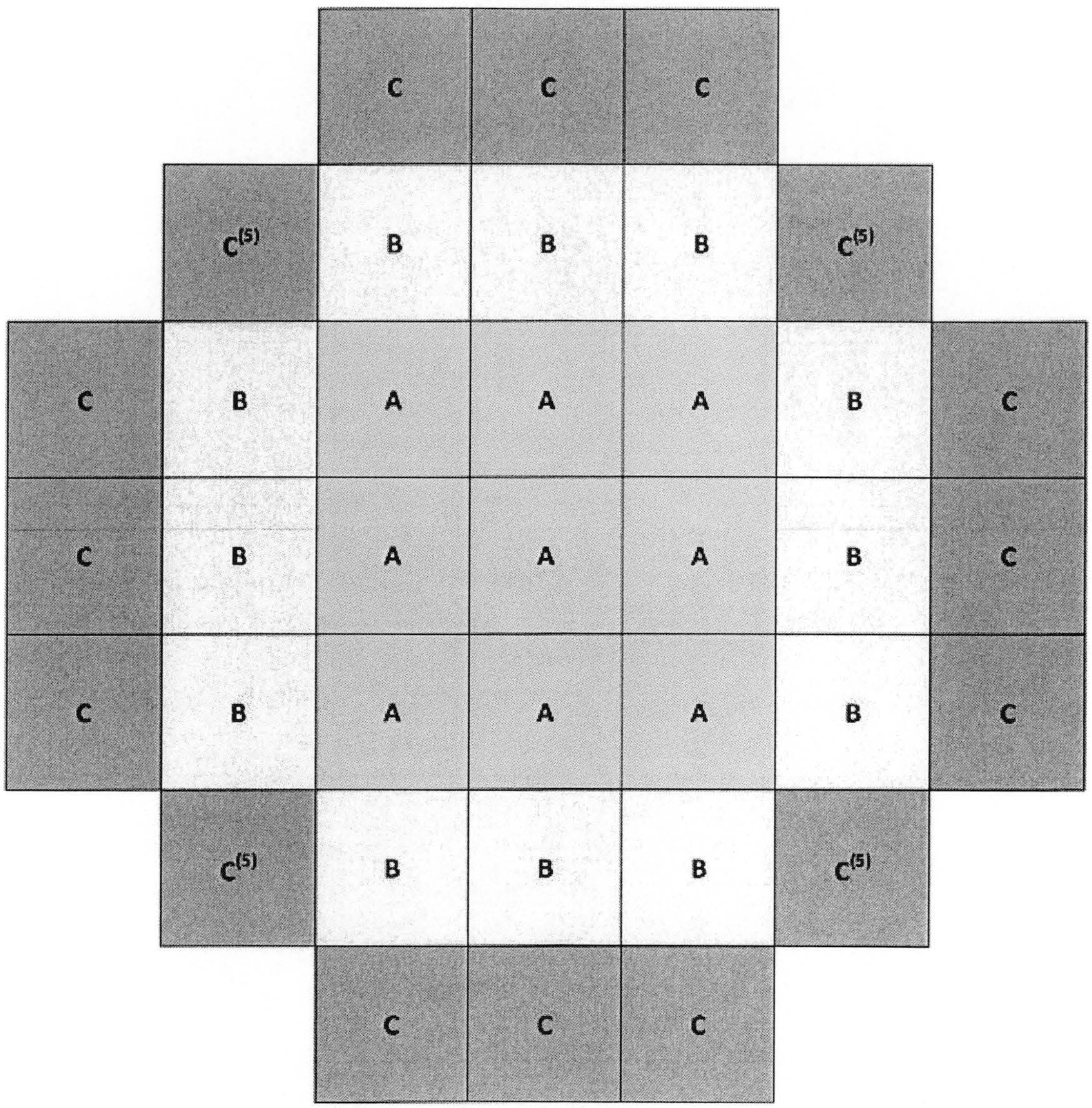
The two-dimensional model used to determine the effective conductivities of tube corner for PWR configuration is shown in Figure 4.11-33. The tube thickness of 0.3125 inch is used. A constant heat flux is applied at the bottom surface of the model. The varying temperatures from

100 °F to 800 °F are applied on the top surface. The equations shown in Section 4.11.1.6.1 are used to calculate the effective orthotropic conductivity.

4.11.1.7.2 Two-Dimensional Fuel Tube Corner Models for BWR Configuration

[redacted]

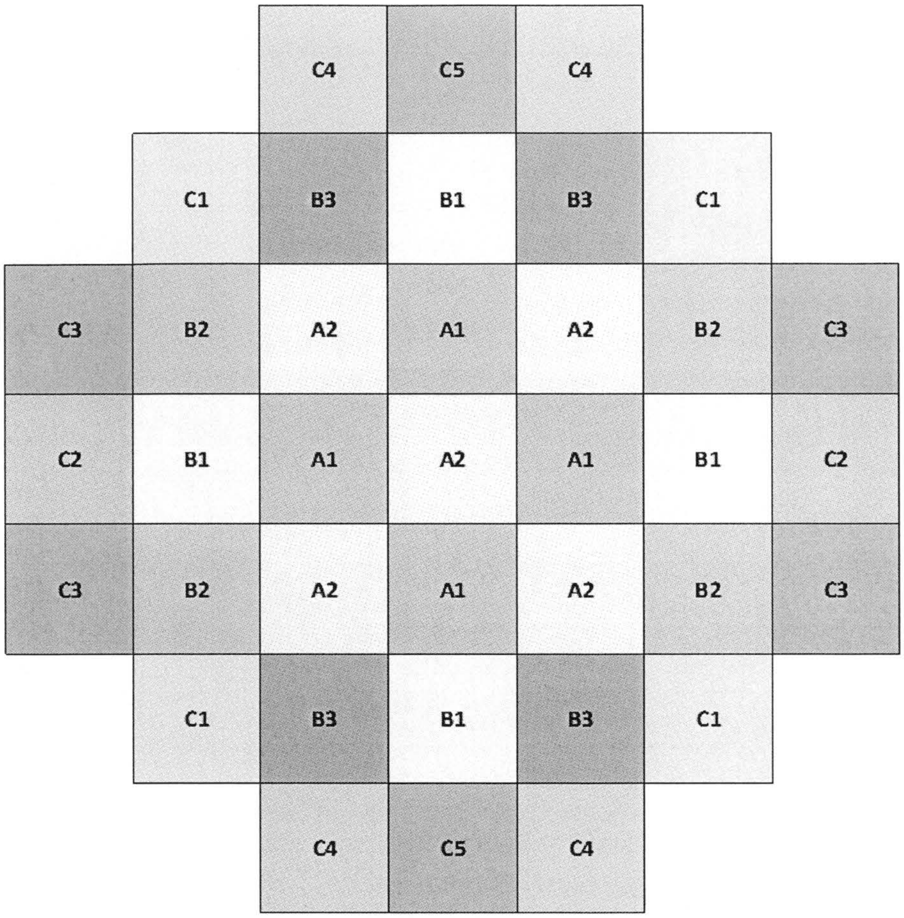
Figure 4.11-1 37-PWR and DF 37-PWR TSC Flexible Uniform Load Pattern 37P-I



Note:

(1) 1,149 W applied in each cell (A, B, and C) for total heat load of 42.5 kW.

Figure 4.11-2 37-PWR and DF 37-PWR TSC Preferential Load Pattern 37P-J



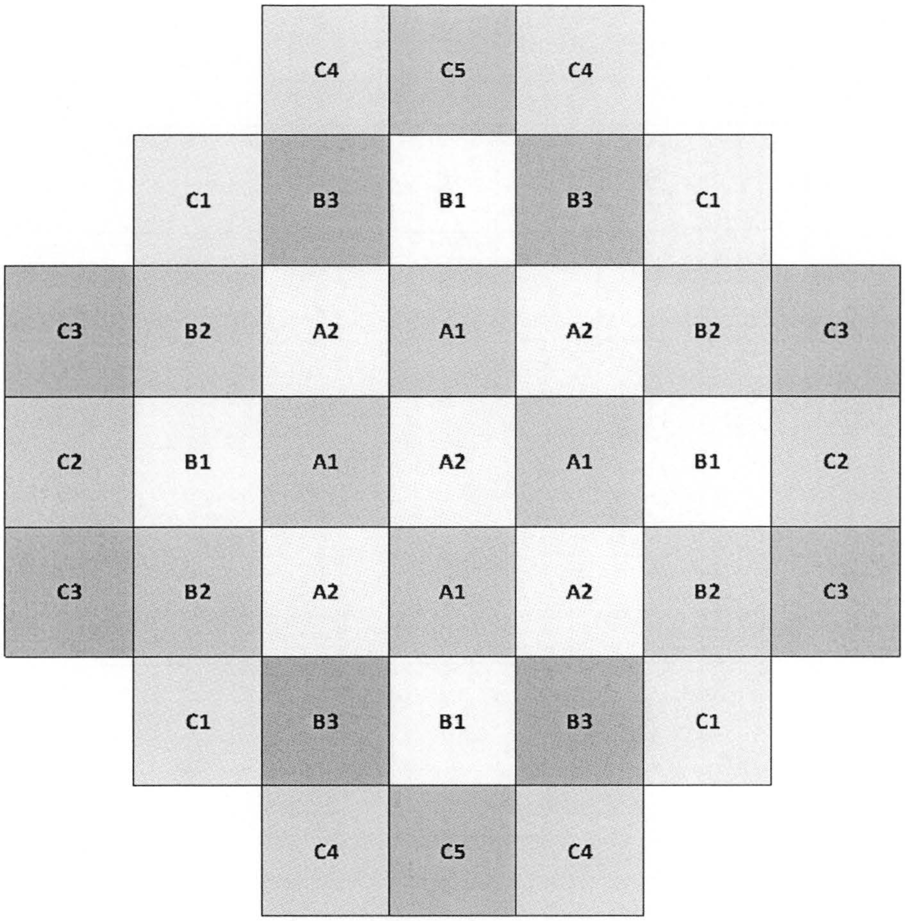
Zone	# FA	Heat Load Limits (watts)	
		Max. Assy.	Max. Total Zone
A1	4	600	2400
A2	5	400	2000
B1	4	1250	5000
B2	4	800	3200
B3	4	800	3200
C1	4	1250	5000
C2	2	800	1600
C3	4	1250	5000
C4	4	3250	13000
C5	2	800	1600
Total	37	---	42000

Notes:

(1) A2 cells may remain empty. All other cells must contain a fuel assembly or a thermal shunt treated as a fuel assembly with zero heat load.

(2) DF is permitted in C1 cells of the DF 37-PWR TSC.

Figure 4.11-3 37-PWR and DF 37-PWR TSC Preferential Load Pattern 37P-K



		Heat Load Limits (watts)	
Zone	# FA	Max. Assy.	Max. Total Zone
A1	4	600	2400
A2	5	400	2000
B1	4	700	2800
B2	4	1900	7600
B3	4	1900	7600
C1	4	800	3200
C2	2	2500	5000
C3	4	800	3200
C4	4	800	3200
C5	2	2500	5000
Total	37	---	42000

Notes:

[1] A2 cells may remain empty. All other cells must contain a fuel assembly or a thermal shunt treated as a fuel assembly with zero heat load.

[2] DF is permitted in C1 cells of the DF 37-PWR TSC.

Figure 4.11-4 89-BWR TSC Flexible Uniform Load Pattern 89B-A

				D	D	D				
		D	D	C	C	C	D	D		
	D	C	C	C	B	C	C	C	D	
	D	C	B	B	A	B	B	C	D	
D	C	C	B	A	A	A	B	C	C	D
D	C	B	A	A	A	A	A	B	C	D
D	C	C	B	A	A	A	B	C	C	D
	D	C	B	B	A	B	B	C	D	
	D	C	C	C	B	C	C	C	D	
		D	D	C	C	C	D	D		
				D	D	D				

Notes:

(1) Total heat load must not exceed 39.5 kW.

(2) Maximum assembly heat load shall not exceed 533 watts.

(3) Assemblies with highest heat loads must be stored in Zone C.

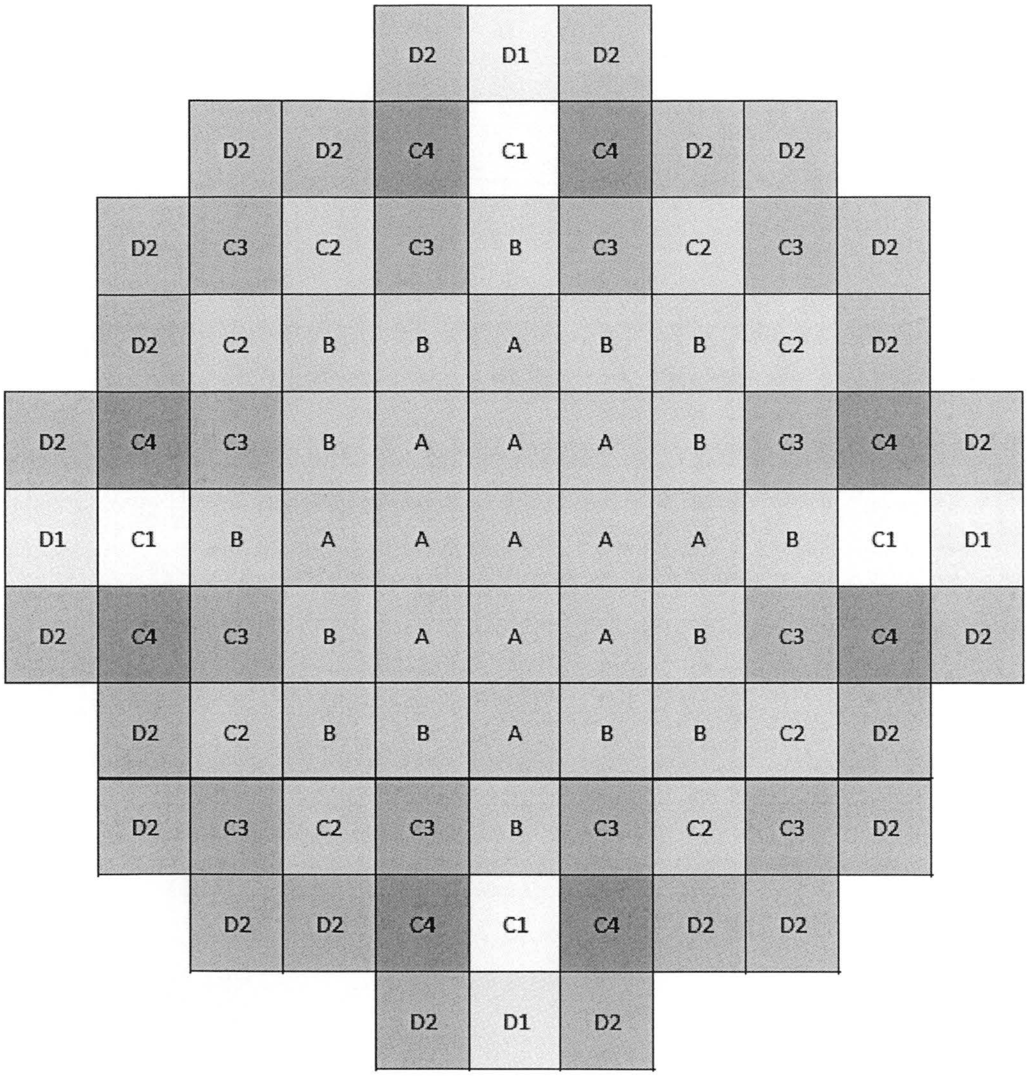
(4) Assemblies with lowest heat loads must be stored in Zones A and B.

Figure 4.11-5 89-BWR TSC Preferential Load Pattern 89B-B

				D2	D1	D2				
		D2	D2	C4	C1	C4	D2	D2		
	D2	C3	C2	C3	B	C3	C2	C3	D2	
	D2	C2	B	B	A	B	B	C2	D2	
D2	C4	C3	B	A	A	A	B	C3	C4	D2
D1	C1	B	A	A	A	A	A	B	C1	D1
D2	C4	C3	B	A	A	A	B	C3	C4	D2
	D2	C2	B	B	A	B	B	C2	D2	
	D2	C3	C2	C3	B	C3	C2	C3	D2	
		D2	D2	C4	C1	C4	D2	D2		
				D2	D1	D2				

Zone ID	Number Fuel Assy in Zone	Heat Load Limits (watts)	
		Max. Assy.	Max. Total Zone
A	13	200	2600
B	16	300	4800
C1	4	1100	4400
C2	8	950	7600
C3	12	600	7200
C4	8	350	2800
D1	4	450	1800
D2	24	450	10800
Totals	89	---	42000

Figure 4.11-6 89-BWR TSC Preferential Load Pattern 89B-C



Zone ID	Number Fuel Assy in Zone	Heat Load Limits (watts)	
		Max. Assy.	Max. Total Zone
A	13	200	2600
B	16	300	4800
C1	4	1000	4000
C2	8	900	7200
C3	12	600	7200
C4	8	450	3600
D1	4	450	1800
D2	24	450	10800
Totals	89	---	42000

Figure 4.11-7 DF 81-BWR TSC Flexible Uniform Load Pattern 81B-A

				D	D	D				
			D(5)	C	C	C	D(5)			
		D(5)	C	C	B	C	C	D(5)		
	D(5)	C	B	B	A	B	B	C	D(5)	
D	C	C	B	A	A	A	B	C	C	D
D	C	B	A	A	A	A	A	B	C	D
D	C	C	B	A	A	A	B	C	C	D
	D(5)	C	B	B	A	B	B	C	D(5)	
		D(5)	C	C	B	C	C	D(5)		
			D(5)	C	C	C	D(5)			
				D	D	D				

Notes:

(1) Total heat load must not exceed 39.5 kW.

(2) Maximum assembly heat load shall not exceed 585 watts.

(3) Assemblies with highest heat loads must be stored in Zone C.

(4) Assemblies with lowest heat loads must be stored in Zones A and B.

(5) DF is permitted in the corner cells of Zone D.

Figure 4.11-8 DF 81-BWR TSC Preferential Load Pattern 81B-B

				D2	D1	D2				
			D2(1)	C4	C1	C4	D2(1)			
		D3(1)	C2	C3	B	C3	C2	D3(1)		
	D2(1)	C2	B	B	A	B	B	C2	D2(1)	
D2	C4	C3	B	A	A	A	B	C3	C4	D2
D1	C1	B	A	A	A	A	A	B	C1	D1
D2	C4	C3	B	A	A	A	B	C3	C4	D2
	D2(1)	C2	B	B	A	B	B	C2	D2(1)	
		D3(1)	C2	C3	B	C3	C2	D3(1)		
			D2(1)	C4	C1	C4	D2(1)			
				D2	D1	D2				

Zone ID	Number Fuel Assy in Zone	Heat Load Limits (watts) Max. Assy. Heat (LBU)	Max. Assy. Heat (HBU)	Max. Total Zone Heat
A	13	300	285	3900
B	16	400	380	6400
C1	4	1100	1045	4400
C2	8	900	500	7200
C3	8	500	475	4000
C4	8	475	451	3800
D1	4	425	404	1700
D2	16	475	451	7600
D3	4	500	475	2000
Totals	81	---	---	41000

Notes:

(1) DF is permitted in the corner cells of Zone D.

Figure 4.11-9 DF 81-BWR TSC Preferential Load Pattern 81B-C

				D2	D1	D2				
			D2[1]	C4	C1	C4	D2[1]			
		D3[1]	C2	C3	B	C3	C2	D3[1]		
	D2[1]	C2	B	B	A	B	B	C2	D2[1]	
D2	C4	C3	B	A	A	A	B	C3	C4	D2
D1	C1	B	A	A	A	A	A	B	C1	D1
D2	C4	C3	B	A	A	A	B	C3	C4	D2
	D2[1]	C2	B	B	A	B	B	C2	D2[1]	
		D3[1]	C2	C3	B	C3	C2	D3[1]		
			D2[1]	C4	C1	C4	D2[1]			
				D2	D1	D2				

Zone ID	Number Fuel Assy in Zone	Heat Load Limits (watts)		
		Max. Assy. Heat (LBU)	Max. Assy. Heat (HBU)	Max. Total Zone Heat
A	13	300	285	3900
B	16	400	380	6400
C1	4	1000	950	4000
C2	8	600	570	4800
C3	8	600	570	4800
C4	8	525	499	4200
D1	4	525	499	2100
D2	16	525	499	8400
D3	4	600	570	2400
Totals	81	---	---	41000

Notes:

(1) DF is permitted in the corner cells of Zone D.

Figure 4.11-10 Two-dimensional Concrete Cask and TSC Model

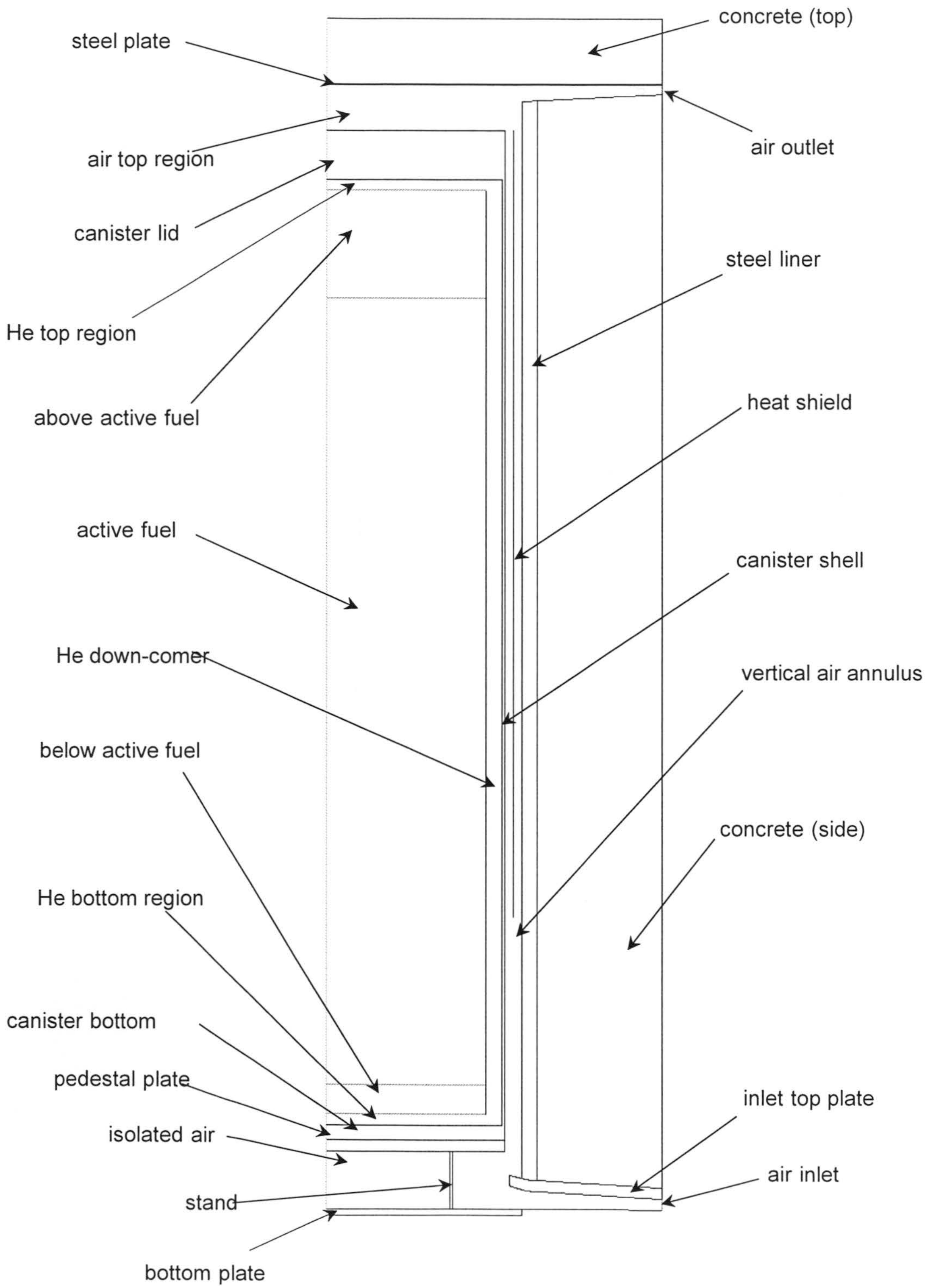


Figure 4.11-11 Mesh of the Two-dimensional Axisymmetric Cask/TSC Model

[redacted]

Figure 4.11-12 Details of the Mesh across the Vertical Air Annulus (Bottom of Shield)

[redacted]

Figure 4.11-13 Three-dimensional Quarter-symmetry TSC Model for PWR Configuration – XY Plane View

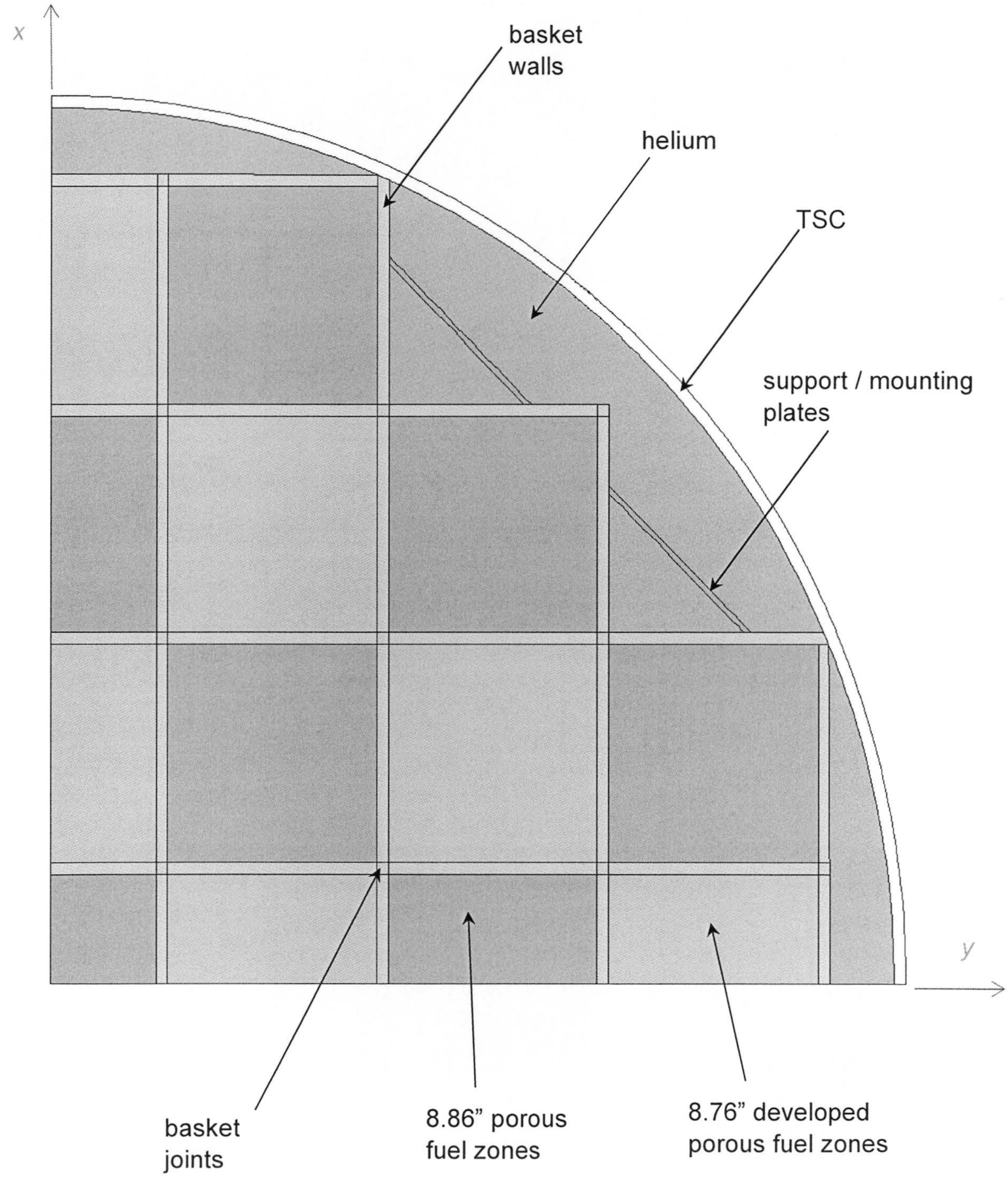


Figure 4.11-14 Three Dimensional TSC model for PWR Configuration – Symmetry Plane

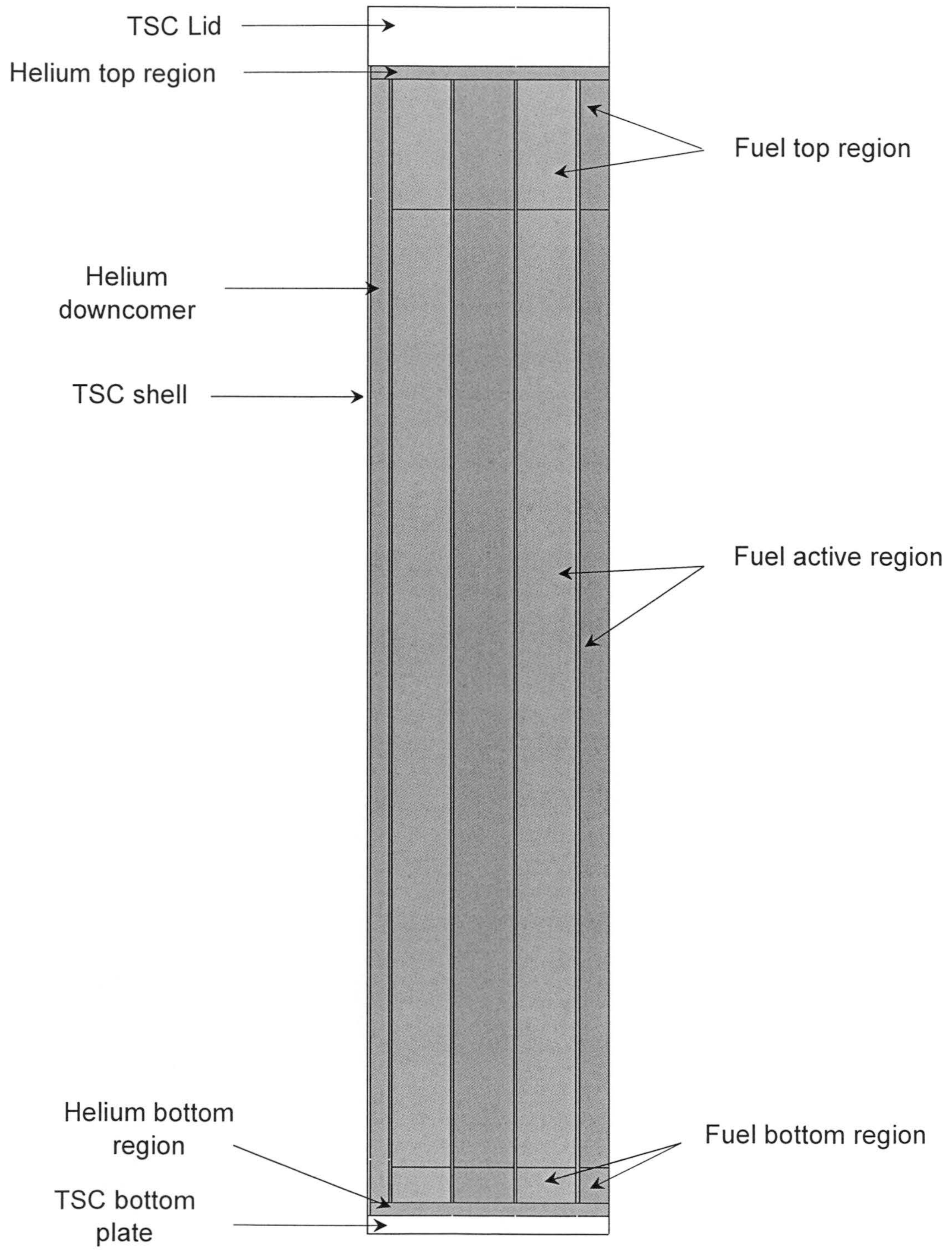


Figure 4.11-15 Mesh of Three-dimensional TSC Model for PWR configuration – XY Plane

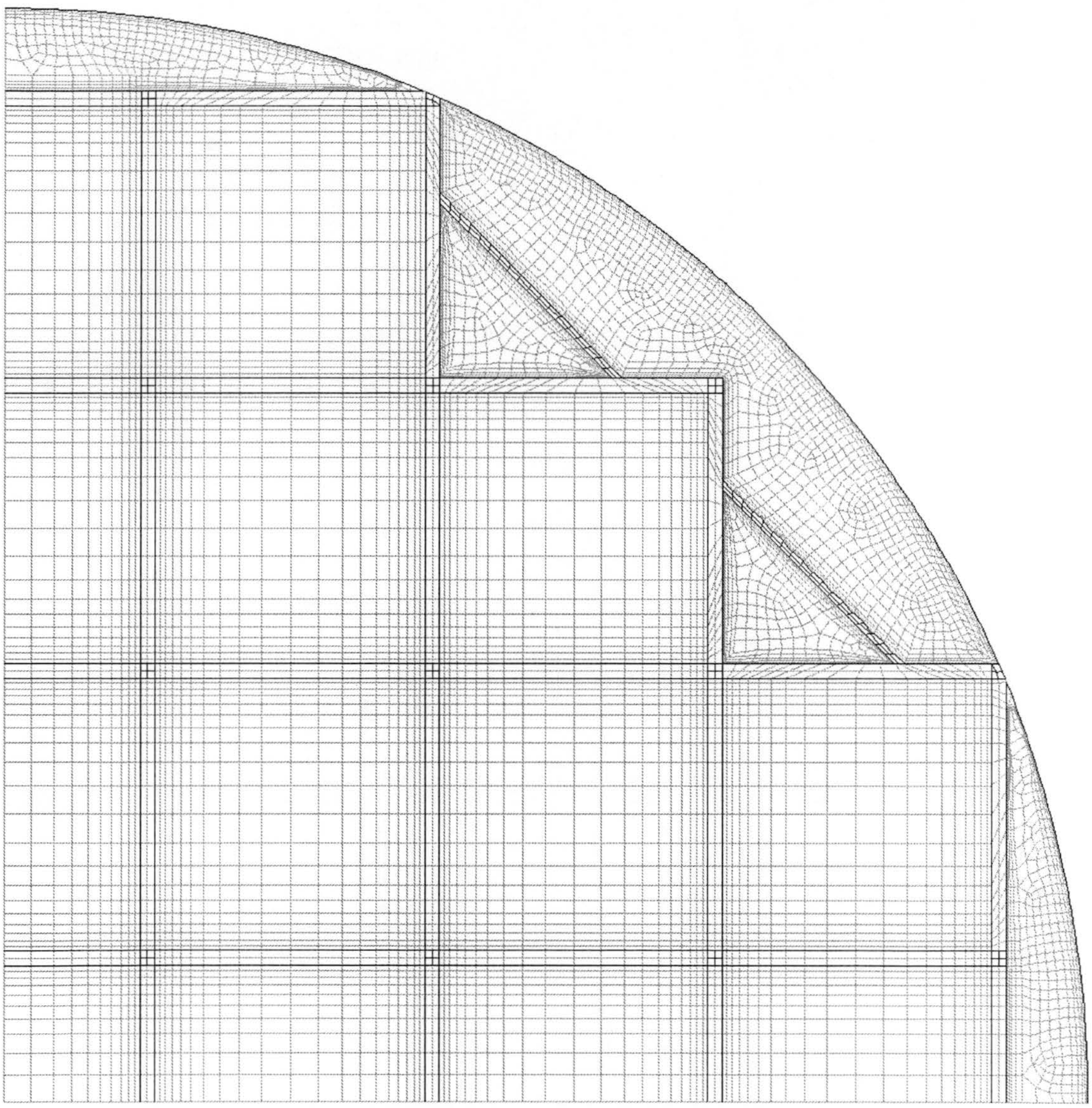


Figure 4.11-16 Three-dimensional Eighth-symmetry TSC Model for BWR Configuration - XY Plane View

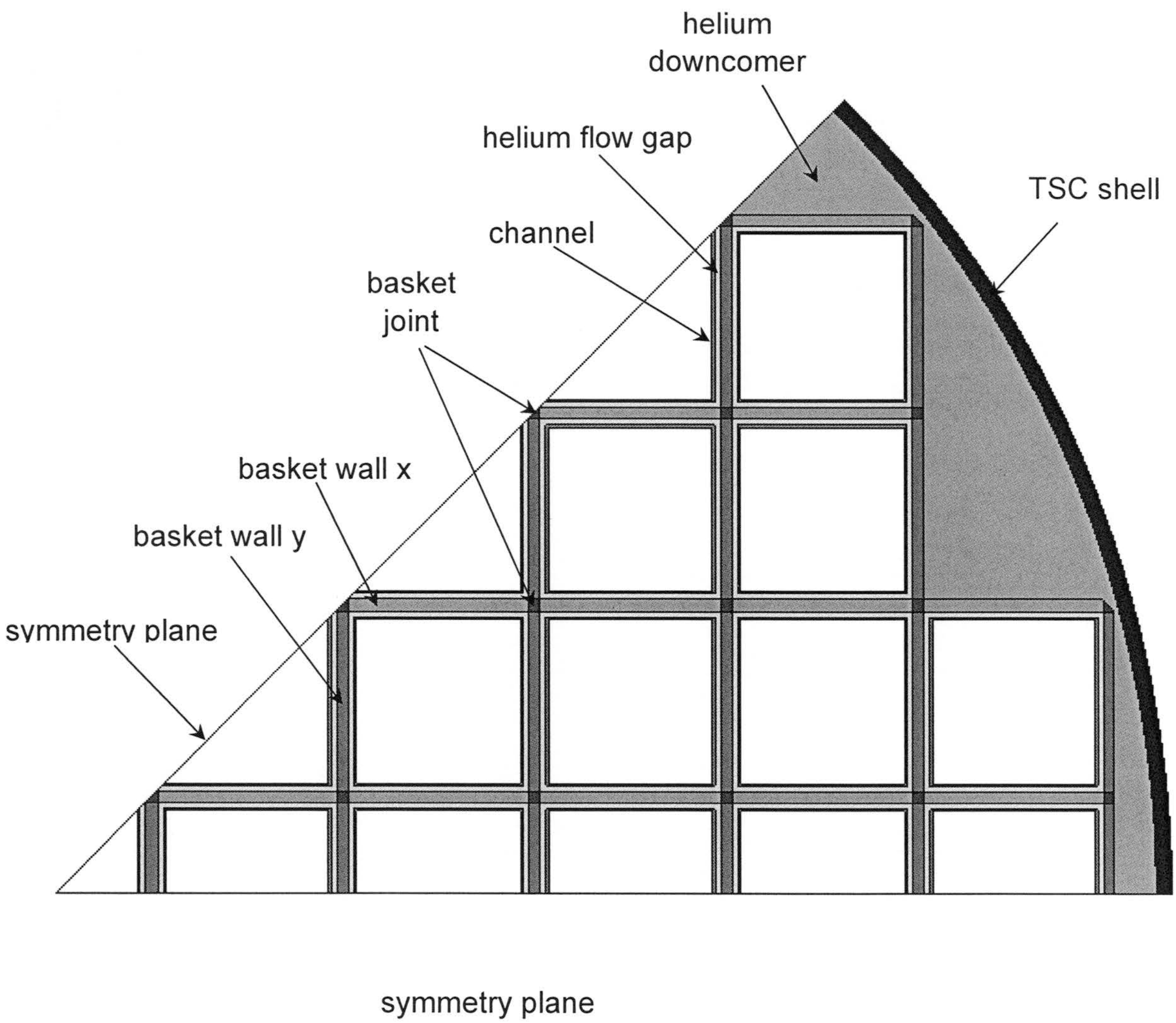


Figure 4.11-17 Three-Dimensional TSC model for BWR Configuration - Symmetry Plane View

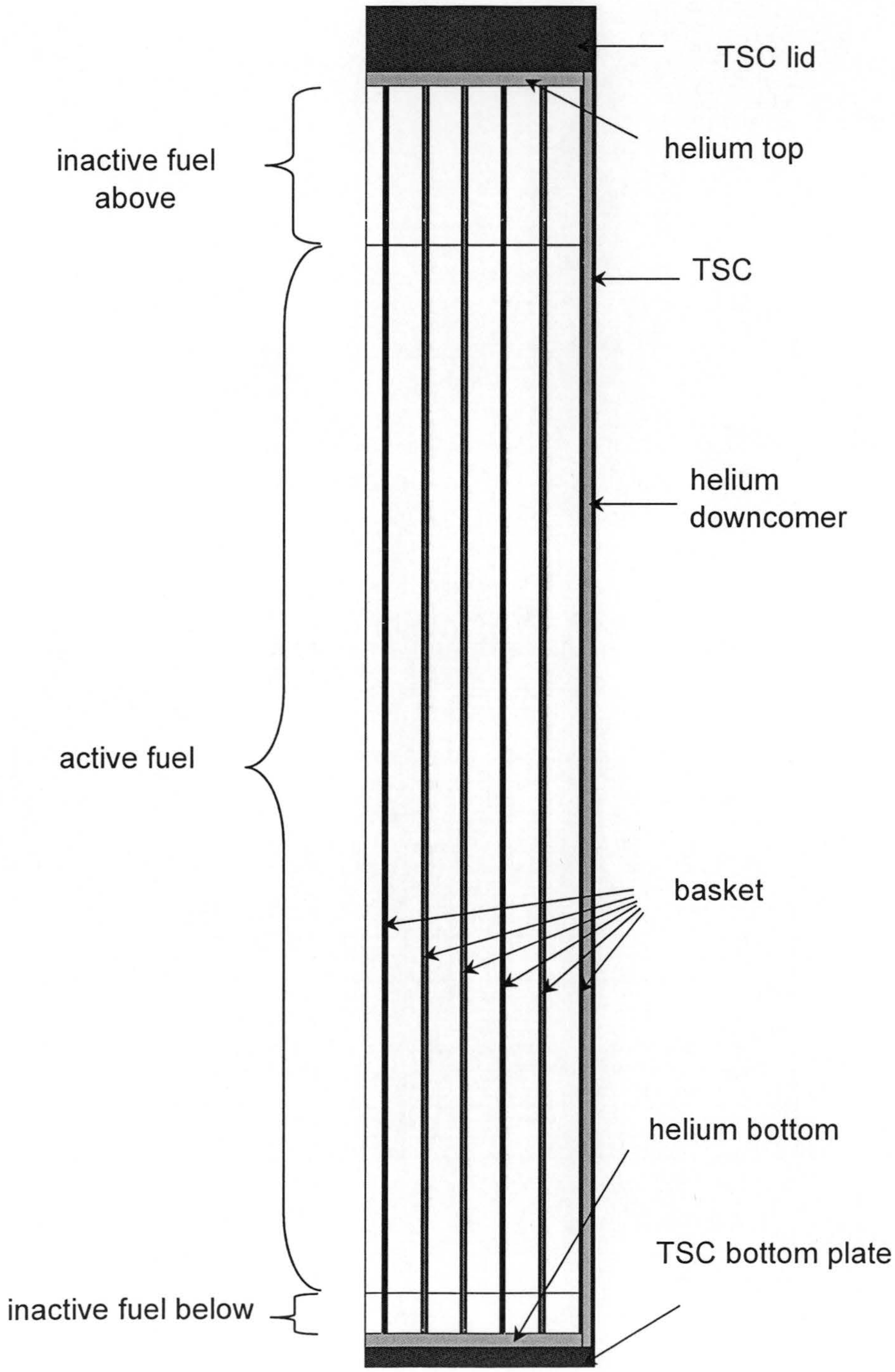


Figure 4.11-18 Mesh of Three-dimensional TSC Model for BWR configuration - XY Plane View

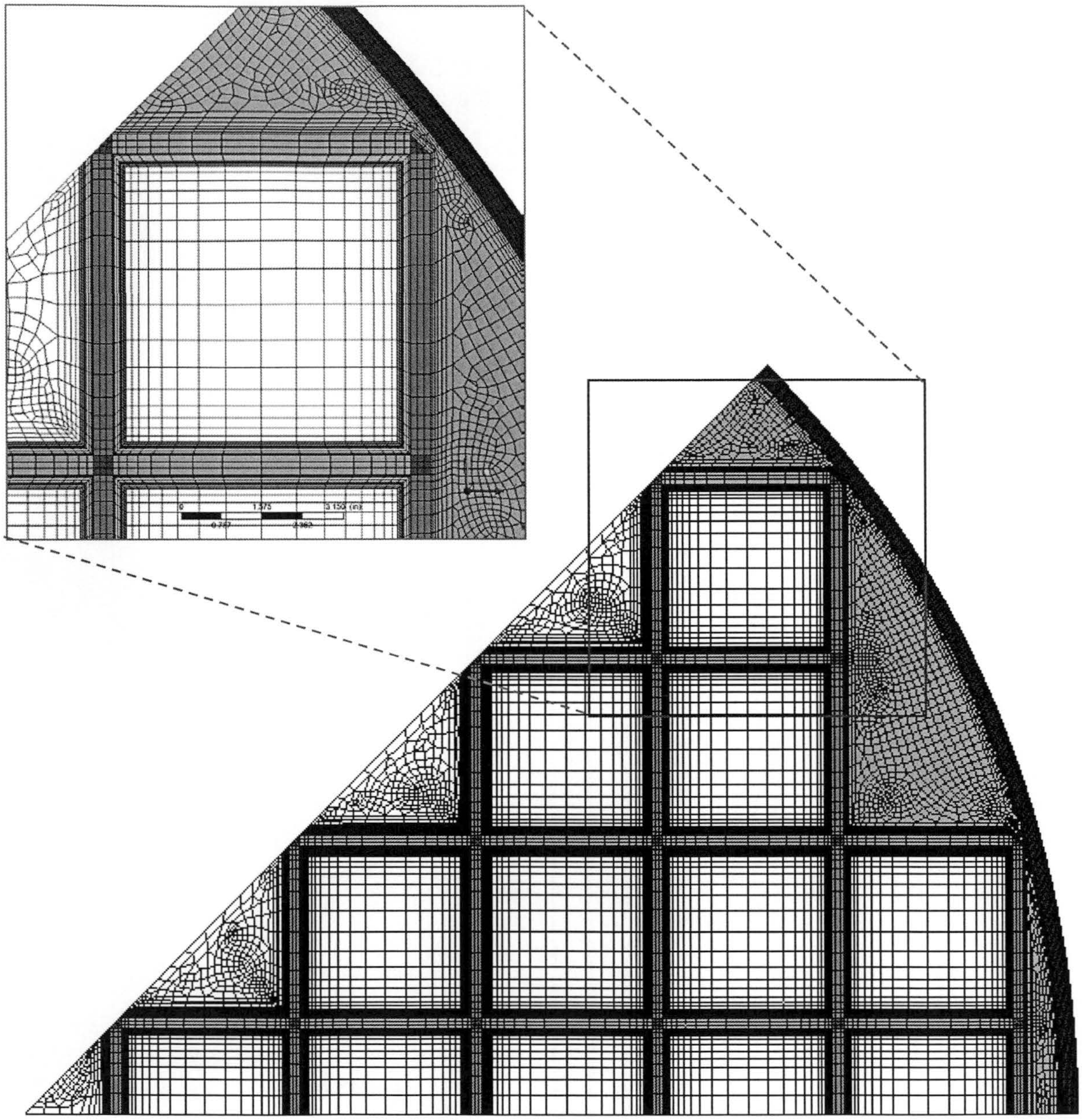


Figure 4.11-19 Mesh of Three-dimensional TSC model for BWR configuration - Symmetry Plane View

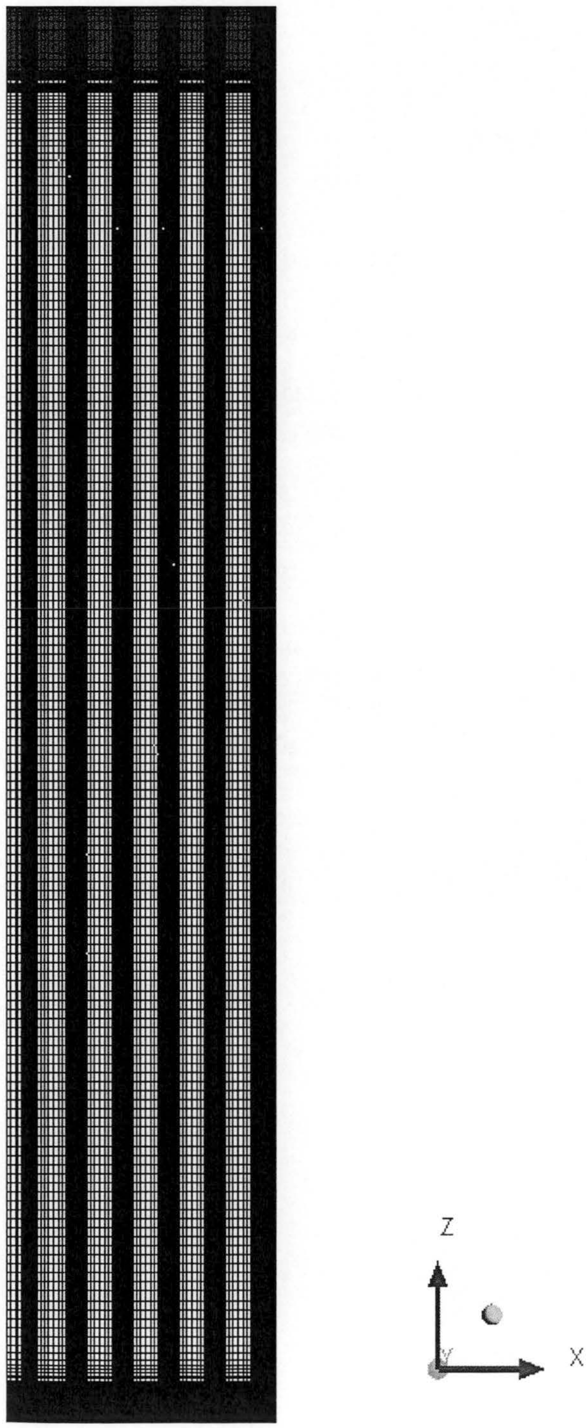


Figure 4.11-20 Three-dimensional Eighth-symmetry TSC Model for BWR DF configuration - XY Plane View

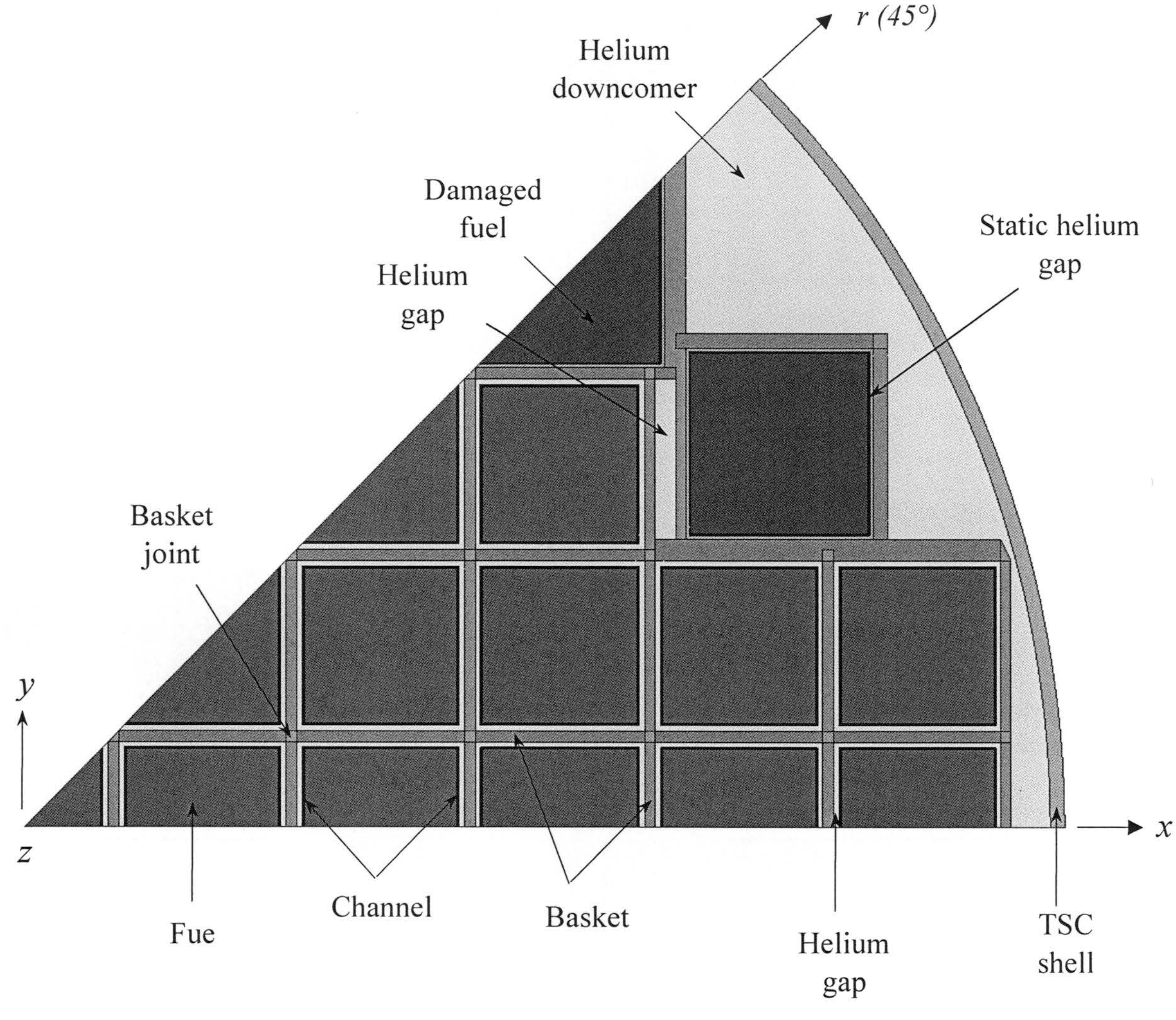


Figure 4.11-21 Three-dimensional Eighth-symmetry TSC model for BWR DF Configuration - Symmetry Plane (45°) View

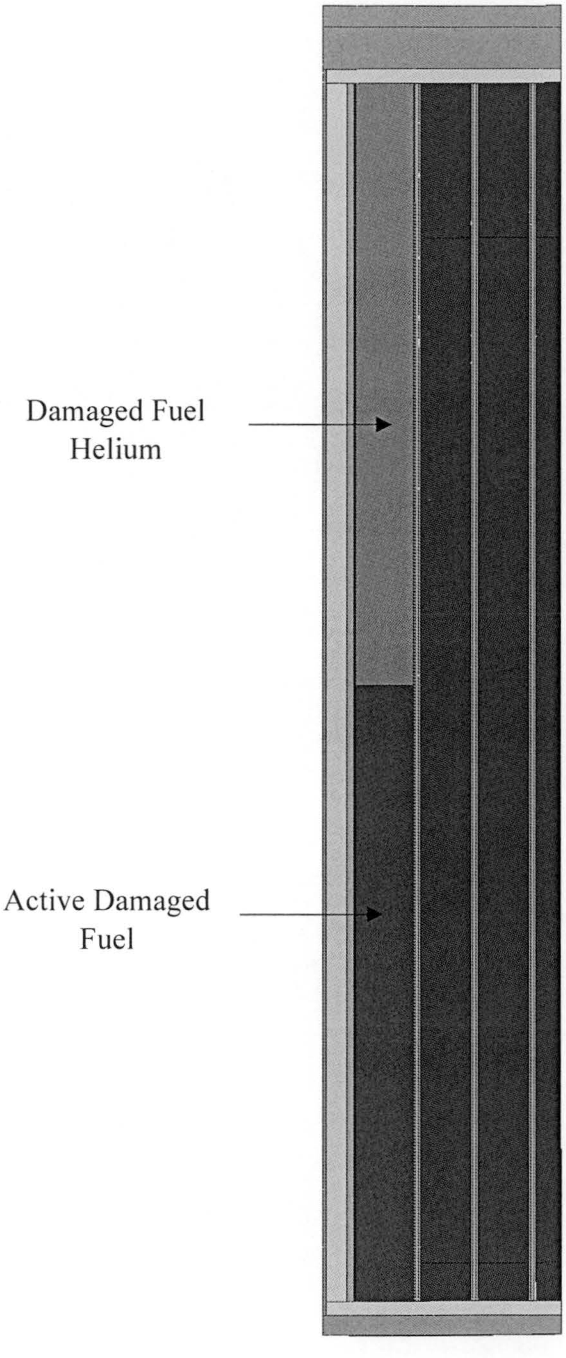
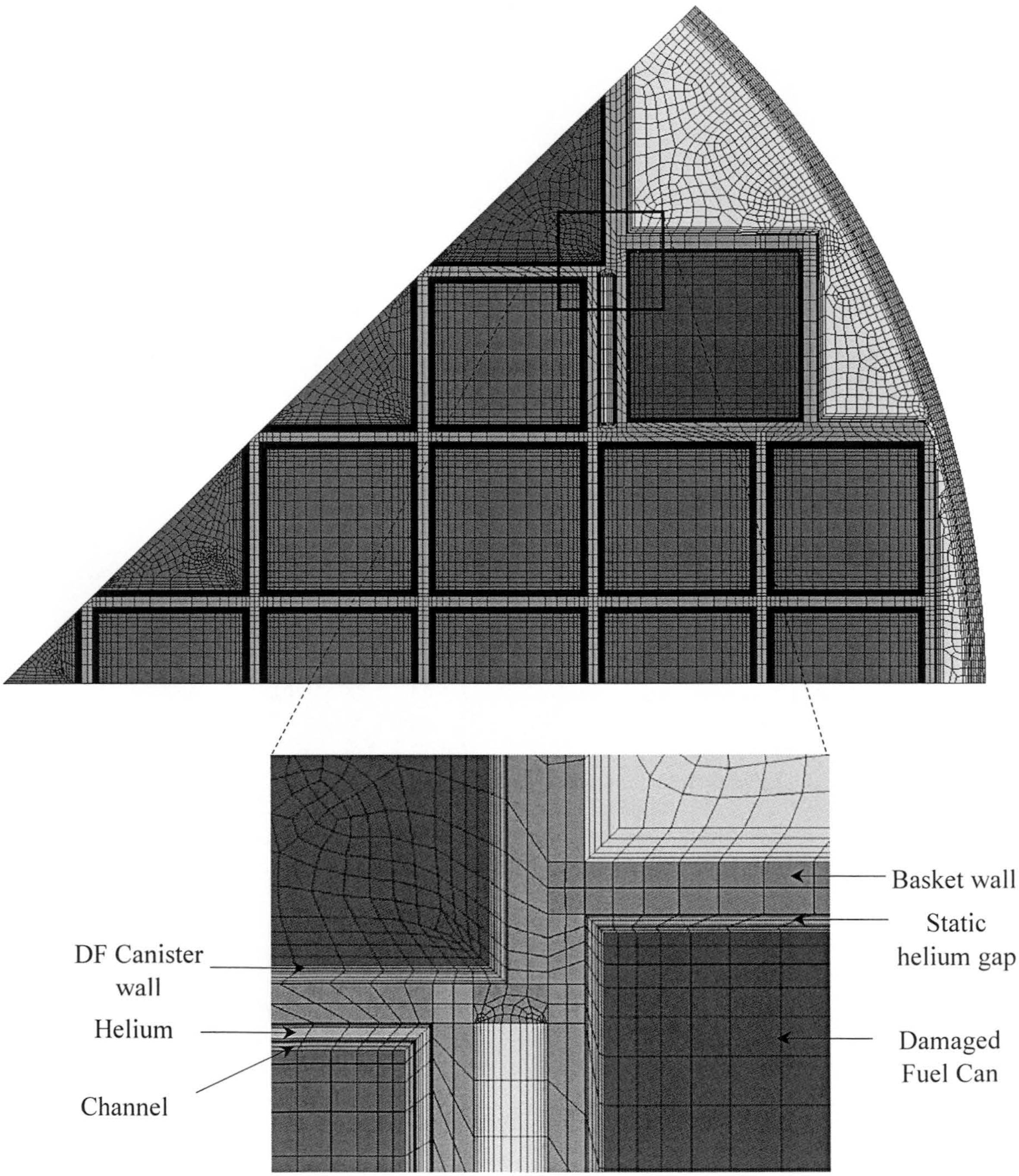


Figure 4.11-22 Mesh of Three-dimensional TSC model for BWR DF configuration - XY Plane View



Enlarged view of the

Figure 4.11-23 Three-dimensional Eighth-symmetry Concrete Cask and TSC Model for All Inlet Blocked Condition (BWR) - Symmetry Plane View

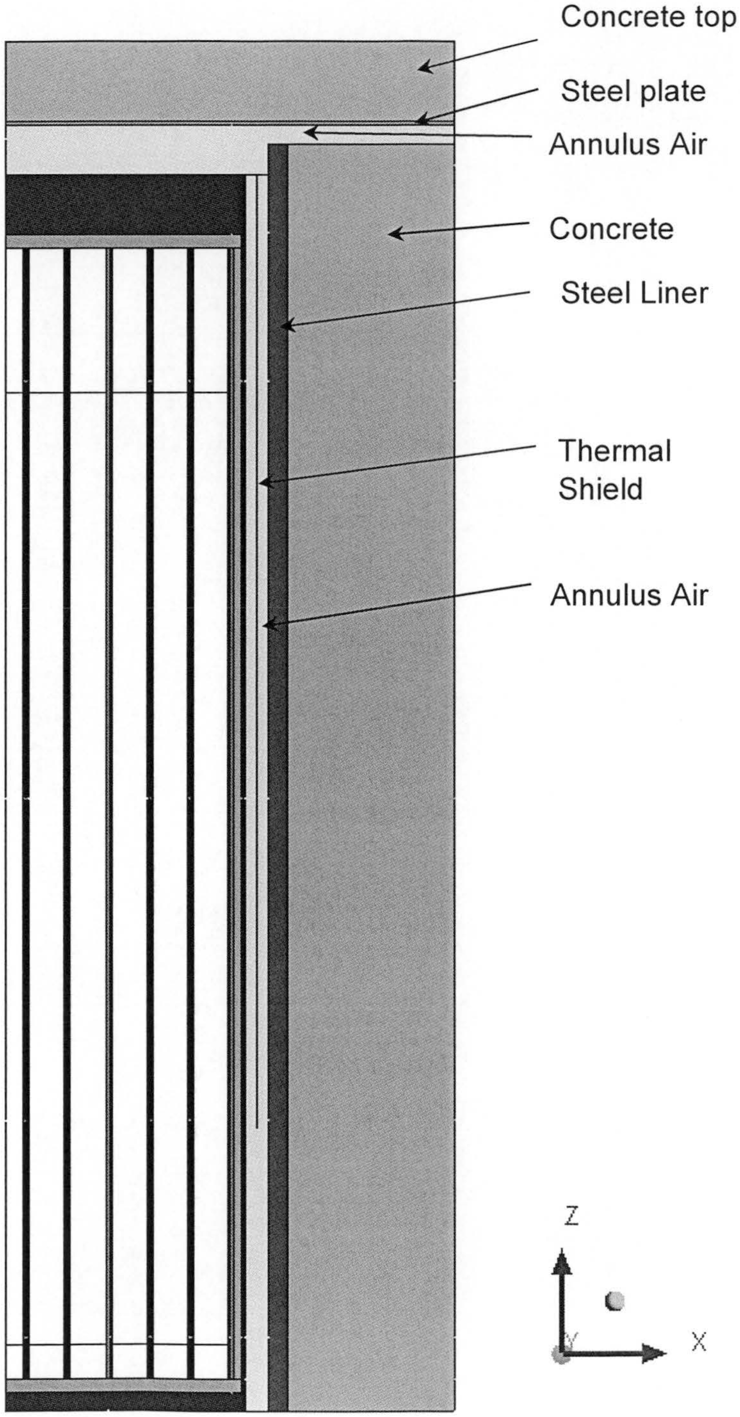


Figure 4.11-24 Three-dimensional Eighth-symmetry Transfer Cask and TSC Model (BWR) - XY Plane View

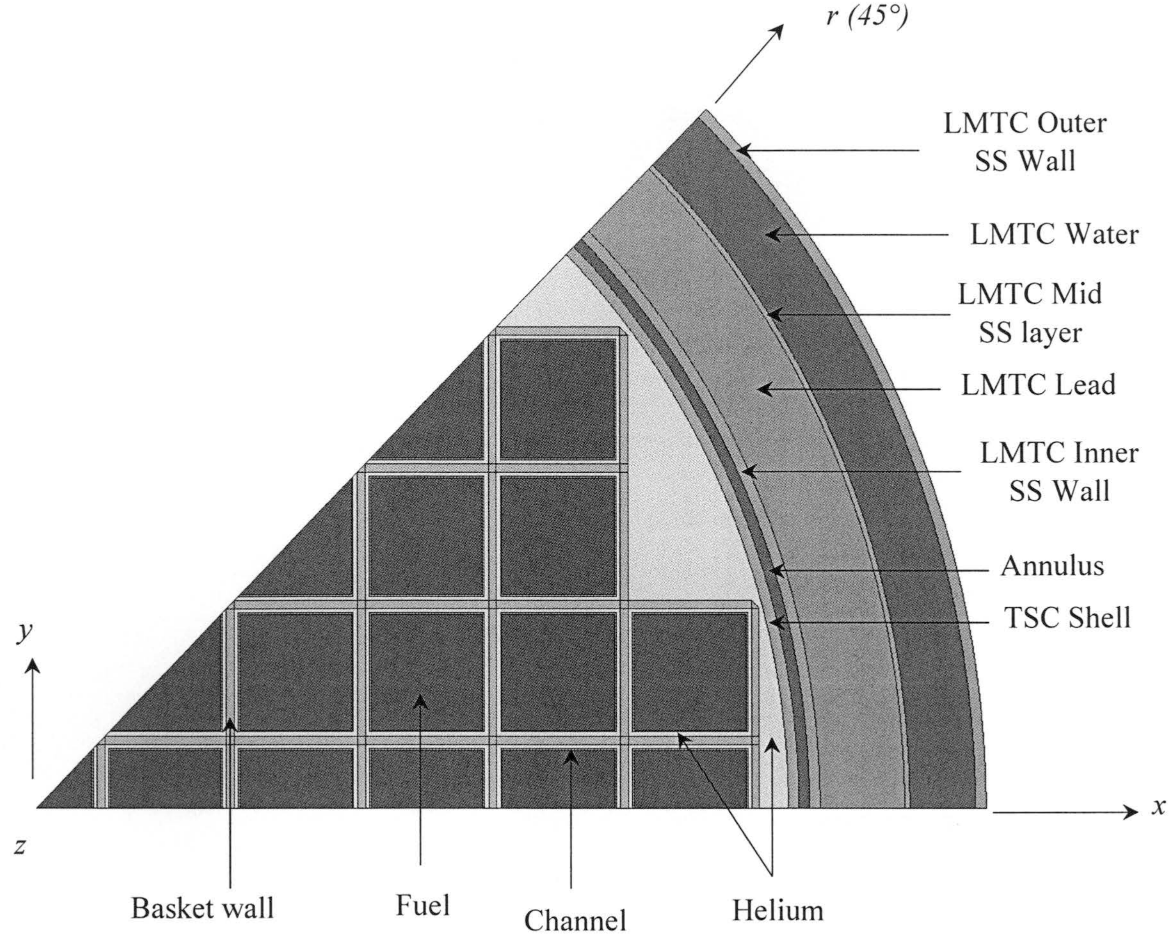


Figure 4.11-25 Three-dimensional Transfer Cask and TSC Model (BWR) - Symmetry Plane View

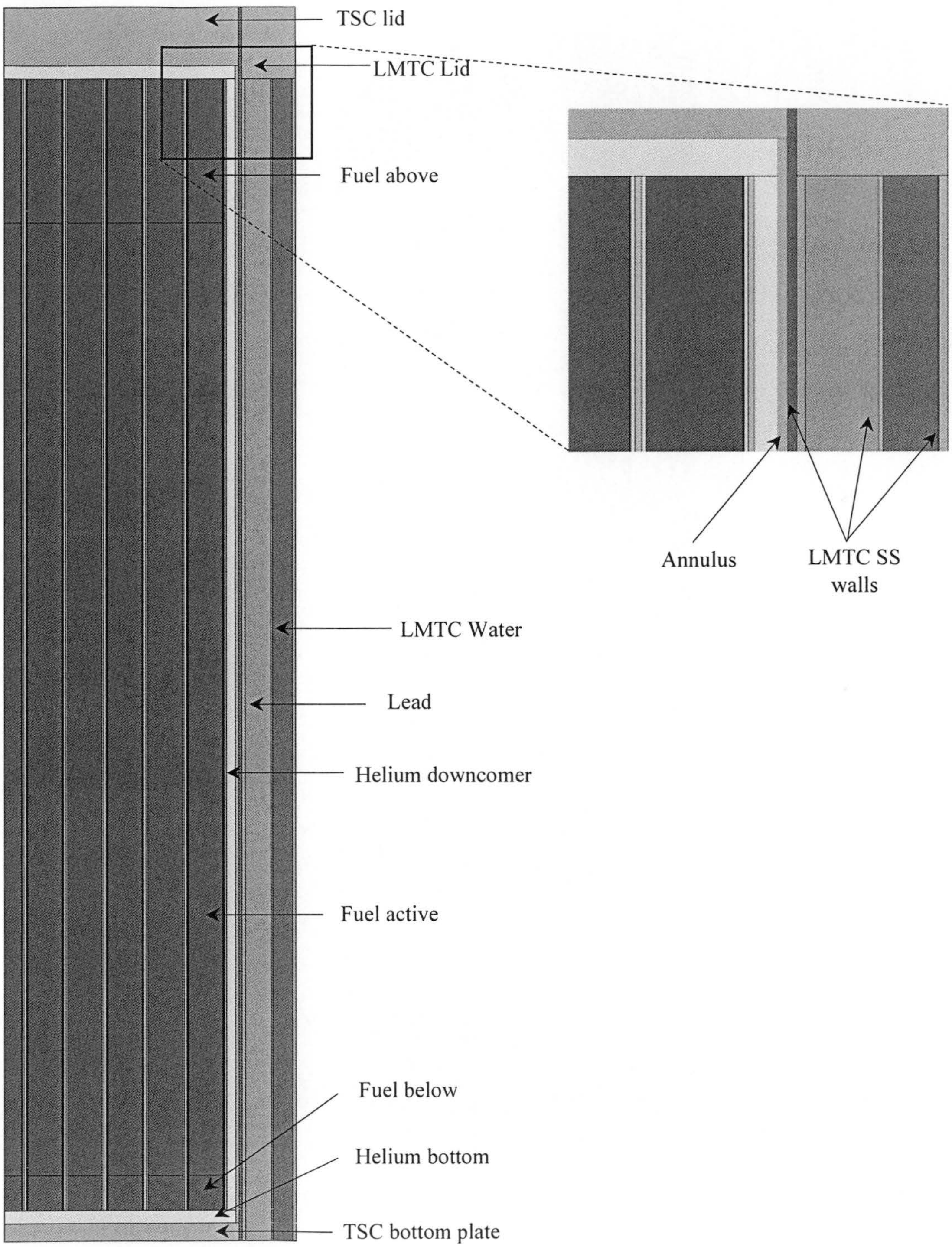
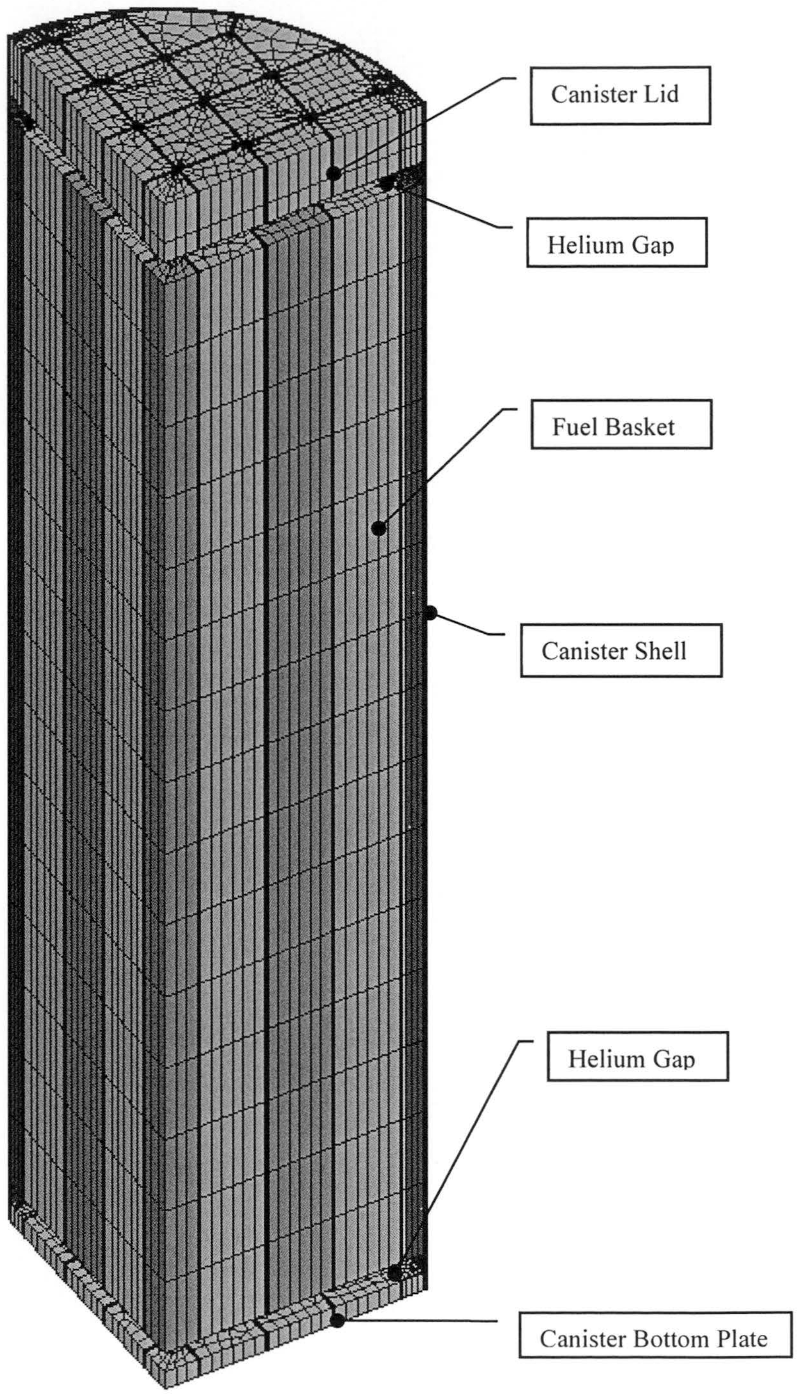
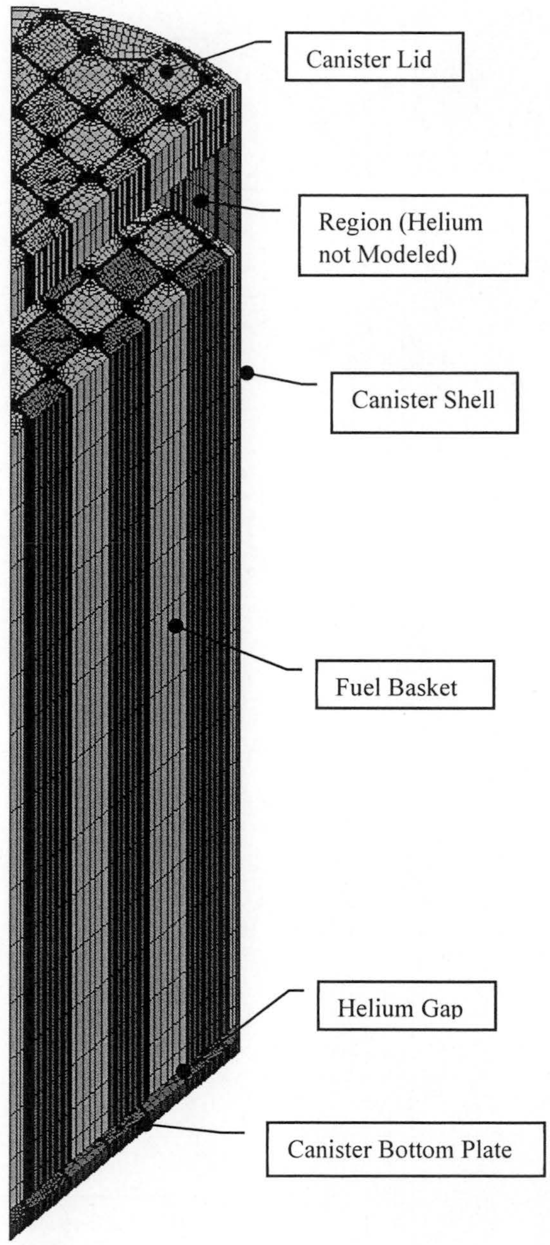


Figure 4.11-26 Three-Dimensional ANSYS Model of the PWR Canister for Vacuum Drying Condition



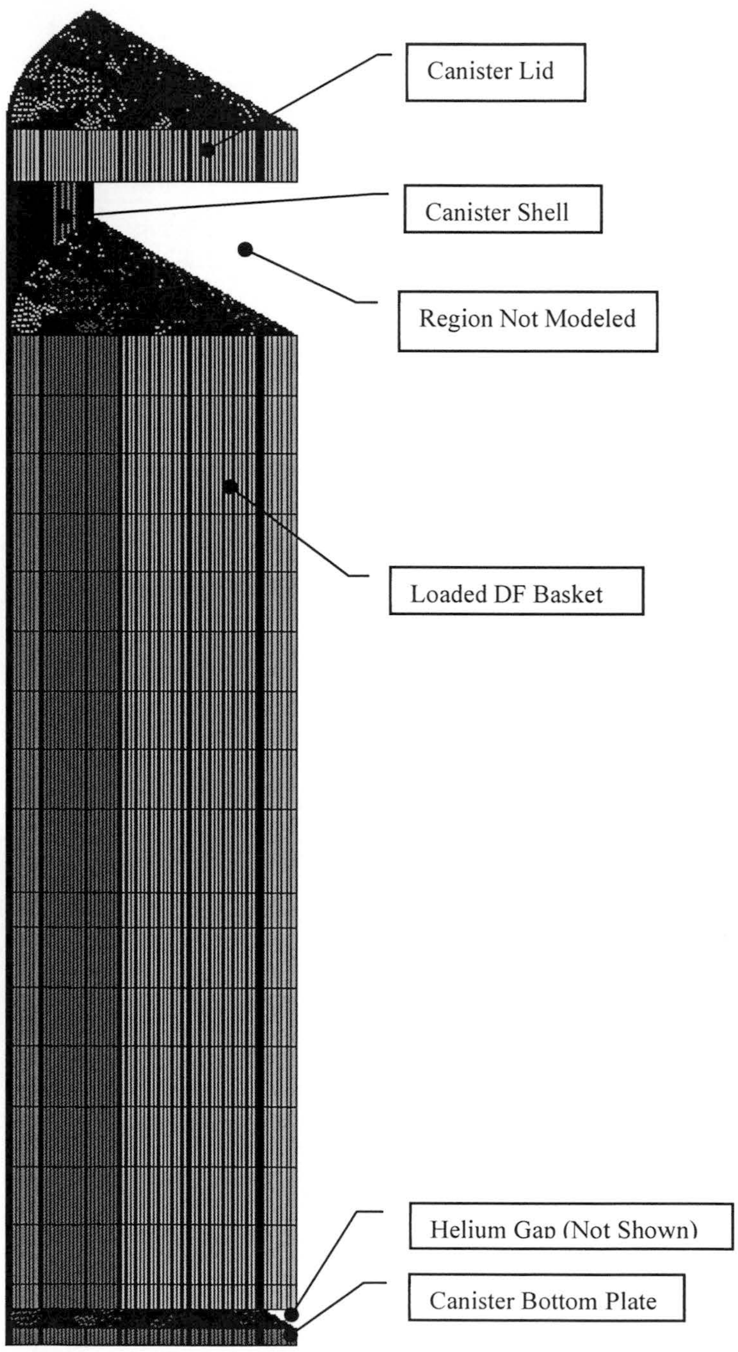
(Helium gaps on both top and bottom of the basket are not shown for clarity).

Figure 4.11-27 Three-Dimensional ANSYS Model of the BWR Canister for Vacuum Drying Analyses



(Helium gap at the bottom of the basket is not shown for clarity).

Figure 4.11-28 Three-Dimensional ANSYS Model of the BWR DF Canister for Vacuum Drying Analyses



(Helium gap on the bottom of the basket is not shown for clarity).

Figure 4.11-29 Detailed View of the Three-Dimensional ANSYS Model of the BWR DF Canister for Vacuum Drying Analyses

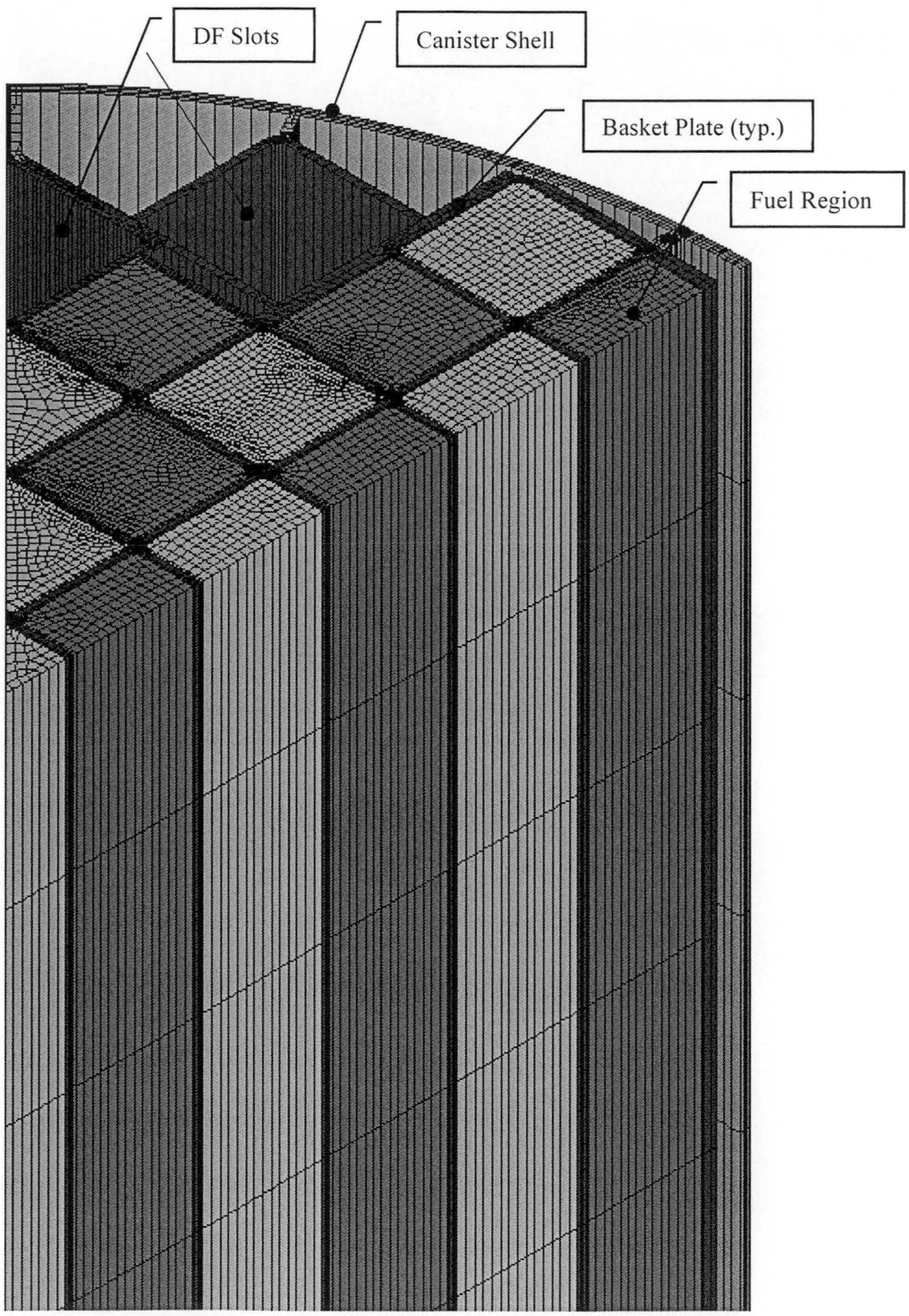
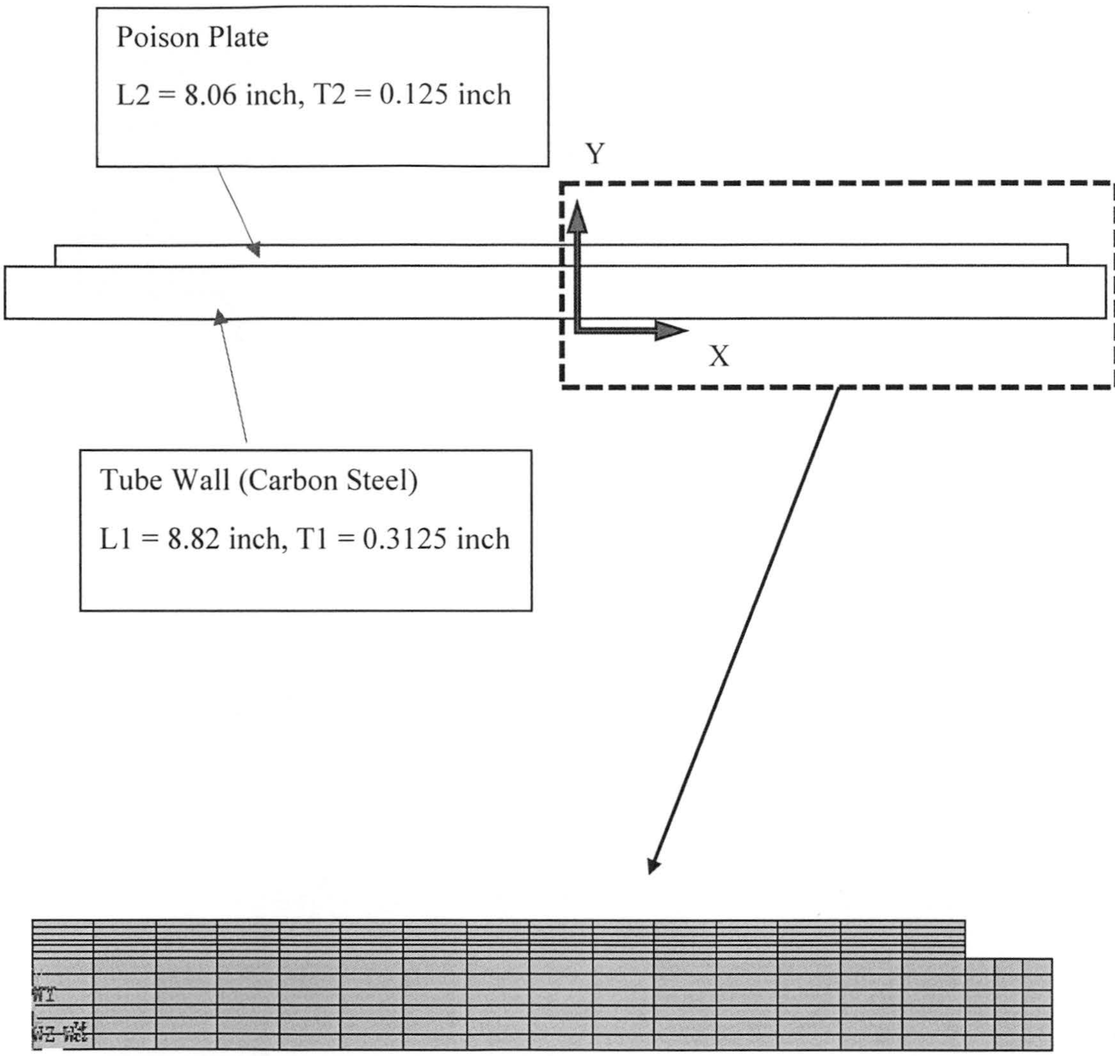


Figure 4.11-30 Two-Dimensional Fuel Tube Wall Model for PWR



(Mesh Shown for Half of the Model)

Figure 4.11-31 Two-Dimensional Fuel Tube Wall Model for BWR

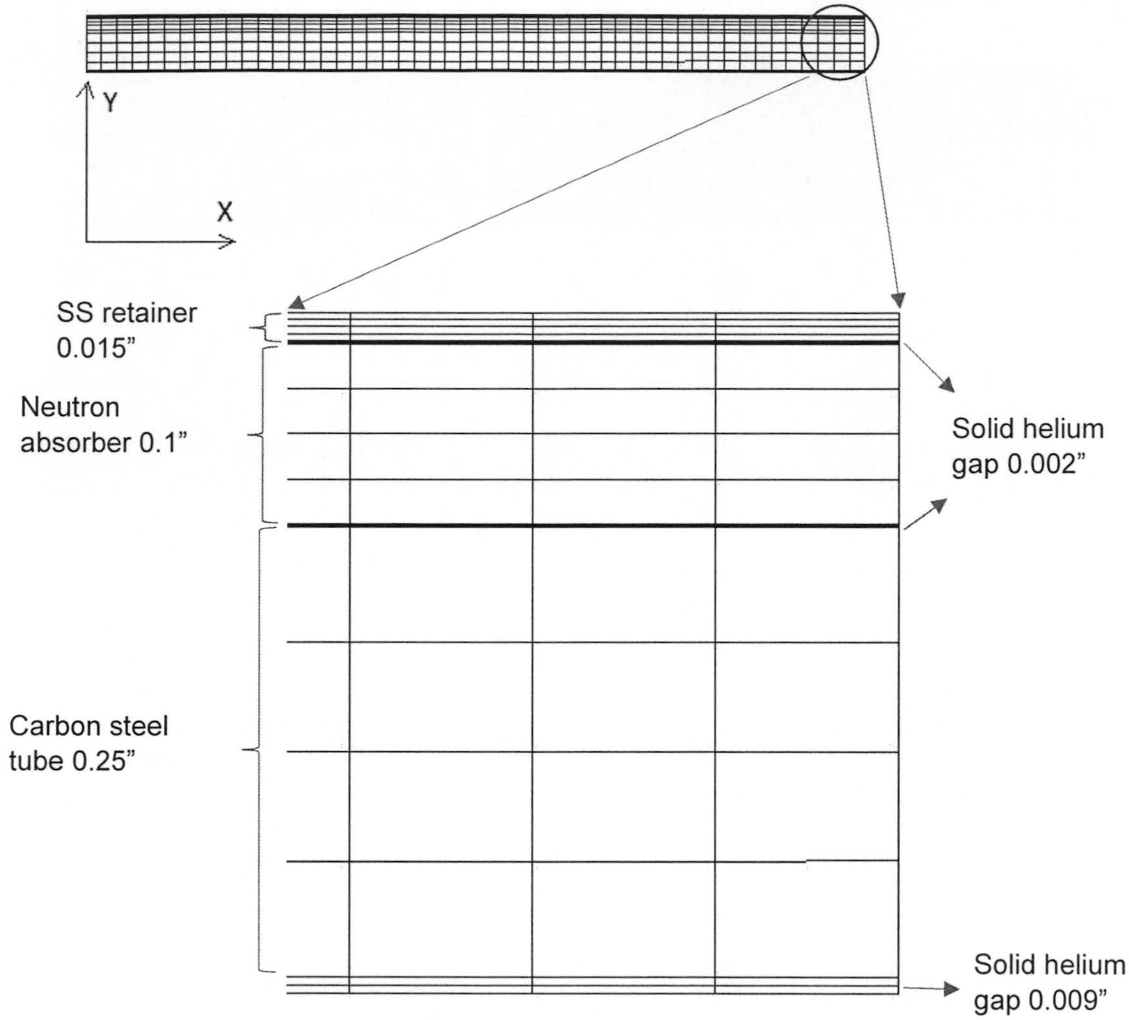


Figure 4.11-32 Two-Dimensional Fuel Tube Wall Model for BWR with Zircaloy

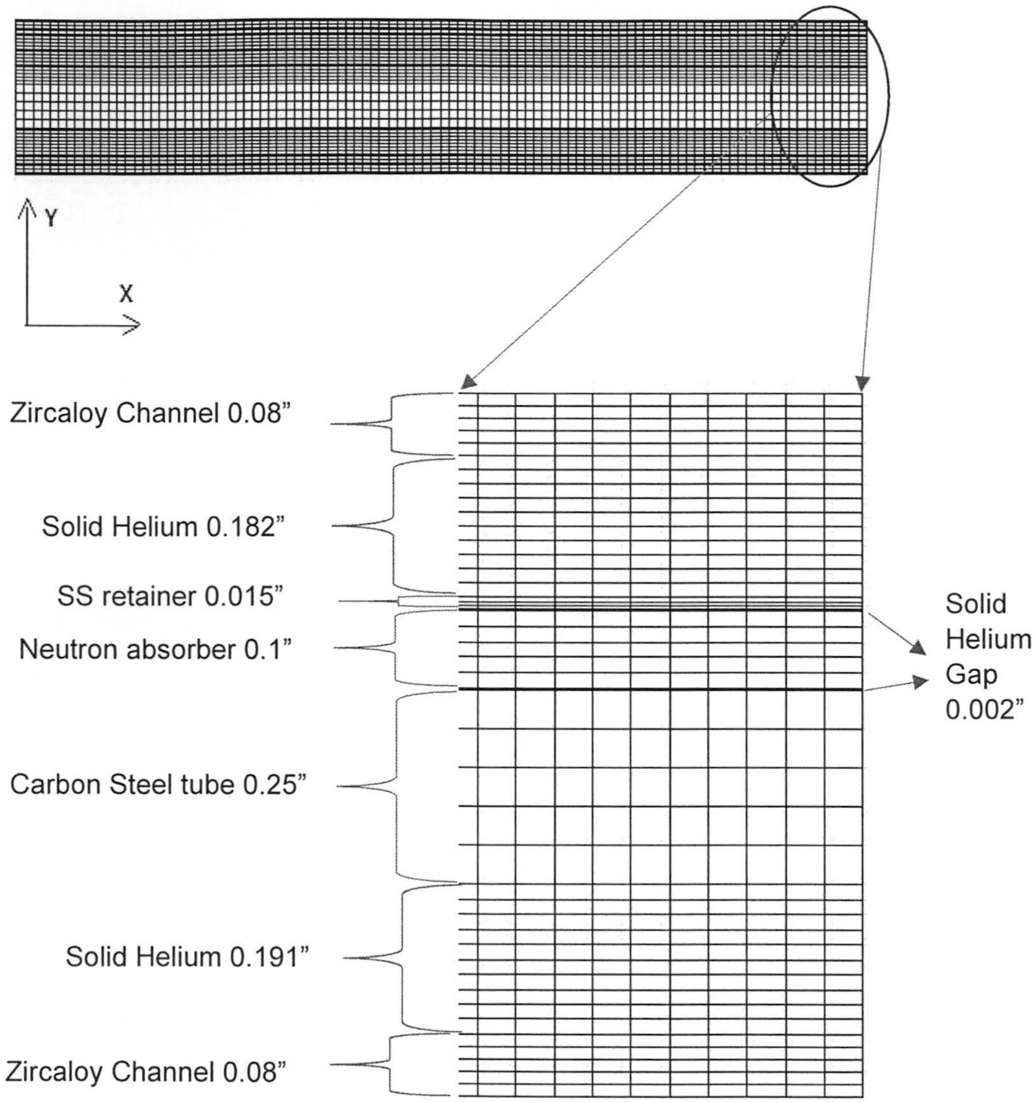
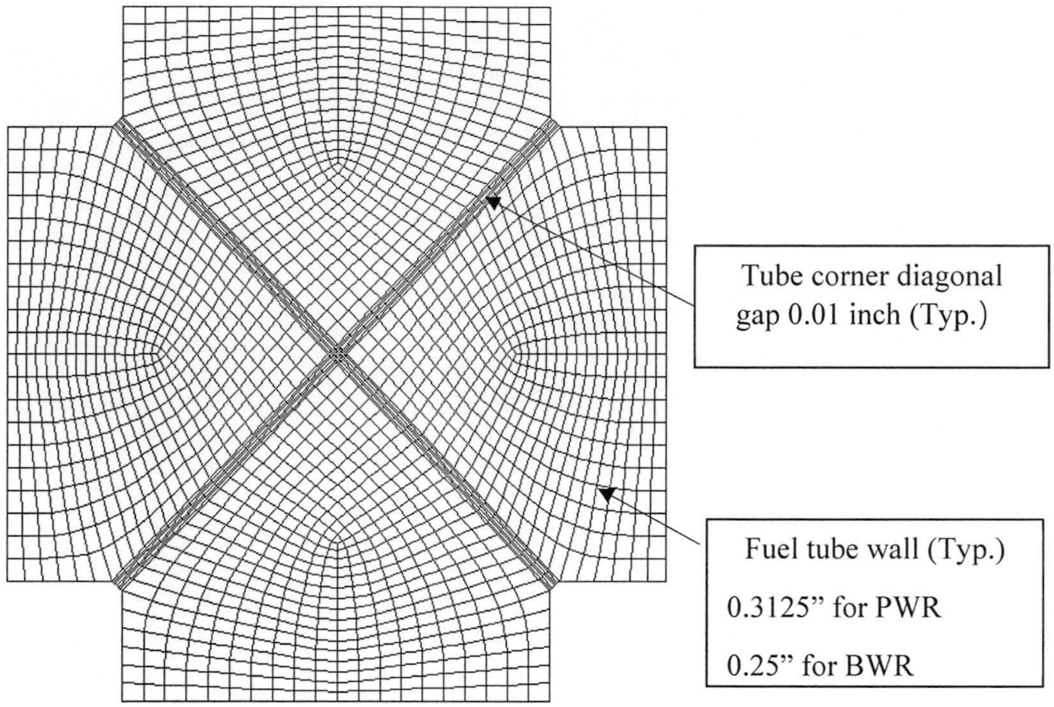


Figure 4.11-33 Two-Dimensional Fuel Tube Corner Model



4.11.2 Normal Storage Conditions

This section evaluates thermal performance of the MAGNASTOR system with high heat loading for normal condition of storage and the transfer conditions. The two-dimensional and three-dimensional concrete cask and TSC models described in Sections 4.11.1.1 and 4.11.1.2 are used for the evaluation for storage condition. The three-dimensional transfer cask and TSC FLUENT models and three-dimensional TSC ANSYS models, presented in Section 4.11.1.4 and Section 4.11.1.5, respectively, are used for the evaluation for transfer conditions.

4.11.2.1 Maximum Temperatures for Normal Conditions of Storage

The temperature distributions and maximum component temperatures for normal conditions of storage are provided in this section.

4.11.2.1.1 Maximum Temperatures for Normal Conditions for PWR

The thermal evaluations are performed for three PWR heat load patterns shown in Figures 4.11-1 through 4.11-3. The maximum fuel cladding temperatures are 745°F, 741°F, and 720°F for heat load pattern I, J, and K, respectively. Table 4.11.2.1-1 shows maximum temperatures of fuel cladding, basket, TSC and concrete for the three evaluated heat load patterns for PWR. As shown in the table, the maximum temperatures for the fuel cladding and concrete are below the allowable temperatures. The average helium temperature in the TSC for PWR Configuration is 461°F for the heat load pattern I.

4.11.2.1.2 Maximum Temperatures for Normal Conditions for BWR

The thermal evaluations are performed for three BWR heat load patterns shown in Figures 4.11-4 through 4.11-6. The maximum fuel cladding temperatures are 707°F, 708°F, and 704°F for heat load pattern A, B, and C, respectively. Table 4.11.2.1-2 shows maximum temperatures of fuel cladding, basket, TSC and concrete for the three evaluated heat load patterns for BWR. As shown in the table, the maximum temperatures for the fuel cladding and concrete are below the allowable temperatures. The average helium temperature in the TSC for BWR Configuration is 461°F for the heat load pattern B.

4.11.2.1.3 Maximum Temperatures for Normal Conditions for BWR DF

The thermal evaluations are performed for three BWR DF heat load patterns shown in Figures 4.11-7 through 4.11-9. The maximum fuel cladding temperatures are 719°F, 696°F, and 694°F for DF heat load pattern A, B, and C, respectively. Table 4.11.2.1-3 shows maximum temperatures of fuel cladding, basket, TSC and concrete for the three evaluated heat load patterns for BWR DF. As shown in the table, the maximum temperatures for the fuel cladding and concrete are below the

allowable temperatures. The average helium temperature in the TSC for BWR DF Configuration is 460°F for the heat load pattern B.

Table 4.11.2.1-1 Maximum Component Temperatures for Normal Condition of Storage for High Heat Loading of MAGNASTOR System for PWR

		Maximum Temperatures (°F)			Allowable Temperature (°F)
		I*	J*	K*	
Fuel Cladding		745	741	720	752
Fuel Basket		730	682	688	800
TSC Shell		468	464	465	800
Concrete	local	195	192	193	300
	bulk	182	179	180	200

* Heat load patterns defined in Figures 4.11-1 through 4.11-3.

Table 4.11.2.1-2 Maximum Component Temperatures for Normal Condition of Storage for High Heat Loading of MAGNASTOR System for BWR

		Maximum Temperatures (°F)			Allowable Temperature (°F)
		A*	B*	C*	
Fuel Cladding		707	708	704	752
Fuel Basket		698	684	683	800
TSC Shell		433	448	448	800
Concrete	local	183	191	189	300
	bulk	173	179	176	200

* Heat load patterns defined in Figures 4.11-4 through 4.11-6.

Table 4.11.2.1-3 Maximum Component Temperatures for Normal Condition of Storage for High Heat Loading of MAGNASTOR System for BWR DF

		Maximum Temperatures (°F)			Allowable Temperature (°F)
		A*	B*	C*	
Fuel Cladding		719	696	694	752
Fuel Basket		707	690	687	800
TSC Shell		433	448	448	800
Concrete	local	183	191	189	300
	bulk	173	179	176	200

* Heat load patterns defined in Figures 4.11-7 through 4.11-9.

4.11.2.2 Maximum Temperatures for Transfer Conditions

The maximum component temperatures during the transfer operations are reported in this Section. The transfer operation is comprised of four phases: water phase, vacuum drying phase, cooling/helium phase and transfer phase. The ACWS is in operation for all phases except the transfer phase.

4.11.2.2.1 Maximum Temperatures for Transfer Conditions for PWR

The maximum fuel temperatures for the water phase and helium phase for steady state condition are listed in Table 4.11.2.2-1 and Table 4.11.2.2-2, respectively, calculated using the three-dimensional transfer cask and TSC FLUENT models described in Section 4.11.1.4.1.

The maximum temperatures of fuel and basket at the end of vacuum drying for three heat load patterns are shown in Table 4.11.2.2-3, based on the analyses using the three-dimensional TSC ANSYS model described in Section 4.11.1.5.1. The maximum fuel temperature at the end of vacuum drying is 681°F (heat load pattern K). For the cooling phase, the TSC is backfilled with helium. Two transient analyses (for heat loading patterns I and K) are performed using the three-dimensional transfer cask and TSC FLUENT model. Loading pattern J is bounded by loading pattern K. For both heat loading patterns (I and K), a conservative temperature profile that bounds the temperature profiles at the end of the vacuum drying phase is used as the initial condition of the transient analysis for the cooldown phase.

The maximum fuel temperatures are 433°F and 474°F at the end of the 24-hour cooldown, for heat loading patterns I and K, respectively, as shown in Table 4.11.2.2-4. Based on maximum fuel temperatures after vacuum drying and the 24-hour cooldown, the allowable time for second vacuum drying is determined as 9, 15, and 19 hours for heat loading patterns I, J, and K, respectively, as shown in Table 4.11.2.2-5. The bounding maximum average helium temperature during the 24-hour cooling is 460°F.

After the vacuum drying is complete and the system is cooled for 12 hours, the TSC is transferred to the concrete cask with an administrative time limit of 16 hours. Transient analyses are performed using the three-dimensional transfer cask and TSC FLUENT models for heat loading pattern I and K. Loading pattern J is bounded by loading pattern K. As shown in Table 4.11.2.2-6, the maximum fuel temperature is calculated to be 630°F (heat loading pattern I) and 653°F (heat loading pattern K) at the end of the transfer condition. The bounding maximum average helium temperature during the 16-hour transfer is 424°F.

4.11.2.2.2 Maximum Temperatures for Transfer Conditions for BWR

The maximum fuel temperatures for the water phase and helium phase for steady state condition are listed in Table 4.11.2.2-7 and Table 4.11.2.2-8, respectively, calculated using the three-dimensional transfer cask and TSC FLUENT models described in Section 4.11.1.4.2.

The maximum temperatures of fuel and basket at the end of vacuum drying for three heat load patterns are shown in Table 4.11.2.2-9, based on the analyses using the three-dimensional TSC ANSYS model described in Section 4.11.1.5.2. The maximum fuel temperature at the end of vacuum drying is 659°F for heat load pattern B. For the cooling phase, the TSC is backfilled with helium. Two transient analyses (for heat loading patterns A and B) are performed using the three-dimensional transfer cask and TSC FLUENT models. For heat loading pattern A, a conservative temperature profile (with a maximum fuel temperature of 694°F) that bounds the temperature state at the end of the vacuum drying phase (maximum temperature is 647°F) is used as the initial condition of the transient analysis for the cooldown phase. For heat loading pattern B that bounds the heat loading pattern C, a conservative temperature profile (with a maximum fuel temperature of 697°F) that bounds the temperature state at the end of the vacuum drying phase (maximum temperature is 659°F for pattern B and is 656°F for pattern C) is used as the initial condition of the transient analysis for the cooldown phase.

The maximum fuel temperatures are 422°F and 452°F at the end of the 24-hour cooldown, for heat loading patterns A and B, respectively, as shown in Table 4.11.2.2-10. Based on maximum fuel temperature after vacuum drying and the 24-hour cooldown, the allowable time for second vacuum drying is determined as 14, 25, and 25 hours for heat loading patterns A, B, and C, respectively, as shown in Table 4.11.2.2-11. The bounding maximum average helium temperature during the 24-hour cooling is 453°F.

After the vacuum drying is complete and the system is cooled for 12 hours, the TSC is transferred to the concrete cask with an administrative time limit of 22 hours. Transient analyses are performed using the three-dimensional transfer cask and TSC FLUENT models for heat loading pattern A and B with air flow in the annulus. As shown in Table 4.11.2.2-12, the maximum fuel temperatures are calculated to be 654°F for heat loading pattern A and 677°F for heat loading patterns B and C at the end of the transfer condition. The bounding maximum average helium temperature during the 22-hour transfer is 462°F.

4.11.2.2.3 Maximum Temperatures for Transfer Conditions for BWR DF

The maximum fuel temperatures for the water phase and helium phase for steady state condition are listed in Table 4.11.2.2-13 and Table 4.11.2.2-14, respectively, calculated using the three-dimensional transfer cask and TSC FLUENT models described in Section 4.11.1.4.2.

The maximum temperatures of fuel and basket at the end of vacuum drying for three heat load patterns are shown in Table 4.11.2.2-15, based on the analyses using the three-dimensional TSC ANSYS model described in Section 4.11.1.5.3. Thermal analysis results of 24 hour helium cooling and the transfer for intact fuel configuration are used for the DF configuration during 24 hour helium cooling and the transfer, respectively, since the heat loads for intact fuel configuration are equal to (39.5kW for pattern A) or higher (42.0kW for intact fuel patterns B and C, 41.0kW for DF patterns B and C). Also, higher average fuel temperatures in the initial condition of the helium cooling for intact fuel configuration show more energy stored in the system. The maximum fuel temperature at the end of vacuum drying is 660°F for heat load pattern B. For the cooling phase, the TSC is backfilled with helium. The analysis results of two transient analyses (for heat loading patters A and B for intact fuel configuration) are utilized for the high heat BWR DF. For heat loading pattern A, a conservative temperature profile for intact fuel configuration (with a maximum fuel temperature of 694°F) that bounds the temperature state at the end of the vacuum drying phase (maximum temperature is 645°F, Table 4.11.2.2-15) is used as the initial condition of the transient analysis for the cooldown phase. For heat loading pattern B which bounds the heat loading pattern C, a conservative temperature profile for intact fuel configuration (with a maximum fuel temperature of 697°F) that bounds the temperature state at the end of the vacuum drying phase (maximum temperature is 660°F for pattern B and is 654°F for pattern C, Table 4.11.2.2-15) is used as the initial condition of the transient analysis for the cooldown phase.

The maximum fuel temperatures are 422°F and 452°F at the end of the 24-hour cooldown, for heat loading patterns A and B, respectively, as shown in Table 4.11.2.2-16. Based on maximum fuel temperature after the first vacuum drying and the 24-hour cooldown, the allowable time for second vacuum drying is determined as 13 hours, 20 hours, and 19 hours for heat loading patterns A, B, and C, respectively, as shown in Table 4.11.2.2-17. The bounding maximum average helium temperature during the 24-hour helium cooling is 453°F.

After the vacuum drying is complete and the system is cooled for 12 hours, the TSC is transferred to the concrete cask within an administrative time limit of 22 hours. As shown in Table 4.11.2.2-18, the maximum fuel temperatures are calculated to be 654°F for heat loading pattern A and 677°F for heat loading patterns B and C at the end of the transfer condition. The bounding maximum average helium temperature during the 22-hour transfer is 462°F.

Table 4.11.2.2-1 Maximum Fuel Temperature for Steady State Water Phase - PWR

[redacted]

Table 4.11.2.2-2 Maximum Fuel Temperature for Steady State Helium Phase - PWR

[redacted]

Table 4.11.2.2-3 Durations and the Temperature at the End of the Duration for the First Vacuum Stage - PWR

[redacted]

Table 4.11.2.2-4 Maximum Temperature at the End of the 24 Hour Helium Cooling - PWR

[redacted]

Table 4.11.2.2-5 Durations and the Temperature at the End of the Duration for the Second Vacuum Stage - PWR

[redacted]

Table 4.11.2.2-6 Durations Allowed and the Temperature at the End of the Duration for the Canister Transfer to Concrete Cask after 12-Hour Helium Cooling - PWR

[redacted]

Table 4.11.2.2-7 Maximum Fuel Temperature for Steady State Water Phase - BWR

[redacted]

Table 4.11.2.2-8 Maximum Fuel Temperature for Steady State Helium Phase - BWR

[redacted]

Table 4.11.2.2-9 Durations and the Temperature at the End of the Duration for the First Vacuum Stage - BWR

[redacted]

Table 4.11.2.2-10 Maximum Temperature at the End of the 24-Hour Helium Cooling - BWR

[redacted]

Table 4.11.2.2-11 Durations and the Temperature at the End of the Duration for the Second Vacuum Stage - BWR

[redacted]

Table 4.11.2.2-12 Durations Allowed and the Temperature at the End of the Duration for the Canister Transfer to Concrete Cask after 12-Hour Helium Cooling - BWR

[redacted]

Table 4.11.2.2-13 Maximum Fuel Temperature for Steady State Water Phase - BWR DF

[redacted]

Table 4.11.2.2-14 Maximum Fuel Temperature for Steady State Helium Phase - BWR DF

[redacted]

Table 4.11.2.2-15 Durations and the Temperature at the End of the Duration for the First Vacuum Stage - BWR DF

[redacted]

Table 4.11.2.2-16 Maximum Temperature at the End of the 24 Hour Helium Cooling - BWR DF

[redacted]

Table 4.11.2.2-17 Durations and the Temperature at the End of the Duration for the Second Vacuum Stage - BWR DF

[redacted]

Table 4.11.2.2-18 Durations Allowed and the Temperature at the End of the Duration for the Canister Transfer to Concrete Cask after 12-Hour Helium Cooling - BWR DF

[redacted]

4.11.2.3 Maximum Internal Pressure

[redacted]

4.11.3 Off-Normal Events

4.11.3.1 Off-Normal Storage Events

This section evaluates postulated off-normal storage events for MAGNASTOR systems with high heat loading. The off-normal storage events include severe ambient temperature (106°F and -40°F) and half inlets blocked conditions. The evaluation of the off-normal events for variations in the ambient temperature only requires a change to the boundary condition temperature. For the half-blocked air inlets condition, the air inlet condition is modified to permit air flow through half of the inlet area.

For high heat PWR Configuration, the heat load pattern I is used for these analyses since it is the bounding case (see Table 4.11.2.1-1). The temperatures of different components for off-normal storage conditions are shown below.

Component	106°F Ambient, Maximum Temperatures (°F)	-40°F Ambient, Maximum Temperatures (°F)	76°F Ambient/Half Blocked Air Inlets Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	775	620	752	1,058
Fuel Basket	761	620*	752*	1,000
TSC Shell	495	352	473	800
Concrete	236	30	202	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

For BWR Configuration, the heat load pattern B is used for these analyses since it is the bounding case (see Table 4.11.2.1-2). The temperatures of different components for off-normal storage conditions are shown below.

Component	106°F Ambient, Maximum Temperatures (°F)	-40°F Ambient, Maximum Temperatures (°F)	76°F Ambient/Half Blocked Air Inlets Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	753	604	731	1,058
Fuel Basket	732	604*	731*	1,000
TSC Shell	494	338	469	800
Concrete	239	26	201	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

The maximum average helium temperature for BWR is 504 °F for all off-normal conditions.

For BWR DF Configuration, the heat load pattern A is used for these analyses since it is the bounding case (see Table 4.11.2.1-3). The temperatures of different components for off-normal storage conditions are shown below.

Component	106°F Ambient, Maximum Temperatures (°F)	-40°F Ambient, Maximum Temperatures (°F)	76°F Ambient/Half Blocked Air Inlets Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	785	618	742	1,058
Fuel Basket	772	618*	742*	1,000
TSC Shell	494	339	470	800
Concrete	239	26	201	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

The maximum average helium temperature for BWR DF is 505 °F for all off-normal conditions.

Internal Pressure for Off-Normal Events

Maximum TSC internal pressure for the off-normal events is calculated using the evaluation method, including rod failure fractions, as documented in Section 4.5.2 and a bounding average helium temperature of 521°F. The calculated maximum TSC internal pressures are 119 psig for the PWR and PWR DF configurations and 112 psig for the BWR and BWR DF configurations.

4.11.4 Accident Events

This section presents the evaluations of the thermal accident design events, which address very low probability events that might occur once during the lifetime of the ISFSI or hypothetical events that are postulated because their consequences may result in the maximum potential impact on the surrounding environment. Three thermal accident events are evaluated in this section: maximum anticipated temperature, fire accident and full blockage of the air inlets.

4.11.4.1 Maximum Anticipated Temperatures

This section evaluates the concrete cask and the TSC for the postulated event of an ambient temperature of 133°F. A steady state condition is considered in the thermal evaluation of the system for this accident event. The two-dimensional and three-dimensional concrete cask and TSC models described in Sections 4.11.1.1 and 4.11.1.2 is used for this evaluation.

For high heat PWR, the analysis is performed using the bounding heat load pattern I as shown in Figure 4.11-1. The maximum temperatures of the different components of the system are shown in the following table. The average helium temperature in the TSC is 515°F.

Component	Maximum Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	803	1,058
Fuel Basket	803*	1,000
TSC Shell	522	800
Concrete	272	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

For high heat BWR, the analysis is performed using the bounding heat load pattern B as shown in Figure 4.11-5. The maximum temperatures of the different components of the system are shown in the following table. The average helium temperature in the TSC is 527°F.

Component	Maximum Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	774	1,058
Fuel Basket	774*	1,000
TSC Shell	515	800
Concrete	275	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

For high heat BWR DF, the analysis is performed using the bounding heat load pattern A as shown in Figure 4.11-7. The maximum temperatures of the different components of the system are shown in the following table. The average helium temperature in the TSC is 527°F.

Component	Maximum Temperatures (°F)	Allowable Temperature (°F)
Fuel Cladding	805	1,058
Fuel Basket	805*	1,000
TSC Shell	515	800
Concrete	275	350

*Maximum fuel temperature is conservatively used for maximum basket temperature.

4.11.4.2 Fire Accident

The evaluation of the hypothetic fire accident for MAGNASTOR system is described in Section 4.6.2. Based on the transient analysis presented in Section 4.6.2 for the concrete cask for the PWR system with the design basis heat load of 35.5 kW, there is an insignificant effect of the 8-minute fire on the maximum fuel temperature (3°F increase). Since the MAGNASTOR system with high heat loading is similar to the MAGNASTOR PWR system evaluated in Section 4.6.2, the maximum fuel temperatures for the high heat system are determined by adding 3°F to the maximum fuel temperatures for normal condition of storage as documented in Table 4.11.2.1-1, Table 4.11.2.1-2 and Table 4.11.2.1-3 for PWR, BWR and BWR DF configurations respectively. The resulting maximum fuel temperatures for fire accident are calculated to be 748°F, 711°F and 722°F for PWR, BWR and BWR DF configurations, respectively, which remain well below the allowable temperature of 1058°F for accident condition. Based on the transient analysis in Section 4.6.2, the limited duration of the fire, the large thermal capacitance of the concrete cask, and the minimal thermal conductivity limit the local region where the concrete temperatures exceed 300°F to less than 10 inches above the top surface of the air inlets. These results confirm that the operation of the concrete cask is not adversely affected during and after the fire accident condition.

4.11.4.3 Full Blockage of Concrete Cask Air Inlets

This section evaluates the concrete cask for the transient condition of full blockage of all the air inlets at the normal storage condition temperature (76°F). Two transient analyses are performed for this condition, one for high heat PWR and one for high heat BWR and BWR DF.

The three-dimensional concrete cask and TSC model described in Section 4.11.1.3.1 is used for the evaluation for this hypothetical accident for high heat PWR. The transient analysis uses the same methodology presented in Section 4.6.3. A bounding case with bounding initial temperatures

(loading pattern I) is used for the analysis. The maximum fuel temperature and bulk concrete temperature remain within the allowable accident temperature limits (1058°F for fuel and 350°F for concrete) for 60 hours after the initiation of the event. At 60 hours, the maximum fuel temperature, bulk concrete temperature and average helium temperature in TSC are 992°F, 253°F and 726°F, respectively. The evaluation demonstrates that there are no adverse consequences due to this accident, provided that debris is cleared from at least two air inlets within 60 hours based on the steady-state evaluation of the half-blocked air inlet condition in Section 4.11.3.

The three-dimensional concrete cask and TSC models described in Sections 4.11.1.3.2 and 4.11.1.3.3 are used for the evaluation for this hypothetical accident for high heat BWR and BWR DF, respectively. The transient analysis uses the same methodology presented in Section 4.6.3. A bounding case with bounding initial temperatures (loading pattern B for BWR and loading pattern A for BWR DF) is used for the analysis. The maximum fuel temperature and bulk concrete temperature remain within the allowable accident temperature limits (1058°F for fuel and 350°F for concrete) for 60 hours after the initiation of the event. At 60 hours, the maximum fuel temperature, bulk concrete temperature and average helium temperature in TSC are 937°F, 249°F and 724°F respectively for BWR and 950°F, 237°F and 697°F respectively for BWR DF. The evaluation demonstrates that there are no adverse consequences due to this accident, provided that debris is cleared from at least two air inlets within 60 hours based on the steady-state evaluation of the half-blocked air inlet condition in Section 4.11.3.

4.11.4.4 Maximum TSC Internal Pressure for Accident Events

Maximum TSC internal pressure for the accident events is calculated using the evaluation method, including rod failure fractions, as documented in Section 4.6.4 and a bounding average helium temperature of 737°F. The calculated maximum TSC internal pressures are 226 psig for the PWR and PWR DF configurations and 161 psig for the BWR and BWR DF configurations.

4.11.5 Surveillance Requirement

To confirm that the concrete cask heat removal system is operable, one of the following two surveillance options with a frequency of 24 hours is required: (1) Visually verify all concrete cask air inlet and outlet screens are free of blockage; (2) Verify the difference between the concrete cask air outlet average temperature and the ambient temperature is less than 134°F for the high heat PWR configurations and 151°F for the high heat BWR configurations. A minimum of two outlet air temperatures must be measured to provide an average outlet temperature to comply with Technical Specifications SURVEILLANCE REQUIREMENT 3.1.2.1. The allowable temperature difference is determined based on the maximum calculated temperature difference between air outlet and ambient from the steady state analyses for storage conditions and the calculated minimum temperature margin for the fuel for normal and off-normal conditions.