

ATTACHMENT 11

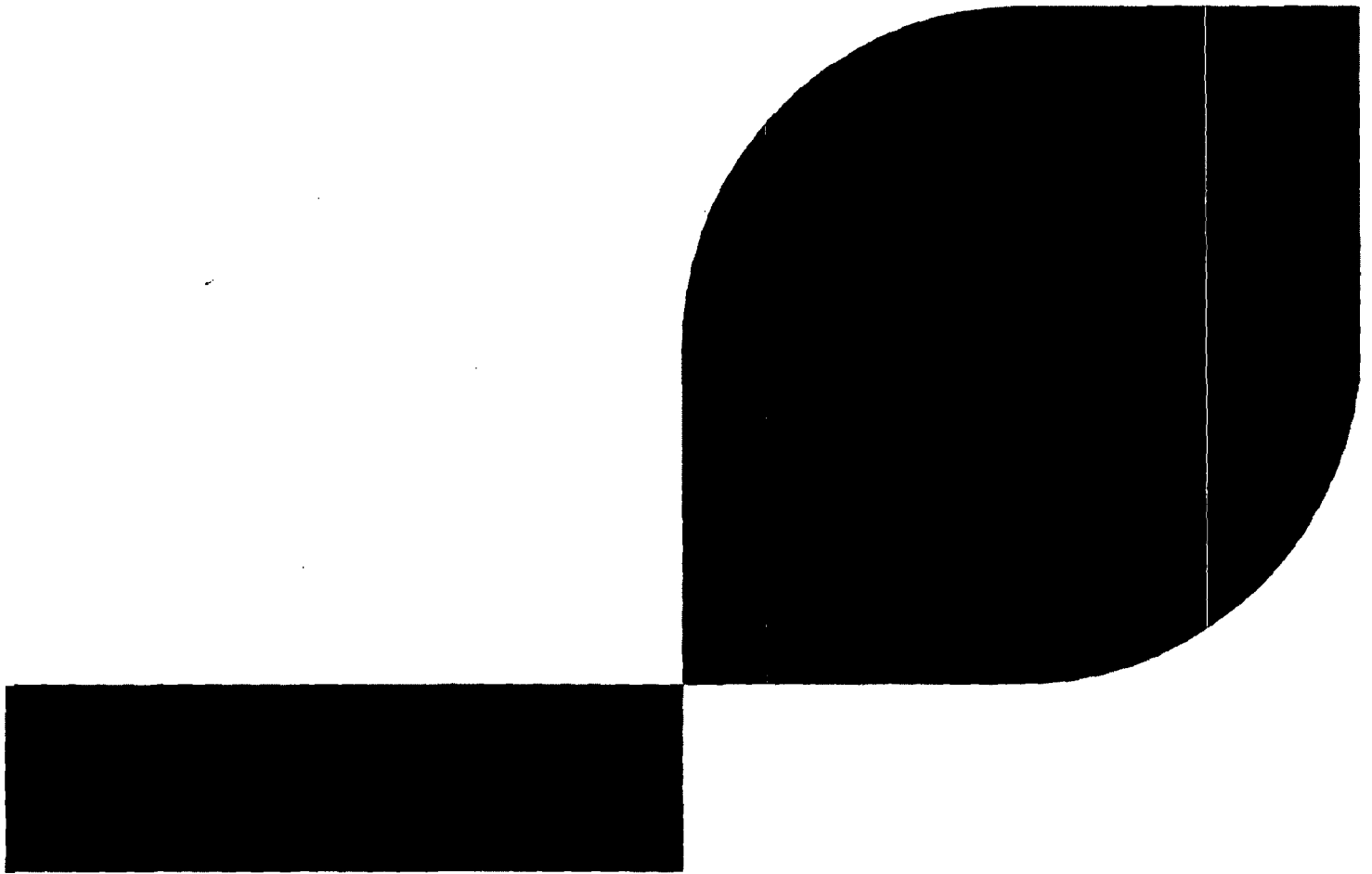
**Browns Ferry Nuclear Plant (BFN)
Units 1, 2, and 3**

Technical Specifications (TS) Change 478

**Addition of Analytical Methodologies to Technical Specification 5.6.5.b for Browns Ferry
1, 2, & 3, and Revision of Technical Specification 2.1.1.2 for Browns Ferry Unit 2, in
Support of ATRIUM-10 XM Fuel Use at Browns Ferry**

Fuel Cycle Design Report

Attached is the non proprietary version of the fuel cycle design report.



ANP-3145(NP)
Revision 0

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

August 2012

AREVA NP Inc.

ANP-3145(NP)
Revision 0

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

sja

AREVA NP Inc.

ANP-3145(NP)
Revision 0

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Nature of Changes

Item	Page	Description and Justification
1.	All	This is the initial release.

Contents

1.0	Introduction	1-1
2.0	Summary.....	2-1
3.0	Cycle 19 Fuel Cycle Design.....	3-1
3.1	General Description	3-1
3.2	Control Rod Patterns and Thermal Limits	3-1
3.3	Hot Excess Reactivity and Cold Shutdown Margin.....	3-1
4.0	References.....	4-1
Appendix A	Browns Ferry Unit 2 Cycle 19 Step-Through Depletion Summary, Control Rod Patterns, and Core Average Axial Power and Exposure Distributions.....	A-1
Appendix B	Elevation Views of the Browns Ferry Unit 2 Cycle 19 Fresh Reload Batch Fuel Assemblies	B-1
Appendix C	Browns Ferry Unit 2 Cycle 19 Fresh Fuel Locations	C-1
Appendix D	Browns Ferry Unit 2 Cycle 19 Radial Exposure and Power Distributions.....	D-1
Appendix E	Browns Ferry Unit 2 Cycle 18 EOC Projection Control Rod Patterns and Core Average Axial Power and Exposure Distributions.....	E-1

Tables

2.1	Browns Ferry Unit 2 Cycle 19 Energy and Key Results Summary	2-2
2.2	Browns Ferry Unit 2 Cycle 19 Fuel Cycle Design Assembly ID Range by Nuclear Fuel Type	2-4
3.1	Cycle 19 Core Composition and Design Parameters	3-3
3.2	Browns Ferry Unit 2 Cycle 19 Hot Operating Target k-eff versus Cycle Exposure	3-4
3.3	Browns Ferry Unit 2 Cycle 19 Cold Critical Target k-eff versus Cycle Exposure	3-4
3.4	Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary	3-5
3.5	Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary	3-6
3.6	Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary	3-7

Figures

2.1	Browns Ferry Unit 2 Cycle 19 Design Step-Through k-eff versus Cycle Exposure	2-5
2.2	Browns Ferry Unit 2 Cycle 19 Design Margin to Thermal Limits versus Cycle Exposure	2-5
3.1	Browns Ferry Unit 2 Cycle 19 Reference Loading Pattern	3-8
3.2	Browns Ferry Unit 2 Cycle 19 Upper Left Quarter Core Layout by Fuel Type	3-10
3.3	Browns Ferry Unit 2 Cycle 19 Upper Right Quarter Core Layout by Fuel Type	3-11
3.4	Browns Ferry Unit 2 Cycle 19 Lower Left Quarter Core Layout by Fuel Type	3-12
3.5	Browns Ferry Unit 2 Cycle 19 Lower Right Quarter Core Layout by Fuel Type	3-13

Nomenclature

ACE	AREVA NP critical power correlation
BOC	beginning of cycle
BOL	beginning of life
BWR	boiling water reactor
CSDM	cold shutdown margin
EOC	end of cycle
EOFP	end of full power capability
FFTR	final feedwater temperature reduction
GWd/MTU	gigawatt days per metric ton of initial uranium
HEXR	hot excess reactivity
LHGR	linear heat generation rate
MCPR	minimum critical power ratio
MICROBURN-B2	AREVA NP advanced BWR core simulator methodology with PPR capability
MWd/MTU	megawatt days per metric ton of initial uranium
NRC	Nuclear Regulatory Commission, U.S.
PPR	Pin Power Reconstruction. The PPR methodology accounts for variation in local rod power distributions due to neighboring assemblies and control state. The local rod power distributions are reconstructed based on the actual flux solution for each statepoint.
R Value	the larger of zero or the shutdown margin at BOC minus the minimum calculated shutdown margin in the cycle
SLC	standby liquid control
SPCB	AREVA NP (formerly Siemens Power Corporation) critical power correlation

1.0 Introduction

AREVA NP Inc. (AREVA) has performed a fuel cycle design and fuel management calculations for Cycle 19 operation in support of the introduction of ATRIUM™* 10XM fuel at the Browns Ferry Unit 2 BWR. These analyses have been performed with the approved AREVA neutronics methodology (References 1 through 5). The CASMO-4 lattice depletion code was used to generate nuclear data including cross sections and local power peaking factors. The MICROBURN-B2 three dimensional core simulator code, combined with the application of the applicable critical power correlation, was used to model the core. The MICROBURN-B2 pin power reconstruction (PPR) model was used to determine the thermal margins presented in this report.

Design results for the Cycle 19 reactor core loading including projected control rod patterns and evaluations of thermal and reactivity margins are presented. The Cycle 19 results are based on Cycle 18 core operational history as summarized in Table 2.1

* ATRIUM is a trademark of AREVA NP.

2.0 Summary

The Cycle 19 fresh batch size [] and batch average enrichment [] were determined to meet the energy requirements provided by Tennessee Valley Authority (TVA) (Reference 7). For a complete description of the fresh reload assemblies, see Reference 6. The loading of the Cycle 19 fuel as described in this report results in a projected Cycle 19 full power energy capability of $2,063 \pm 41$ GWd ($15,147 \pm 300$ MWd/MTU). Beyond the full power capability, the cycle has been designed to achieve 172 GWd additional energy via FFTR and power coastdown operation.

In order to obtain optimum operating flexibility, the projected control rod patterns for Cycle 19 were developed to be consistent with a conservative margin to thermal limits. The cycle design calculations also demonstrate adequate hot excess reactivity and cold shutdown margin throughout the cycle. Key results from the design analysis are summarized in Table 2.1. Table 2.2 summarizes the assembly identification range by nuclear fuel type batch for the Cycle 19 design. Figures 2.1 and 2.2 provide a summary of the cycle design step-through projection.

The Cycle 19 design satisfies the C-lattice Channel Bow criteria, as defined in GNF SIL-320, which is conservative for a D-lattice plant.

Peak rod average power was verified to not exceed 6.3 kW/ft at exposures of ≥ 54 GWd/MTU (Regulation Guide 1.183 requirement).

Table 2.1 Browns Ferry Unit 2 Cycle 19 Energy and Key Results Summary

Cycle Energy, GWd (Cycle Exposure, MWd/MTU)	
Cycle 18	
• Best estimate depletion to Nominal EOC 18	2,333 (17,224)
• Short window EOC 18	2,261 (16,688)
• Long window EOC 18	2,382 (17,582)
Cycle 19	
• EOFP Energy	2,063±41 (15,147±300)
• FFTR and power coastdown Energy	172 (1,261)
• EOC Energy	2,235±41 (16,408±300)
Key Results	
BOC CSDM, %Δk/k (based on short EOC 18)	1.47
Minimum CSDM, %Δk/k (based on short EOC 18)	1.47
Cycle Exposure of Minimum CSDM, MWd/MTU (short basis)	0
Cycle R Value, %Δk/k (short basis)	0.00
BOC CSDM, %Δk/k (based on nominal EOC 18)	1.66
Minimum CSDM, %Δk/k (based on nominal EOC 18)	1.66
Cycle Exposure of Minimum CSDM, MWd/MTU (nominal basis)	0
Cycle R Value, %Δk/k (nominal basis)	0.00
BOC CSDM, %Δk/k (based on long EOC 18)	1.81
Minimum CSDM, %Δk/k (based on long EOC 18)	1.81
Cycle Exposure of Minimum CSDM, MWd/MTU (long basis)	0
Cycle R Value, %Δk/k (long basis)	0.00
Minimum SLC SDM, %Δk/k (based on short EOC 18)	1.65
Cycle Exposure of Minimum SLC SDM, MWd/MTU (short basis)	0
Minimum SLC SDM, %Δk/k (based on nominal EOC 18)	2.01
Cycle Exposure of Minimum SLC SDM, MWd/MTU (nominal basis)	0
Minimum SLC SDM, %Δk/k (based on long EOC 18)	2.27
Cycle Exposure of Minimum SLC SDM, MWd/MTU (long basis)	0

Key Results	
BOC HEXR, $\% \Delta k/k$ (based on short EOC 18)	1.79
Maximum HEXR, $\% \Delta k/k$ (based on short EOC 18)	1.80
Cycle Exposure of Maximum HEXR, MWd/MTU (short basis)	9,000
BOC HEXR, $\% \Delta k/k$ (based on nominal EOC 18)	1.50
Maximum HEXR, $\% \Delta k/k$ (based on nominal EOC 18)	1.50
Cycle Exposure of Maximum HEXR, MWd/MTU (nominal basis)	9,000
BOC HEXR, $\% \Delta k/k$ (based on long EOC 18)	1.28
Maximum HEXR, $\% \Delta k/k$ (based on long EOC 18)	1.29
Cycle Exposure of Maximum HEXR, MWd/MTU (long basis)	9,000
Minimum MAPLHGR Margin, %	15.0
Exposure of Minimum MAPLHGR Margin, MWd/MTU	7,430
Minimum LHGR Margin, %	12.2
Exposure of Minimum LHGR Margin, MWd/MTU	846
Minimum CPR Margin, %	10.9
Exposure of Minimum CPR Margin, MWd/MTU	14,600

Table 2.2 Browns Ferry Unit 2 Cycle 19 Fuel Cycle Design Assembly ID Range by Nuclear Fuel Type

Nuclear Fuel Type	Number of Assemblies	Assembly ID Range
10	74	FBD001-FBD136
11	103	FBD137-FBD272
12	175	FBE001-FBE176
13	68	FBE177-FBE244
14	72	FBE245-FBE316
15	[]	[]
16	[]	[]
17	[]	[]

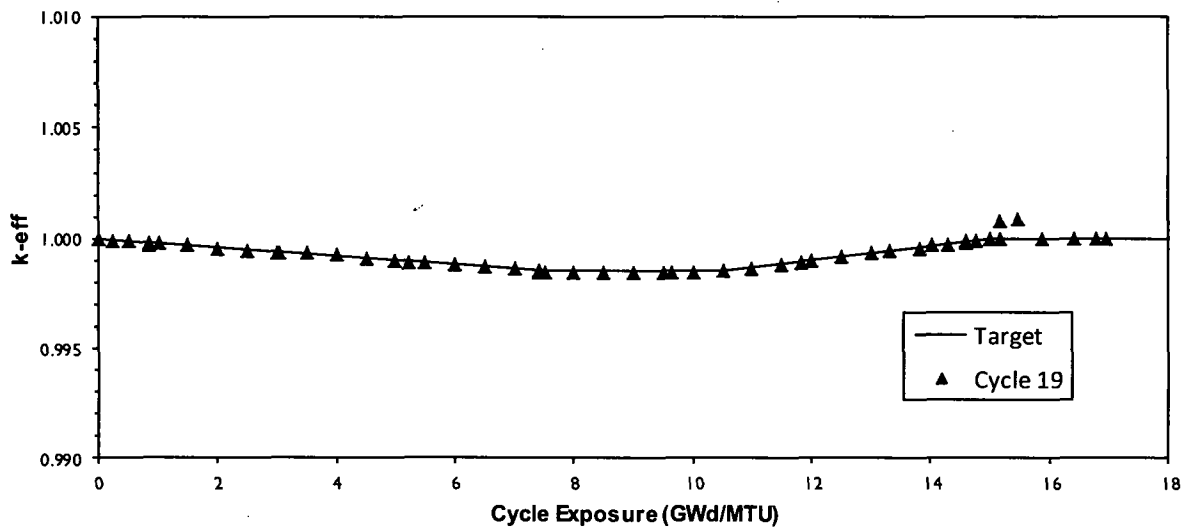


Figure 2.1 Browns Ferry Unit 2 Cycle 19 Design Step-Through k_{eff} versus Cycle Exposure

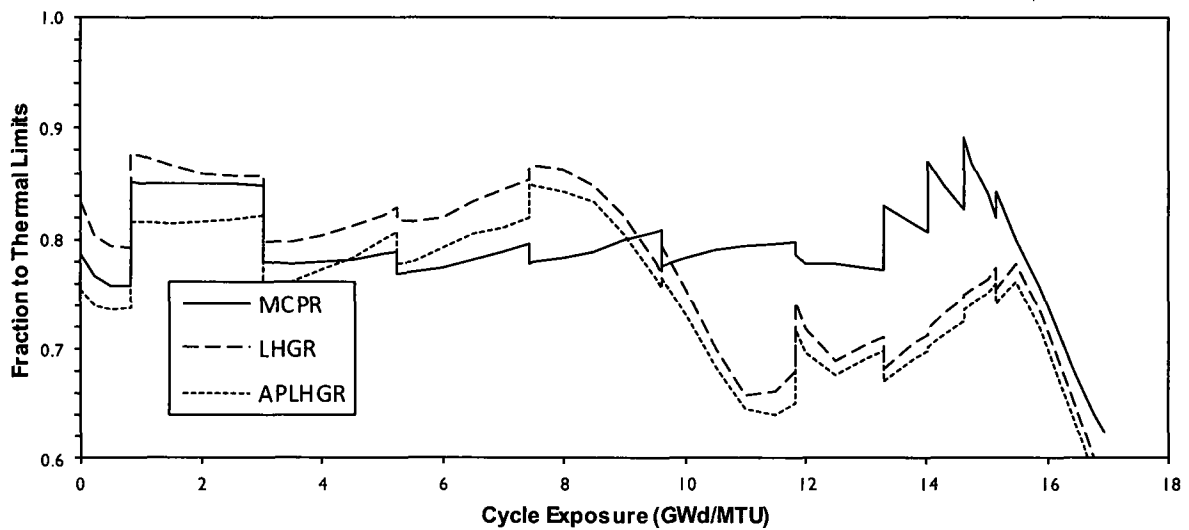


Figure 2.2 Browns Ferry Unit 2 Cycle 19 Design Margin to Thermal Limits versus Cycle Exposure

3.0 Cycle 19 Fuel Cycle Design

3.1 General Description

The assembly design for the Cycle 19 BFE2-19 fresh reload fuel for Browns Ferry Unit 2 is described in detail in Reference 6. Elevation views of the fresh reload fuel design axial enrichment and gadolinia distributions are shown in Appendix B, Figures B.1 through B.3. The loading pattern maintains full core symmetry within a scatter load fuel management scheme. This loading in conjunction with the control rod patterns presented in Appendix A shows acceptable power peaking and associated margins to limits for projected Cycle 19 operation. The analyses supporting this fuel cycle design were based on the core parameters shown in Table 3.1. Figures 3.1 through 3.5, along with Table 3.1 define the reference loading pattern used in the fuel cycle design. The specific core location of the fresh assemblies in Cycle 19 is provided in Appendix C. Key results for the cycle are summarized in Table 2.1.

3.2 Control Rod Patterns and Thermal Limits

Projected control rod patterns for Cycle 19 and resultant key operating parameters including thermal margins are shown in Appendix A. The thermal margins presented in this report were determined using the MICROBURN-B2 3D core simulator PPR model to provide adequate margin to thermal limits from Reference 7. A detailed summary of the core parameters resulting from the step-through projection analysis is provided in Tables A.1 and A.2. Limiting results from the step-through are summarized in Table 2.1 and in Figure 2.2. The hot operating target k_{eff} versus cycle exposure which was determined to be appropriate for Cycle 19 is shown in Table 3.2. The k_{eff} and margin to limits results from the design cycle depletion are presented graphically in Figures 2.1 and 2.2. The k_{eff} values presented in Figure 2.1 and in Appendix A are not bias corrected. Selected exposure and radial power distributions from the design step-through are presented in Appendix D. Projected control rod patterns near EOC18 are shown in Appendix E.

3.3 Hot Excess Reactivity and Cold Shutdown Margin

The cycle design calculations demonstrate adequate hot excess reactivity, SLC shutdown margin, and cold shutdown margin throughout the cycle. Key shutdown margin and R-Value results are presented in Table 2.1. The shutdown margin for Cycle 19 is in conformance with the Technical Specification limit of $R + 0.38 \% \Delta k/k$ at BOC. The cold target k_{eff} versus exposure determined to be appropriate for calculation of cold shutdown margin in Cycle 19 is

shown in Table 3.3. The core hot excess reactivity was calculated at full power with all rods out, 102.5 Mlb/hr core flow, with equilibrium xenon. Tables 3.4 through 3.6 summarize the Cycle 19 reactivity margins versus cycle exposure, including the SLC shutdown margin for the cycle.

Table 3.1 Cycle 19 Core Composition and Design Parameters

Fuel Description	Cycle Loaded	Nuclear Fuel Type	Number of Assemblies
ATRIUM-10 []	17	10	74
ATRIUM-10 []	17	11	103*
ATRIUM-10 []	18	12	175 [†]
ATRIUM-10 []	18	13	68
ATRIUM-10 []	18	14	72
ATRIUM 10XM []	19	15	[]
ATRIUM 10XM []	19	16	[]
ATRIUM 10XM []	19	17	[]
Number of Fuel Assemblies in Core			764
Total Number of Fresh Assemblies			272
Total Core Mass, MTU			136.20
Rated Thermal Power Level, MW _t			3,458
Rated Core Flow, Mlb/hr			102.5
Reference Pressure, psia			1,050 [‡]
Reference Inlet Subcooling, Btu/lbm			25.44 [§]

* Assembly FBD137 (FT 11) was reinserted from Cycle 17 as requested by TVA.

[†] Assembly FBE005 (FT 12) was withheld for inspection purposes.

[‡] Value is representative of MICROBURN-B2 input for dome pressure at rated conditions and varies depending on core state point.

[§] Value is typically determined by MICROBURN-B2 using a heat balance method based on nominal feedwater temperature and other parameters identified in the cycle specific plant parameters document.

**Table 3.2 Browns Ferry Unit 2 Cycle 19 Hot Operating Target k-eff
versus Cycle Exposure**

Cycle Exposure (MWd/MTU)	Hot Operating k-eff*
0.0	1.0000
7,500.0	0.9985
10,500.0	0.9985
15,000.0	1.0000
20,000.0	1.0000

**Table 3.3 Browns Ferry Unit 2 Cycle 19 Cold Critical Target k-eff
versus Cycle Exposure**

Cycle Exposure (MWd/MTU)	Cold Critical k-eff*
0.0	0.9960
5,000.0	0.9950
25,000.0	0.9950

* Values are linearly interpolated between cycle exposure points.

Table 3.4 Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary

Cycle Exposure (MWd/MTU)	Cold Shutdown Margin* (% $\Delta k/k$)	SLC Cold Shutdown Margin† (% $\Delta k/k$)	Hot Excess Reactivity‡ (% $\Delta k/k$)
0	1.47	1.65	1.79
250	1.56	1.86	1.70
500	1.69	2.04	1.61
1,000	1.83	2.18	1.58
2,000	2.02	2.36	1.58
3,000	2.23	2.53	1.56
4,000	2.40	2.67	1.56
5,000	2.59	2.76	1.59
6,000	2.79	2.83	1.65
7,000	2.95	2.87	1.73
8,000	3.10	2.83	1.80
9,000	3.21	2.86	1.80
9,500	3.23	2.90	1.79
10,000	3.09	2.95	1.77
10,500	2.99	3.01	1.76
11,000	2.92	3.07	1.72
11,500	2.92	3.15	1.68
12,000	2.98	3.28	1.61
12,500	2.96	3.41	1.56
13,000	2.95	3.54	1.49
13,800	3.05	3.84	1.27
14,013	3.09	3.94	1.19
14,600	3.22	4.32	0.89
15,147	3.20	4.75	0.54

* Based on short window EOC 18.

† Based on short window EOC 18, calculated at 366.0 °F ARO conditions.

‡ Based on short EOC 18.

Table 3.5 Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary

Cycle Exposure (MWd/MTU)	Cold Shutdown Margin* (% $\Delta k/k$)	SLC Cold Shutdown Margin [†] (% $\Delta k/k$)	Hot Excess Reactivity [‡] (% $\Delta k/k$)
0	1.66	2.01	1.50
250	1.76	2.24	1.39
500	1.90	2.43	1.29
1,000	2.07	2.58	1.25
2,000	2.30	2.78	1.24
3,000	2.52	2.95	1.22
4,000	2.74	3.10	1.21
5,000	2.94	3.19	1.24
6,000	3.13	3.26	1.31
7,000	3.30	3.27	1.41
8,000	3.44	3.24	1.49
9,000	3.53	3.27	1.50
9,500	3.40	3.30	1.49
10,000	3.27	3.35	1.47
10,500	3.20	3.41	1.45
11,000	3.16	3.48	1.41
11,500	3.23	3.57	1.36
12,000	3.23	3.70	1.28
12,500	3.24	3.83	1.22
13,000	3.25	3.97	1.13
13,800	3.42	4.32	0.86
14,013	3.47	4.44	0.75
14,600	3.47	4.85	0.39
15,147	3.53	5.36	-0.03

* Based on nominal window EOC 18.

† Based on nominal window EOC 18, calculated at 366.0 °F ARO conditions.

‡ Based on nominal EOC 18.

Table 3.6 Browns Ferry Unit 2 Cycle 19 Reactivity Margin Summary

Cycle Exposure (MWd/MTU)	Cold Shutdown Margin* (% $\Delta k/k$)	SLC Cold Shutdown Margin [†] (% $\Delta k/k$)	Hot Excess Reactivity [‡] (% $\Delta k/k$)
0	1.81	2.27	1.28
250	1.91	2.51	1.17
500	2.07	2.70	1.07
1,000	2.26	2.86	1.02
2,000	2.51	3.06	1.00
3,000	2.76	3.25	0.98
4,000	2.98	3.39	0.97
5,000	3.17	3.49	1.01
6,000	3.36	3.56	1.09
7,000	3.55	3.56	1.19
8,000	3.65	3.52	1.27
9,000	3.62	3.54	1.29
9,500	3.53	3.57	1.28
10,000	3.40	3.63	1.25
10,500	3.39	3.69	1.24
11,000	3.40	3.75	1.19
11,500	3.40	3.85	1.14
12,000	3.44	3.98	1.04
12,500	3.47	4.13	0.98
13,000	3.53	4.29	0.86
13,800	3.63	4.66	0.55
14,013	3.65	4.79	0.43
14,600	3.69	5.25	0.02
15,147	3.80	5.78	-0.44

* Based on long window EOC 18.

† Based on long window EOC 18, calculated at 366.0 °F ARO conditions.

‡ Based on long EOC 18.

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Figure 3.1 Browns Ferry Unit 2 Cycle 19 Reference Loading Pattern

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Figure 3.1 Browns Ferry Unit 2 Cycle 19 Reference Loading Pattern *(Continued)*

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Fuel Type	Description		Cycle Loaded	No. Per Quarter core
10	[]	17	18
11	[]	17	27
12	[]	18	43
13	[]	18	17
14	[]	18	18
15	[19	[]
16	[]	19	[]
17	[]	19	[]

**Figure 3.2 Browns Ferry Unit 2 Cycle 19 Upper Left Quarter Core
Layout by Fuel Type**

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Fuel Type	Description	Cycle Loaded	No. Per Quarter core
10	[]	17	18
11	[]	17	26
12	[]	18	44
13	[]	18	17
14	[]	18	
15	[]	19	[]
16	[]	19	[]
17	[]	19	[]

**Figure 3.3 Browns Ferry Unit 2 Cycle 19 Upper Right Quarter Core
Layout by Fuel Type**

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Fuel Type	Description	Cycle Loaded	No. Per Quarter core
10	[]	17	20
11	[]	17	24
12	[]	18	44
13	[]	18	17
14	[]	18	
15	[]	19	[]
16	[]	19	[]
17	[]	19	[]

**Figure 3.4 Browns Ferry Unit 2 Cycle 19 Lower Left Quarter Core
Layout by Fuel Type**

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Fuel Type	Description	Cycle Loaded	No. Per Quarter core
10	[]	17	18
11	[]	17	26
12	[]	18	44
13	[]	18	17
14	[]	18	
15	[]	19	[]
16	[]	19	[]
17	[]	19	[]

**Figure 3.5 Browns Ferry Unit 2 Cycle 19 Lower Right Quarter Core
Layout by Fuel Type**

4.0 References

1. EMF-2158(P)(A) Revision 0, *Siemens Power Corporation Methodology for Boiling Water Reactors: Evaluation and Validation of CASMO-4/MICROBURN-B2*, Siemens Power Corporation, October 1999.
2. EMF-2209(P)(A) Revision 3, *SPCB Critical Power Correlation*, AREVA NP, September 2009.
3. ANP-10298(P)(A) Revision 0, *ACE/ATRIUM 10XM Critical Power Correlation*, AREVA NP, March 2010.
4. ANP-10298(P)(A) Revision 0, Supplement 1P Revision 0, *Improved K-factor Model for ACE/ATRIUM 10XM Critical Power Correlation*, AREVA NP, December 2011.
5. ANP-3140(P) Revision 0, *Browns Ferry Units 1, 2, and 3 Improved K-factor Model for ACE/ATRIUM 10XM Critical Power Correlation*, AREVA NP, August 2012.
6. ANP-3144(P) Revision 0, *Nuclear Fuel Design Report BFE2-19 LAR ATRIUM 10XM*, AREVA NP, August 2012.
7. 38-9174818-001, TVA document, "Browns Ferry Unit 2 Cycle 18 Reload Requirement Specification (105% OLTP)," BFE-3215 Revision 1, April 2012.

Appendix A Browns Ferry Unit 2 Cycle 19 Step-Through Depletion Summary, Control Rod Patterns, and Core Average Axial Power and Exposure Distributions

Table A.1 Browns Ferry Unit 2 Cycle 19 Design Depletion Summary

Cycle Exposure (GWd/MT)	Calculated K-eff	Control Rod Density	Total Core Power MWt	Total Core Flow (Mlb/hr)	Ref. Pressure (psia)	Inlet Sub-Cooling (Btu/lb)	Void Fraction	Core Minimum CPR	Core Maximum LHGR (kW/ft)	Core Maximum APLHGR (kW/ft)
0.000	0.99999	4.68	3458.0	89.03	1050.11	29.50	0.470	1.791	11.74	8.88
0.250	0.99990	4.68	3458.0	92.76	1050.11	28.26	0.458	1.838	11.34	8.63
0.500	0.99985	4.68	3458.0	96.77	1050.11	27.03	0.447	1.860	11.21	8.57
0.844	0.99973	4.68	3458.0	97.99	1050.11	26.67	0.443	1.859	11.18	8.61
0.846	0.99977	4.32	3458.0	94.35	1050.11	27.76	0.452	1.655	12.38	9.51
1.000	0.99977	4.32	3458.0	94.73	1050.11	27.64	0.450	1.657	12.36	9.51
1.500	0.99967	4.32	3458.0	94.73	1050.11	27.64	0.448	1.659	12.21	9.52
2.000	0.99957	4.32	3458.0	94.56	1050.11	27.69	0.446	1.657	12.12	9.56
2.500	0.99947	4.32	3458.0	94.51	1050.11	27.71	0.443	1.659	12.10	9.62
3.000	0.99937	4.32	3458.0	94.48	1050.11	27.72	0.441	1.662	12.09	9.70
3.039	0.99936	4.32	3458.0	94.43	1050.11	27.73	0.441	1.662	12.09	9.71
3.040	0.99936	4.32	3458.0	94.41	1050.11	27.74	0.441	1.810	11.24	9.05
3.500	0.99931	4.32	3458.0	94.42	1050.11	27.74	0.440	1.813	11.26	9.14
4.000	0.99921	4.32	3458.0	94.00	1050.11	27.87	0.440	1.810	11.34	9.30
4.500	0.99906	4.32	3458.0	93.08	1050.11	28.16	0.441	1.803	11.46	9.49
5.000	0.99897	4.32	3458.0	91.89	1050.11	28.54	0.443	1.793	11.60	9.71
5.234	0.99890	4.32	3458.0	91.18	1050.11	28.77	0.445	1.787	11.68	9.82
5.235	0.99890	5.05	3458.0	99.09	1050.11	26.36	0.423	1.835	11.51	9.47
5.500	0.99889	5.05	3458.0	98.11	1050.11	26.64	0.425	1.831	11.49	9.52
6.000	0.99876	5.05	3458.0	96.51	1050.11	27.10	0.428	1.821	11.56	9.74
6.500	0.99867	5.05	3458.0	94.54	1050.11	27.70	0.433	1.806	11.75	9.93
7.000	0.99859	5.05	3458.0	92.37	1050.11	28.38	0.437	1.788	11.90	10.14
7.429	0.99849	5.05	3458.0	90.41	1050.11	29.03	0.441	1.772	12.03	10.19
7.430	0.99848	6.13	3458.0	102.18	1050.11	25.52	0.417	1.815	12.17	10.60
7.500	0.99845	6.13	3458.0	101.48	1050.11	25.71	0.418	1.810	12.21	10.58
8.000	0.99847	6.13	3458.0	99.75	1050.11	26.18	0.420	1.800	12.16	10.53
8.500	0.99848	6.13	3458.0	98.22	1050.11	26.61	0.419	1.789	11.91	10.38
9.000	0.99846	6.13	3458.0	96.93	1050.11	26.98	0.416	1.766	11.42	9.96
9.500	0.99846	6.13	3458.0	96.20	1050.11	27.20	0.412	1.748	10.73	9.37
9.624	0.99848	6.13	3458.0	95.88	1050.11	27.29	0.410	1.742	10.56	9.23
9.625	0.99847	6.31	3458.0	98.71	1050.11	26.47	0.410	1.816	10.92	9.60
10.000	0.99845	6.31	3458.0	98.15	1050.11	26.63	0.405	1.800	10.27	9.05
10.500	0.99850	6.31	3458.0	97.73	1050.11	26.75	0.397	1.783	9.40	8.29
11.000	0.99865	6.31	3458.0	97.94	1050.11	26.69	0.388	1.775	8.73	7.69
11.500	0.99881	6.31	3458.0	98.40	1050.11	26.56	0.377	1.771	8.76	7.68
11.818	0.99893	6.31	3458.0	98.94	1050.11	26.40	0.371	1.770	8.94	7.86
11.820	0.99891	3.78	3458.0	90.42	1050.11	29.03	0.419	1.792	10.07	8.92
12.000	0.99895	3.78	3458.0	92.13	1050.11	28.46	0.413	1.816	9.69	8.63
12.500	0.99913	3.78	3458.0	94.33	1050.11	27.76	0.397	1.827	9.00	7.94
13.000	0.99930	3.78	3458.0	97.74	1050.11	26.74	0.380	1.834	9.02	7.93
13.300	0.99940	3.78	3458.0	100.68	1050.11	25.92	0.370	1.840	9.14	8.14
13.300	0.99940	3.24	3458.0	88.92	1050.11	29.54	0.381	1.710	8.88	7.93
13.800	0.99955	3.24	3458.0	95.79	1050.11	27.32	0.360	1.744	9.31	8.31
14.013	0.99968	3.24	3458.0	99.52	1050.11	26.24	0.351	1.760	9.47	8.46
14.014	0.99967	2.16	3458.0	88.35	1050.11	29.74	0.370	1.632	9.50	8.48
14.300	0.99974	2.16	3458.0	94.38	1050.11	27.75	0.355	1.675	9.73	8.66
14.600	0.99984	2.16	3458.0	101.82	1050.11	25.62	0.339	1.717	9.95	8.84
14.600	0.99987	0.00	3458.0	88.00	1050.11	29.86	0.376	1.593	9.60	8.68
14.750	0.99988	0.00	3458.0	92.75	1050.11	28.26	0.366	1.636	9.65	8.74
15.000	0.99998	0.00	3458.0	99.88	1050.11	26.14	0.350	1.689	9.79	8.86
15.147	1.00080	0.00	3458.0	107.63	1050.11	24.16	0.335	1.732	9.93	8.97
15.147	0.99999	0.00	3458.0	92.67	1044.83	34.44	0.339	1.684	9.53	8.64
15.477	1.00087	0.00	3458.0	107.63	1044.83	29.46	0.311	1.777	9.81	8.86
15.875	0.99999	0.00	3237.0	107.63	1039.94	27.39	0.297	1.902	9.30	8.35
16.408	0.99996	0.00	2837.7	107.63	1031.09	23.68	0.271	2.176	8.36	7.45
16.764	0.99998	0.00	2565.2	107.63	1025.06	21.17	0.253	2.386	7.66	6.80
16.941	0.99999	0.00	2430.3	107.63	1022.07	19.94	0.243	2.506	7.30	6.48

Table A.2 Browns Ferry Unit 2 Cycle 19 Design Depletion Thermal Margin Summary

Cycle Exposure (Gwd/MT)	Calculated K-eff	Control Rod Density	Core Limiting CPR	Fraction of Limiting CPR	Core Limiting LHGR (kW/ft)	Fraction of Limiting LHGR	Core Limiting APLHGR (kW/ft)	Fraction of Limiting APLHGR
0.000	0.99999	4.685	1.791	0.787	11.74	0.833	8.67	0.755
0.250	0.99990	4.685	1.838	0.767	11.34	0.804	8.45	0.740
0.500	0.99985	4.685	1.860	0.758	11.21	0.795	8.38	0.737
0.844	0.99973	4.685	1.859	0.758	11.18	0.793	8.34	0.739
0.846	0.99977	4.324	1.655	0.852	12.38	0.878	9.29	0.816
1.000	0.99977	4.324	1.657	0.851	12.36	0.876	9.26	0.816
1.500	0.99967	4.324	1.659	0.850	12.21	0.866	9.14	0.814
2.000	0.99957	4.324	1.657	0.851	12.12	0.860	9.05	0.815
2.500	0.99947	4.324	1.659	0.850	12.10	0.858	8.99	0.817
3.000	0.99937	4.324	1.662	0.848	12.09	0.858	8.94	0.821
3.039	0.99936	4.324	1.662	0.848	12.09	0.858	8.94	0.822
3.040	0.99936	4.324	1.810	0.779	11.24	0.797	8.24	0.757
3.500	0.99931	4.324	1.813	0.778	11.26	0.798	8.18	0.762
4.000	0.99921	4.324	1.810	0.779	11.34	0.804	8.21	0.772
4.500	0.99906	4.324	1.803	0.782	11.46	0.812	8.25	0.784
5.000	0.99897	4.324	1.793	0.786	11.60	0.822	8.32	0.799
5.234	0.99890	4.324	1.787	0.789	11.68	0.828	8.36	0.806
5.235	0.99890	5.045	1.835	0.768	11.51	0.817	8.37	0.778
5.500	0.99889	5.045	1.831	0.770	11.49	0.815	8.33	0.779
6.000	0.99876	5.045	1.821	0.774	11.56	0.820	8.05	0.793
6.500	0.99867	5.045	1.806	0.781	11.75	0.834	8.16	0.805
7.000	0.99859	5.045	1.788	0.788	11.90	0.844	8.14	0.811
7.429	0.99849	5.045	1.772	0.796	12.03	0.853	8.54	0.819
7.430	0.99848	6.126	1.815	0.777	12.17	0.863	8.52	0.850
7.500	0.99845	6.126	1.810	0.779	12.21	0.866	8.60	0.849
8.000	0.99847	6.126	1.800	0.783	12.16	0.862	8.63	0.843
8.500	0.99848	6.126	1.789	0.788	11.91	0.848	8.43	0.833
9.000	0.99846	6.126	1.766	0.799	11.40	0.821	8.07	0.805
9.500	0.99846	6.126	1.748	0.807	10.70	0.780	7.48	0.765
9.624	0.99848	6.126	1.742	0.809	10.53	0.769	7.37	0.757
9.625	0.99847	6.306	1.816	0.776	10.92	0.795	7.67	0.765
10.000	0.99845	6.306	1.800	0.783	10.27	0.754	7.27	0.731
10.500	0.99850	6.306	1.783	0.791	9.39	0.701	6.75	0.684
11.000	0.99865	6.306	1.775	0.794	6.63	0.659	6.28	0.646
11.500	0.99881	6.306	1.771	0.796	7.05	0.663	6.22	0.640
11.818	0.99893	6.306	1.770	0.797	7.19	0.680	6.59	0.652
11.820	0.99891	3.784	1.792	0.787	10.04	0.743	7.06	0.718
12.000	0.99895	3.784	1.816	0.777	9.69	0.719	6.72	0.697
12.500	0.99913	3.784	1.827	0.777	6.78	0.690	6.59	0.677
13.000	0.99930	3.784	1.834	0.774	7.07	0.704	6.67	0.691
13.300	0.99940	3.784	1.840	0.772	7.10	0.711	6.79	0.699
13.300	0.99940	3.243	1.710	0.830	6.92	0.683	6.53	0.672
13.800	0.99955	3.243	1.744	0.814	7.07	0.705	6.66	0.691
14.013	0.99968	3.243	1.760	0.807	7.11	0.712	6.70	0.698
14.014	0.99967	2.162	1.632	0.870	7.18	0.719	6.73	0.702
14.300	0.99974	2.162	1.675	0.848	7.51	0.732	6.91	0.713
14.600	0.99984	2.162	1.717	0.827	7.62	0.748	6.99	0.725
14.600	0.99987	0.000	1.593	0.891	7.47	0.749	7.14	0.736
14.750	0.99988	0.000	1.636	0.868	7.50	0.754	7.17	0.741
15.000	0.99998	0.000	1.689	0.841	7.56	0.764	7.22	0.750
15.147	1.00080	0.000	1.732	0.820	7.72	0.775	7.31	0.760
15.147	0.99999	0.000	1.684	0.843	7.39	0.754	7.12	0.741
15.477	1.00087	0.000	1.777	0.799	7.56	0.777	7.28	0.762
15.875	0.99999	0.000	1.902	0.756	7.19	0.734	6.81	0.718
16.408	0.99996	0.000	2.176	0.684	6.36	0.657	6.09	0.640
16.764	0.99998	0.000	2.386	0.641	5.83	0.599	5.50	0.582
16.941	0.99999	0.000	2.506	0.625	5.54	0.571	5.21	0.554

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	17206.5
Exposure: MWd/MTU (GWd)	0.0 (0.00)		
Delta E: MWd/MTU, (GWd)	0.0 (0.00)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-29.50		
Flow: Mlb/hr	89.03 (86.85 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.130 3.043 10 0.551 1.028 45 14
		24	0.402 9.155 11 0.605 1.053 39 12
		23	0.544 12.501 12 1.177 1.303 23 44
		22	0.653 14.930 13 1.038 1.259 27 20
		21	0.716 16.603 14 1.009 1.267 23 48
		20	0.770 17.680 15 1.077 1.191 27 54
		19	0.810 18.606 16 1.177 1.275 19 46
		18	0.844 19.060 17 1.163 1.275 21 44
		17	0.859 18.813
		16	0.913 18.963
		15	0.949 19.244
		14	0.979 19.396
		13	1.074 18.985
		12	1.139 19.383
		11	1.200 19.634
		10	1.268 19.751
		9	1.353 20.268
		8	1.430 20.396
		7	1.497 20.276
		6	1.583 20.815
		5	1.613* 20.943*
		4	1.535 20.300
		3	1.387 18.978
		2	1.070 14.651
		Bottom 1	0.283 4.227
			% AXIAL TILT -28.371 -7.663
			AVG BOT 8ft/12ft 1.1624 1.0467
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.68		
k-effective:	0.99999		
Void Fraction:	0.470		
Core Delta-P: psia	19.818		
Core Plate Delta-P: psia	15.263		
Coolant Temp: Deg-F	548.2		
In Channel Flow: Mlb/hr	78.39	Active Channel Flow: Mlb/hr	75.64
Total Bypass Flow (%):	12.0	(of total core flow)	
Total Water Rod Flow (%):	3.1	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.303	12	23	44	1.791	0.787	17	19	8.67	0.755	25.2	12	19	11.74	0.833	0.0
1.303	12	19	44	1.796	0.785	17	43	8.62	0.753	25.5	12	17	11.70	0.829	0.0
1.299	12	17	42	1.811	0.779	17	37	8.61	0.747	24.7	12	23	11.68	0.828	0.0
1.292	12	15	26	1.813	0.778	17	15	8.44	0.745	26.8	12	39	11.64	0.826	0.0
1.291	12	17	24	1.832	0.769	12	41	8.38	0.742	27.1	12	45	11.58	0.821	0.0
1.287	12	21	46	1.833	0.769	16	19	8.47	0.742	25.8	12	17	11.57	0.821	0.0
1.283	12	15	40	1.834	0.769	16	15	8.42	0.732	25.0	12	45	11.51	0.816	0.0
1.281	12	35	16	1.834	0.769	17	13	8.35	0.732	25.9	12	25	11.43	0.810	0.0
1.275	17	21	44	1.836	0.768	17	21	8.14	0.724	27.6	13	43	11.41	0.809	0.0
1.275	16	19	46	1.836	0.768	12	17	8.12	0.723	27.7	13	45	11.40	0.809	0.0

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.1 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 0.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	17456.3
Exposure: MWd/MTU (Gwd)	250.0 (34.05)		
Delta E: MWd/MTU, (Gwd)	250.0 (34.05)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.26		
Flow: Mlb/hr	92.76 (90.50 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.135 3.080 10 0.553 1.026 45 14
		24	0.419 9.264 11 0.606 1.051 39 12
		23	0.566 12.647 12 1.178 1.303 23 44
		22	0.678 15.107 13 1.039 1.261 19 34
		21	0.742 16.797 14 1.012 1.267 23 48
		20	0.795 17.888 15 1.074 1.189 27 54
		19	0.836 18.825 16 1.172 1.269 19 46
		18	0.869 19.288 17 1.161 1.271 21 44
		17	0.883 19.044
		16	0.937 19.195
		15	0.973 19.484
		14	1.001 19.644
		13	1.095 19.243
		12	1.156 19.657
		11	1.213 19.922
		10	1.276 20.054
		9	1.354 20.590
		8	1.423 20.736
		7	1.479 20.631
		6	1.550 21.189
		5	1.563* 21.321*
		4	1.469 20.659
		3	1.313 19.300
		2	1.007 14.898
		Bottom 1	0.266 4.296
		% AXIAL TILT	-26.082 -7.880
		AVG BOT 8ft/12ft	1.1508 1.0478
Control Rod Density: %	4.68		
k-effective:	0.99990		
Void Fraction:	0.458		
Core Delta-P: psia	20.921		
Core Plate Delta-P: psia	16.366		
Coolant Temp: Deg-F	548.2		
In Channel Flow: Mlb/hr	81.79	Active Channel Flow: Mlb/hr	78.97
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00004		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp. FT	IR	Value	Margin	Exp. FT	IR
1.303	12	23	44	1.838	0.767	17	17	8.45	0.740	25.8	12	11.34	0.804	0.7	17
1.301	12	19	44	1.839	0.767	17	19	8.41	0.738	26.1	12	11.28	0.800	0.7	17
1.298	12	17	42	1.850	0.762	17	37	8.41	0.733	25.2	12	11.28	0.800	0.7	17
1.292	12	15	26	1.853	0.761	17	15	8.22	0.730	27.3	12	11.23	0.796	0.7	17
1.291	12	17	38	1.872	0.753	12	41	8.27	0.727	26.3	12	11.16	0.792	0.7	17
1.286	12	21	46	1.873	0.753	17	13	8.17	0.726	27.6	12	11.16	0.791	0.7	17
1.282	12	15	40	1.874	0.752	17	21	8.21	0.718	25.5	12	11.09	0.787	0.7	16
1.281	12	35	16	1.875	0.752	16	19	8.15	0.717	26.4	12	11.03	0.783	0.7	17
1.271	17	21	44	1.876	0.752	12	17	7.79	0.709	30.1	13	11.01	0.781	0.7	17
1.270	12	33	18	1.876	0.752	16	15	7.92	0.708	28.1	13	11.01	0.781	0.7	16

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.2 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 250.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	17706.3
Exposure: MWd/MTU (Gwd)	500.0 (68.10)		
Delta E: MWd/MTU, (Gwd)	250.0 (34.05)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.03		
Flow: Mlb/hr	96.77 (94.41 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.139 3.118 10 0.551 1.027 45 14
		24	0.430 9.376 11 0.605 1.053 39 12
		23	0.581 12.799 12 1.179 1.306 23 44
		22	0.695 15.289 13 1.039 1.261 19 34
		21	0.758 16.996 14 1.011 1.269 23 48
		20	0.810 18.101 15 1.073 1.188 27 54
		19	0.849 19.048 16 1.172 1.271 19 46
		18	0.882 19.521 17 1.162 1.274 21 44
		17	0.895 19.280
		16	0.950 19.431
		15	0.985 19.730
		14	1.012 19.896
		13	1.106 19.505
		12	1.166 19.933
		11	1.221 20.212
		10	1.282 20.359
		9	1.357 20.913
		8	1.421 21.075
		7	1.471 20.982
		6	1.534 21.556
		5	1.535* 21.690*
		4	1.430 21.004
		3	1.266 19.607
		2	0.967 15.133
		Bottom 1	0.257 4.363
			% AXIAL TILT -24.781 -8.066
			AVG BOT 8ft/12ft 1.1440 1.0487
Control Rod Density: %	4.68		
k-effective:	0.99985		
Void Fraction:	0.447		
Core Delta-P: psia	22.235		
Core Plate Delta-P: psia	17.679		
Coolant Temp: Deg-F	548.2		
In Channel Flow: Mlb/hr	85.40	Active Channel Flow: Mlb/hr	82.50
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.306	12	23	44	1.860	0.758	17	17	8.38	0.737	26.3	12	11.21	0.795	1.4	17
1.304	12	19	44	1.861	0.758	17	19	8.33	0.735	26.6	12	11.15	0.791	1.4	17
1.301	12	17	42	1.874	0.752	17	37	8.33	0.729	25.8	12	11.14	0.790	1.4	17
1.295	12	15	36	1.876	0.752	17	15	8.14	0.726	27.8	12	11.08	0.786	1.4	17
1.294	12	17	38	1.895	0.744	17	13	8.18	0.723	26.8	12	11.01	0.781	1.4	17
1.289	12	21	46	1.897	0.743	17	21	8.08	0.722	28.1	12	11.01	0.781	1.4	17
1.285	12	15	40	1.900	0.742	16	19	8.12	0.713	26.1	12	10.95	0.776	1.4	16
1.284	12	25	46	1.901	0.742	16	15	8.06	0.713	27.0	12	10.89	0.772	1.3	17
1.274	17	21	44	1.906	0.740	12	41	7.84	0.703	28.6	13	10.86	0.770	1.3	16
1.271	12	33	18	1.909	0.739	12	17	7.82	0.702	28.7	13	10.85	0.769	1.3	17

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.3 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	18050.5
Exposure: MWd/MTU (Gwd)	844.2 (114.98)		
Delta E: MWd/MTU, (Gwd)	344.2 (46.88)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.67		
Flow: Mlb/hr	97.99 (95.60 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.142 3.172 10 0.547 1.029 45 14
		24	0.438 9.534 11 0.601 1.055 39 12
		23	0.591 13.013 12 1.179 1.307 23 44
		22	0.705 15.545 13 1.037 1.259 19 34
		21	0.766 17.275 14 1.007 1.271 23 48
		20	0.816 18.399 15 1.074 1.188 27 54
		19	0.854 19.360 16 1.177 1.278 19 46
		18	0.887 19.844 17 1.167 1.282 21 44
		17	0.899 19.608
		16	0.954 19.760
		15	0.990 20.070
		14	1.016 20.246
		13	1.109 19.868
		12	1.169 20.316
		11	1.223 20.612
		10	1.282 20.780
		9	1.356 21.358
		8	1.419 21.541
		7	1.467 21.464
		6	1.526* 22.059
		5	1.523 22.192*
		4	1.414 21.471
		3	1.247 20.019
		2	0.951 15.448
		Bottom 1	0.255 4.453
			% AXIAL TILT -24.172 -8.295
			AVG BOT 8ft/12ft 1.1406 1.0498
Control Rod Density: %	4.68		
k-effective:	0.99973		
Void Fraction:	0.443		
Core Delta-P: psia	22.632		
Core Plate Delta-P: psia	18.075		
Coolant Temp: Deg-F	548.2		
In Channel Flow: Mlb/hr	86.52	Active Channel Flow: Mlb/hr	83.59
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00005		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.307	12	23	44	1.859	0.758	17	17	8.34	0.739	27.0	12	19	11.18	0.793	2.3
1.306	12	19	44	1.860	0.758	17	19	8.30	0.736	27.3	12	17	11.12	0.788	2.3
1.303	12	17	42	1.874	0.752	17	37	8.28	0.730	26.5	12	23	11.10	0.787	2.3
1.296	12	15	36	1.876	0.752	17	15	8.11	0.727	28.5	12	39	11.04	0.783	2.3
1.295	12	17	38	1.895	0.744	17	13	8.05	0.724	28.8	12	45	10.97	0.778	2.3
1.290	12	21	46	1.896	0.743	17	21	8.14	0.723	27.5	12	17	10.96	0.777	2.3
1.286	12	15	40	1.900	0.742	16	19	8.01	0.713	27.7	12	25	10.91	0.774	2.3
1.284	12	25	46	1.901	0.742	16	15	8.07	0.713	26.8	12	15	10.84	0.769	2.2
1.282	17	21	44	1.917	0.736	12	41	7.80	0.705	29.3	13	43	10.82	0.767	2.2
1.278	17	23	46	1.919	0.735	12	23	7.78	0.703	29.4	13	45	10.78	0.765	2.2

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.4 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 844.2 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	18206.3
Exposure: MWd/MTU (Gwd)	1000.0 (136.20)		
Delta E: MWd/MTU, (Gwd)	154.2 (21.00)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.64		
Flow: Mlb/hr	94.73 (92.42 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.139 3.196 10 0.548 1.011 31 30
1		24	0.427 9.604 11 0.600 1.065 11 22
3		23	0.575 13.107 12 1.182 1.412 15 32
5		22	0.685 15.658 13 1.027 1.295 11 26
7		21	0.745 17.398 14 1.002 1.309 13 24
9		20	0.796 18.530 15 1.074 1.232 7 28
11		19	0.835 19.498 16 1.181 1.343 11 28
13		18	0.870 19.988 17 1.170 1.381 13 30
15		17	0.886 19.755
17		16	0.947 19.907
19		15	0.986 20.224
21		14	1.015 20.404
23		13	1.109 20.033
25		12	1.171 20.490
27		11	1.227 20.794
29		10	1.287 20.971
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.362 21.561
		8	1.426 21.753
		7	1.476 21.684
		6	1.538 22.287
		5	1.540* 22.421*
		4	1.438 21.685
		3	1.277 20.209
		2	0.979 15.593
		Bottom 1	0.264 4.495
Control Rod Density: %	4.32		
k-effective:	0.99977		
Void Fraction:	0.450		
Core Delta-P: psia	21.564	% AXIAL TILT	-25.452 -8.406
Core Plate Delta-P: psia	17.009	AVG BOT 8ft/12ft	1.1489 1.0504
Coolant Temp: Deg-F	548.2		
In Channel Flow: Mlb/hr	83.57	Active Channel Flow: Mlb/hr	80.71
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR			LHGR		
Value	FT	IR JR	Value	Margin	FT IR JR	Value	Margin	Exp. FT IR JR K	Value	Margin	Exp. FT IR JR K
1.412	12	15 32	1.657	0.851	17 13 30	9.26	0.816	26.6 12 45 30 5	12.36	0.876	1.1 17 13 30 5
1.390	12	13 28	1.683	0.838	17 15 28	9.01	0.798	27.0 12 47 34 5	12.23	0.868	2.4 17 15 34 5
1.381	17	13 30	1.702	0.828	12 15 32	8.83	0.788	28.0 12 49 32 5	12.07	0.856	2.3 17 17 32 5
1.375	17	15 34	1.706	0.827	17 13 26	8.88	0.787	27.1 12 45 26 5	11.95	0.847	2.6 17 47 36 5
1.374	12	15 36	1.721	0.819	12 13 28	8.82	0.781	27.1 12 43 28 5	11.82	0.838	2.7 17 17 26 5
1.370	12	11 30	1.729	0.816	12 49 32	8.45	0.754	27.9 12 17 24 5	10.18	0.828	28.6 12 45 32 5
1.369	12	17 34	1.742	0.809	17 9 30	8.41	0.746	27.2 12 41 30 5	11.59	0.822	2.5 17 51 32 5
1.360	17	17 32	1.768	0.798	12 15 26	9.51	0.743	1.4 17 47 32 5	11.56	0.820	2.5 16 49 34 5
1.343	16	11 28	1.770	0.796	17 17 30	8.08	0.739	30.6 14 47 24 5	11.55	0.819	2.7 17 15 24 5
1.336	17	13 26	1.775	0.794	16 11 28	8.18	0.738	29.1 12 45 22 5	9.58	0.814	33.3 12 47 34 5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.6 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 1,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	18706.3
Exposure: MWd/MTU (GWd)	1500.0 (204.30)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.64		
Flow: Mlb/hr	94.73 (92.42 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.143 3.274 10 0.543 1.010 13 46
		24	0.437 9.833 11 0.595 1.067 11 22
		23	0.587 13.415 12 1.180 1.408 15 32
		22	0.699 16.025 13 1.023 1.293 11 26
		21	0.756 17.797 14 0.995 1.309 13 24
		20	0.805 18.956 15 1.077 1.233 7 28
		19	0.842 19.944 16 1.188 1.350 11 28
		18	0.876 20.452 17 1.179 1.390 13 30
		17	0.891 20.228
		16	0.952 20.383
		15	0.991 20.719
		14	1.019 20.914
		13	1.112 20.562
		12	1.172 21.048
		11	1.227 21.379
		10	1.286 21.584
		9	1.359 22.209
		8	1.421 22.432
		7	1.468 22.385
		6	1.527* 23.018
		5	1.525 23.152*
		4	1.421 22.367
		3	1.259 20.812
		2	0.964 16.056
		Bottom 1	0.262 4.628
			% AXIAL TILT -24.663 -8.734
			AVG BOT 8ft/12ft 1.1444 1.0520
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.32		
k-effective:	0.99967		
Void Fraction:	0.448		
Core Delta-P: psia	21.542		
Core Plate Delta-P: psia	16.988		
Coolant Temp: Deg-F	548.1		
In Channel Flow: Mlb/hr	83.59	Active Channel Flow: Mlb/hr	80.73
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00006		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp.	FT	IR JR	K	Value	Margin	Exp.
1.408	12	15 32	1.659	0.850	17	13 30	9.14	0.814	27.7	12	45 30	5	12.21	0.866	2.6 17
1.390	17	13 30	1.681	0.839	17	15 28	8.91	0.797	28.2	12	47 34	5	12.12	0.859	3.9 17
1.387	12	13 28	1.704	0.828	17	13 26	8.79	0.787	28.2	12	45 26	5	11.94	0.847	3.8 17
1.384	17	15 34	1.713	0.823	12	15 32	8.72	0.786	29.1	12	49 32	5	11.83	0.839	4.0 17
1.372	12	15 36	1.730	0.815	12	13 28	8.70	0.778	28.2	12	43 28	5	11.72	0.831	4.1 17
1.367	17	17 32	1.739	0.811	12	49 32	8.38	0.754	28.9	12	17 24	5	10.00	0.823	29.9 12
1.366	12	11 30	1.746	0.808	17	9 30	9.52	0.744	2.6	17	47 32	5	11.48	0.815	4.1 17
1.364	12	17 34	1.774	0.795	17	17 30	8.28	0.741	28.2	12	41 30	5	11.46	0.813	3.8 16
1.350	16	11 28	1.775	0.795	12	15 26	8.02	0.740	31.6	14	47 24	5	11.45	0.812	3.9 17
1.346	17	13 26	1.775	0.794	16	11 28	8.13	0.740	30.1	12	45 22	5	9.44	0.812	34.5 12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.7 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 1,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	19206.3
Exposure: MWd/MTU (Gwd)	2000.0 (272.41)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.69		
Flow: Mlb/hr	94.56 (92.26 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure Zone Avg. Max. IR JR	
		Top 25 0.148 3.355 10 0.539 1.012 13 46	
		24 0.448 10.068 11 0.590 1.069 11 22	
		23 0.601 13.730 12 1.178 1.405 15 32	
		22 0.712 16.399 13 1.019 1.292 11 26	
		21 0.768 18.202 14 0.988 1.309 13 24	
		20 0.814 19.386 15 1.080 1.233 7 28	
		19 0.850 20.394 16 1.196 1.358 11 28	
		18 0.882 20.920 17 1.187 1.400 13 30	
		17 0.896 20.703	
		16 0.957 20.861	
		15 0.994 21.217	
		14 1.021 21.425	
		13 1.113 21.092	
		12 1.171 21.606	
		11 1.224 21.963	
		10 1.282 22.195	
		9 1.354 22.855	
		8 1.414 23.108	
		7 1.459 23.083	
		6 1.516* 23.744	
		5 1.512 23.876*	
		4 1.407 23.041	
		3 1.245 21.408	
		2 0.952 16.512	
		Bottom 1 0.260 4.761	
		% AXIAL TILT -23.885 -9.024	
		AVG BOT 8ft/12ft 1.1396 1.0535	
Control Rod Density: %	4.32		
k-effective:	0.99957		
Void Fraction:	0.446		
Core Delta-P: psia	21.465		
Core Plate Delta-P: psia	16.911		
Coolant Temp: Deg-F	548.1		
In Channel Flow: Mlb/hr	83.45	Active Channel Flow: Mlb/hr	80.60
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00006		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.405	12	15	32	1.657	0.851	17	13	9.05	0.815	28.9	12	12.12	0.860	5.0	17
1.400	17	13	30	1.679	0.840	17	15	8.84	0.799	29.3	12	12.06	0.855	5.3	17
1.394	17	15	34	1.702	0.828	17	13	8.73	0.789	29.3	12	11.87	0.842	5.2	17
1.385	12	13	28	1.720	0.820	12	15	8.64	0.787	30.2	12	11.74	0.833	5.4	17
1.375	17	17	32	1.736	0.812	12	47	8.61	0.777	29.3	12	11.66	0.827	5.5	17
1.371	12	15	36	1.746	0.808	12	49	8.31	0.756	30.0	12	9.86	0.821	31.2	12
1.363	12	11	30	1.749	0.806	17	9	9.56	0.747	3.7	17	11.45	0.812	5.5	17
1.361	12	17	34	1.774	0.795	17	15	7.97	0.742	32.6	14	9.34	0.812	35.6	12
1.358	16	11	28	1.775	0.794	16	11	9.50	0.742	4.2	17	11.42	0.810	5.2	16
1.357	17	13	26	1.777	0.793	17	17	8.08	0.742	31.2	12	11.34	0.804	5.2	17

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.8 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 2,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	19706.3
Exposure: MWd/MTU (GWd)	2500.0 (340.51)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.71		
Flow: Mlb/hr	94.51 (92.20 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.152 3.439 10 0.534 1.014 13 46
		24	0.460 10.308 11 0.585 1.070 11 22
		23	0.615 14.051 12 1.176 1.403 15 32
		22	0.726 16.781 13 1.016 1.291 11 26
		21	0.779 18.613 14 0.980 1.309 13 38
		20	0.823 19.821 15 1.083 1.234 7 28
		19	0.857 20.848 16 1.203 1.366 11 28
		18	0.887 21.390 17 1.196 1.410 13 30
		17	0.900 21.181
		16	0.960 21.342
		15	0.996 21.715
		14	1.021 21.936
		13	1.112 21.622
		12	1.169 22.164
		11	1.220 22.545
		10	1.277 22.805
		9	1.348 23.499
		8	1.407 23.780
		7	1.451 23.777
		6	1.507* 24.464
		5	1.501 24.594*
		4	1.396 23.710
		3	1.234 21.999
		2	0.943 16.963
		Bottom 1	0.259 4.893
			% AXIAL TILT -23.171 -9.280
			AVG BOT 8ft/12ft 1.1349 1.0547
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.32		
k-effective:	0.99947		
Void Fraction:	0.443		
Core Delta-P: psia	21.451		
Core Plate Delta-P: psia	16.897		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	83.40	Active Channel Flow: Mlb/hr	80.56
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00005		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.410	17	13	30	1.659	0.850	17	13	8.99	0.817	30.0	12	12.10	0.858	6.4	17
1.405	17	15	34	1.680	0.839	17	15	8.78	0.802	30.4	12	12.03	0.853	6.8	17
1.403	12	15	32	1.703	0.828	17	13	8.67	0.792	30.4	12	11.83	0.839	6.6	17
1.384	17	17	32	1.729	0.815	12	15	8.57	0.789	31.3	12	11.66	0.827	6.8	17
1.383	12	13	28	1.743	0.809	12	47	8.53	0.778	30.4	12	11.63	0.825	6.9	17
1.370	12	15	36	1.755	0.803	12	49	8.27	0.759	31.0	12	9.74	0.821	32.5	12
1.368	17	13	26	1.756	0.803	17	9	9.62	0.751	4.9	17	9.26	0.814	36.8	12
1.366	16	11	28	1.774	0.795	17	15	9.56	0.747	5.3	17	11.45	0.812	6.8	17
1.360	12	11	30	1.779	0.793	16	11	7.93	0.746	33.6	14	11.39	0.808	6.6	16
1.358	12	17	34	1.783	0.791	17	17	8.04	0.746	32.2	12	9.18	0.807	36.6	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.9 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 2,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: Mwd/MTU										20206.3					
Exposure: Mwd/MTU (Gwd)	3000.0 (408.61)																
Delta E: Mwd/MTU, (Gwd)	500.0 (68.10)																
Power: MWt	3458.0 (100.00 %)																
Core Pressure: psia	1050.1																
Inlet Subcooling: Btu/lbm	-27.72																
Flow: Mlb/hr	94.48 (92.18 %)																
		Axial Profile										Edit		Radial Power			
		N(PRA)		Power		Exposure		Zone		Avg.		Max.		IR		JR	
		Top		25		0.157		3.524		10		0.529		1.016		13 46	
				24		0.471		10.555		11		0.579		1.072		11 22	
				23		0.628		14.380		12		1.174		1.400		15 32	
				22		0.740		17.170		13		1.012		1.290		11 26	
				21		0.790		19.030		14		0.973		1.310		13 38	
				20		0.831		20.261		15		1.086		1.235		7 28	
				19		0.862		21.305		16		1.210		1.374		11 28	
				18		0.891		21.863		17		1.205		1.421		13 30	
				17		0.903		21.660									
				16		0.961		21.823									
				15		0.996		22.214									
				14		1.019		22.447									
				13		1.108		22.150									
				12		1.164		22.719									
				11		1.215		23.125									
				10		1.270		23.412									
				9		1.341		24.139									
				8		1.400		24.449									
				7		1.444		24.467									
				6		1.500*		25.181									
				5		1.495		25.308*									
				4		1.391		24.374									
				3		1.228		22.585									
				2		0.938		17.411									
				Bottom		1		0.259									
								% AXIAL TILT									
								-22.586									
								-9.508									
								AVG BOT 8ft/12ft									
								1.1308									
								1.0558									

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.421	17	13	30	1.662	0.848	17	13	8.94	0.821	31.1	12	45	12.09	0.858	7.9
1.416	17	15	34	1.683	0.838	17	15	8.75	0.806	31.5	12	47	12.03	0.853	8.2
1.400	12	15	32	1.706	0.827	17	13	8.64	0.797	31.5	12	45	11.82	0.839	8.0
1.393	17	17	32	1.734	0.813	12	15	8.52	0.792	32.4	12	49	11.62	0.824	8.3
1.382	12	13	28	1.751	0.805	12	47	8.46	0.780	31.5	12	43	11.61	0.824	8.2
1.379	17	13	26	1.764	0.799	17	9	8.24	0.763	32.1	12	17	9.64	0.822	33.7
1.374	16	11	28	1.765	0.799	12	49	9.70	0.758	6.0	17	47	9.26	0.819	37.4
1.369	12	15	36	1.775	0.794	17	15	9.65	0.754	6.5	17	45	11.47	0.814	8.2
1.367	17	17	36	1.780	0.792	12	15	7.92	0.751	34.6	14	47	9.13	0.811	37.8
1.365	17	15	38	1.784	0.790	16	11	8.02	0.751	33.2	12	45	11.41	0.809	8.0

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.10 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 3,000.0 Mwd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: Mwd/MTU	20245.3
Exposure: Mwd/MTU (Gwd)	3039.0 (413.92)		
Delta E: Mwd/MTU, (Gwd)	39.0 (5.32)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.73		
Flow: Mlb/hr	94.43 (92.12 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.157 3.531 10 0.529 1.016 13 46
		24	0.472 10.574 11 0.579 1.072 11 22
		23	0.629 14.406 12 1.174 1.400 15 32
		22	0.741 17.201 13 1.011 1.290 11 26
		21	0.790 19.063 14 0.972 1.310 13 38
		20	0.831 20.295 15 1.086 1.235 7 28
		19	0.863 21.341 16 1.211 1.374 11 28
		18	0.891 21.900 17 1.206 1.422 13 30
		17	0.903 21.698
		16	0.961 21.860
		15	0.995 22.253
		14	1.018 22.487
		13	1.108 22.192
		12	1.163 22.763
		11	1.214 23.170
		10	1.270 23.459
		9	1.340 24.189
		8	1.399 24.501
		7	1.443 24.521
		6	1.500* 25.237
		5	1.495 25.364*
		4	1.391 24.426
		3	1.229 22.630
		2	0.938 17.446
		Bottom 1	0.259 5.036
			% AXIAL TILT -22.557 -9.524
			AVG BOT 8ft/12ft 1.1305 1.0559
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.32		
k-effective:	0.99936		
Void Fraction:	0.441		
Core Delta-P: psia	21.392		
Core Plate Delta-P: psia	16.838		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	83.34	Active Channel Flow: Mlb/hr	80.51
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR						
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR	K	Value	Margin	Exp. FT	IR JR	K	
1.422	17	13 30	1.662	0.848	17	13 30	8.94	0.822	31.2	12	45 30	5	12.09	0.858	8.0	17	47 32 5
1.417	17	15 34	1.683	0.838	17	15 28	8.75	0.807	31.6	12	47 34	5	12.03	0.853	8.3	17	15 34 5
1.400	12	15 32	1.706	0.827	17	13 26	8.64	0.797	31.6	12	45 26	5	11.83	0.839	8.1	17	17 32 5
1.394	17	17 32	1.734	0.813	12	15 32	8.52	0.793	32.5	12	49 32	5	11.62	0.824	8.4	17	17 26 5
1.381	12	13 28	1.752	0.805	12	47 34	8.46	0.780	31.5	12	43 28	5	11.61	0.824	8.3	17	47 36 5
1.380	17	13 26	1.764	0.799	17	9 30	8.24	0.764	32.1	12	17 24	5	9.63	0.822	33.8	12	45 32 5
1.374	16	11 28	1.766	0.799	12	49 32	9.71	0.759	6.1	17	47 32	5	9.26	0.820	37.5	12	47 34 5
1.369	12	15 36	1.775	0.794	17	15 38	9.66	0.754	6.6	17	45 28	5	11.48	0.814	8.3	17	15 24 5
1.368	17	17 36	1.779	0.792	12	15 26	7.92	0.752	34.7	14	47 24	5	9.13	0.811	37.9	12	49 32 5
1.366	17	15 38	1.785	0.790	16	11 28	8.02	0.752	33.3	12	45 22	5	11.41	0.809	8.1	16	49 34 5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.11 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 3,039.0 Mwd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	20246.9
Exposure: MWd/MTU (Gwd)	3040.3 (414.10)		
Delta E: MWd/MTU, (Gwd)	1.3 (0.18)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.74		
Flow: Mlb/hr	94.41 (92.11 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure Zone Avg. Max. IR JR	
		Top 25 0.158 3.531 10 0.532 1.027 45 14	
		24 0.474 10.575 11 0.579 1.054 39 12	
		23 0.632 14.407 12 1.172 1.314 21 42	
		22 0.744 17.202 13 0.990 1.241 17 46	
		21 0.794 19.064 14 0.972 1.258 13 38	
		20 0.835 20.297 15 1.086 1.207 27 54	
		19 0.867 21.342 16 1.216 1.310 19 46	
		18 0.895 21.901 17 1.214 1.340 19 42	
		17 0.906 21.699	
		16 0.963 21.862	
		15 0.995 22.254	
		14 1.017 22.488	
		13 1.105 22.193	
		12 1.160 22.764	
		11 1.210 23.172	
		10 1.266 23.461	
		9 1.337 24.191	
		8 1.397 24.503	
		7 1.442 24.523	
		6 1.500* 25.239	
		5 1.496 25.366*	
		4 1.391 24.428	
		3 1.226 22.632	
		2 0.933 17.447	
		Bottom 1 0.258 5.036	
		% AXIAL TILT -22.321 -9.525	
		AVG BOT 8ft/12ft 1.1288 1.0559	
Control Rod Density: %	4.32		
k-effective:	0.99936		
Void Fraction:	0.441		
Core Delta-P: psia	21.402		
Core Plate Delta-P: psia	16.847		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	83.32	Active Channel Flow: Mlb/hr	80.49
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00005		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.340	17	19	42	1.810	0.779	17	19	8.24	0.757	31.1	12	19	11.24	0.797	6.2
1.322	17	13	32	1.825	0.773	17	17	8.18	0.756	31.7	12	17	11.17	0.792	7.1
1.321	17	21	44	1.851	0.762	12	39	8.29	0.746	28.8	12	21	11.05	0.783	8.0
1.319	17	17	40	1.872	0.753	12	17	8.05	0.740	31.2	12	19	10.98	0.779	7.7
1.317	17	29	48	1.872	0.753	17	21	8.01	0.736	31.1	12	31	10.86	0.770	7.5
1.316	17	17	44	1.874	0.753	12	41	7.91	0.735	32.5	12	49	10.86	0.770	8.0
1.314	12	21	42	1.876	0.752	12	31	7.78	0.729	33.3	12	45	10.80	0.766	7.1
1.310	16	19	46	1.878	0.751	17	29	7.85	0.728	32.2	12	21	10.80	0.766	7.2
1.310	16	11	28	1.883	0.749	17	9	7.88	0.727	31.7	12	47	10.78	0.765	4.1
1.310	12	19	44	1.883	0.749	12	41	7.78	0.720	31.9	12	27	10.77	0.764	7.8

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.12 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 3,040.3 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	20706.3
Exposure: MWd/MTU (Gwd)	3500.0 (476.71)		
Delta E: MWd/MTU, (Gwd)	459.7 (62.61)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.74		
Flow: Mlb/hr	94.42 (92.12 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.161 3.613 10 0.528 1.028 45 14
		24	0.484 10.808 11 0.574 1.055 11 22
		23	0.643 14.718 12 1.170 1.313 21 42
		22	0.755 17.567 13 0.986 1.241 17 46
		21	0.802 19.454 14 0.965 1.260 13 38
		20	0.840 20.706 15 1.089 1.207 7 28
		19	0.870 21.766 16 1.223 1.319 15 42
		18	0.896 22.339 17 1.223 1.350 19 42
		17	0.906 22.142
		16	0.962 22.305
		15	0.993 22.712
		14	1.013 22.956
		13	1.100 22.676
		12	1.154 23.271
		11	1.204 23.700
		10	1.260 24.014
		9	1.331 24.775
		8	1.391 25.114
		7	1.438 25.154
		6	1.497* 25.895
		5	1.494 26.021*
		4	1.391 25.038
		3	1.226 23.169
		2	0.933 17.856
		Bottom 1	0.258 5.157
		% AXIAL TILT -21.970 -9.707	
		AVG BOT 8ft/12ft 1.1259 1.0567	
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		Active Channel Flow: Mlb/hr 80.50	
		(of total core flow)	
		(of total core flow)	
Control Rod Density: %	4.32		
k-effective:	0.99931		
Void Fraction:	0.440		
Core Delta-P: psia	21.407		
Core Plate Delta-P: psia	16.853		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	83.33		
Total Bypass Flow (%):	11.7		
Total Water Rod Flow (%):	3.0		
Source Convergence	0.00005		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR				APLHGR					LHGR										
Value	FT	IR	JR	Value	Margin	FT	IR	JR	Value	Margin	Exp.	FT	IR	JR	K	Value	Margin	Exp.	FT	IR	JR	K
1.350	17	19	42	1.813	0.778	17	19	20	8.18	0.762	32.7	12	17	20	5	11.26	0.798	7.4	17	39	18	5
1.333	17	13	32	1.827	0.772	17	17	44	8.22	0.762	32.0	12	19	18	5	11.19	0.794	9.0	17	41	42	5
1.331	17	17	40	1.848	0.763	12	39	42	8.25	0.749	29.8	12	21	20	5	11.09	0.787	9.2	17	17	40	5
1.330	17	21	44	1.867	0.755	12	17	42	8.05	0.746	32.2	12	19	22	5	11.02	0.781	9.1	17	17	18	5
1.327	17	17	44	1.871	0.754	12	41	18	7.90	0.741	33.4	12	49	30	5	10.92	0.775	9.2	17	47	32	5
1.325	17	29	48	1.877	0.751	12	31	50	7.97	0.738	32.0	12	31	12	5	10.88	0.772	8.7	16	41	16	5
1.319	16	15	42	1.878	0.751	12	41	40	7.79	0.736	34.2	12	45	22	5	8.66	0.767	37.4	12	41	18	5
1.318	16	11	28	1.888	0.747	12	13	34	7.89	0.734	32.6	12	47	28	5	10.81	0.767	9.0	16	15	42	5
1.318	16	19	46	1.890	0.746	17	29	10	7.83	0.732	33.1	12	21	16	5	10.80	0.766	8.3	17	31	14	5
1.313	12	21	42	1.890	0.746	17	9	30	7.75	0.723	32.8	12	27	14	5	10.80	0.766	8.4	17	21	22	5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.13 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 3,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: Mwd/MTU	21206.3
Exposure: Mwd/MTU (GWd)	4000.0 (544.81)		
Delta E: Mwd/MTU, (GWd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.87		
Flow: Mlb/hr	94.00 (91.70 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.165 3.704 10 0.522 1.030 45 14
		24	0.492 11.066 11 0.568 1.056 11 22
		23	0.652 15.060 12 1.168 1.313 21 42
		22	0.764 17.970 13 0.982 1.242 17 46
		21	0.807 19.881 14 0.957 1.260 13 38
		20	0.843 21.153 15 1.091 1.207 7 28
		19	0.870 22.229 16 1.230 1.330 15 42
		18	0.894 22.815 17 1.233 1.364 19 42
		17	0.902 22.622
		16	0.958 22.786
		15	0.987 23.208
		14	1.006 23.461
		13	1.091 23.198
		12	1.145 23.818
		11	1.195 24.271
		10	1.251 24.612
		9	1.323 25.407
		8	1.385 25.776
		7	1.435 25.839
		6	1.497 26.609
		5	1.499* 26.734*
		4	1.400 25.703
		3	1.236 23.755
		2	0.940 18.302
		Bottom 1	0.262 5.289
			% AXIAL TILT -21.859 -9.891
			AVG BOT 8ft/12ft 1.1240 1.0576
Control Rod Density: %	4.32		
k-effective:	0.99921		
Void Fraction:	0.440		
Core Delta-P: psia	21.266		
Core Plate Delta-P: psia	16.712		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	82.96	Active Channel Flow: Mlb/hr	80.14
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR				APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR	K	Value	Margin	Exp. FT	IR JR	K
1.364	17	19 42	1.810	0.779	17	19 20	8.21	0.772	33.7 12	17 20	5	11.34	0.804	8.8 17	39 18	5
1.344	17	17 40	1.825	0.773	17	17 44	8.25	0.771	33.1 12	19 18	5	11.28	0.800	10.3 17	41 42	5
1.343	17	13 32	1.840	0.766	12	39 42	8.26	0.757	30.9 12	21 20	5	11.19	0.794	10.5 17	17 40	5
1.342	17	21 44	1.858	0.759	12	17 42	8.07	0.756	33.2 12	19 22	5	11.12	0.788	10.4 17	17 18	5
1.340	17	17 44	1.862	0.757	12	41 18	7.90	0.748	34.4 12	49 32	5	10.99	0.780	10.6 17	47 32	5
1.334	17	29 48	1.869	0.754	12	41 40	7.82	0.746	35.2 12	45 22	5	10.96	0.778	10.0 16	41 16	5
1.330	16	15 42	1.874	0.752	12	31 50	7.96	0.744	33.0 12	31 12	5	8.67	0.776	38.5 12	41 18	5
1.329	16	19 46	1.884	0.748	12	47 34	7.90	0.742	33.6 12	47 28	5	10.90	0.773	10.3 16	15 42	5
1.326	16	11 28	1.890	0.746	16	15 20	7.85	0.741	34.1 12	21 16	5	8.65	0.772	38.2 12	39 42	5
1.324	17	21 40	1.891	0.745	16	19 16	7.66	0.732	35.4 13	45 18	5	10.88	0.771	9.6 17	39 40	5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.14 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 4,000.0 Mwd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	21706.3
Exposure: MWd/MTU (Gwd)	4500.0 (612.91)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.16		
Flow: Mlb/hr	93.08 (90.81 %)		
		Axial Profile	Edit Radial Power
		N(PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.168 3.796 10 0.517 1.031 45 14
		24	0.499 11.328 11 0.562 1.057 11 40
		23	0.660 15.408 12 1.166 1.313 21 42
		22	0.770 18.377 13 0.978 1.243 17 46
		21	0.810 20.311 14 0.949 1.260 13 38
		20	0.843 21.602 15 1.094 1.207 7 28
		19	0.868 22.691 16 1.238 1.341 15 42
		18	0.890 23.289 17 1.242 1.378 19 42
		17	0.897 23.101
		16	0.951 23.264
		15	0.979 23.701
		14	0.996 23.963
		13	1.080 23.715
		12	1.133 24.361
		11	1.183 24.838
		10	1.241 25.206
		9	1.314 26.036
		8	1.380 26.435
		7	1.434 26.523
		6	1.501 27.324
		5	1.509* 27.451*
		4	1.417 26.375
		3	1.255 24.348
		2	0.955 18.753
		Bottom 1	0.267 5.423
			% AXIAL TILT -21.984 -10.066
			AVG BOT 8ft/12ft 1.1233 1.0583
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.32		
k-effective:	0.99906		
Void Fraction:	0.441		
Core Delta-P: psia	20.971		
Core Plate Delta-P: psia	16.417		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	82.13	Active Channel Flow: Mlb/hr	79.33
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.378	17	19	42	1.803	0.782	17	19	8.25	0.784	34.7	12	17	11.46	0.812	10.1
1.358	17	17	40	1.819	0.775	17	17	8.29	0.783	34.1	12	19	11.41	0.809	11.7
1.354	17	13	32	1.829	0.771	12	39	8.12	0.767	34.2	12	19	11.33	0.803	11.9
1.354	17	21	44	1.846	0.764	12	17	8.29	0.767	31.9	12	21	11.25	0.798	11.8
1.354	17	17	44	1.849	0.762	12	41	7.87	0.758	36.2	12	45	8.71	0.788	39.6
1.345	17	29	48	1.856	0.760	12	41	7.91	0.756	35.4	12	49	11.10	0.787	11.9
1.341	16	15	42	1.868	0.755	12	31	7.89	0.752	35.1	12	21	11.08	0.786	11.3
1.340	16	19	46	1.876	0.752	12	47	7.93	0.752	34.6	12	47	8.55	0.783	40.8
1.336	17	21	40	1.884	0.748	12	15	7.97	0.752	34.0	12	31	8.63	0.783	39.9
1.334	16	11	28	1.886	0.748	16	15	7.71	0.744	36.3	13	45	8.67	0.782	39.3

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.15 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 4,500.0 MWd/MTU

Cycle:	19	Core Average Exposure: MWd/MTU	22206.3
Exposure: MWd/MTU (Gwd)	5000.0 (681.01)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.54		
Flow: Mlb/hr	91.89 (89.65 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.170 3.890 10 0.512 1.032 45 14
		24	0.504 11.594 11 0.557 1.058 11 40
		23	0.665 15.759 12 1.164 1.314 21 42
		22	0.775 18.787 13 0.974 1.244 17 46
		21	0.811 20.742 14 0.940 1.260 13 38
		20	0.841 22.049 15 1.096 1.207 7 28
		19	0.863 23.151 16 1.246 1.353 15 42
		18	0.884 23.761 17 1.253 1.392 19 42
		17	0.889 23.575
		16	0.941 23.738
		15	0.968 24.189
		14	0.985 24.460
		13	1.068 24.227
		12	1.120 24.897
		11	1.171 25.398
		10	1.230 25.794
		9	1.306 26.660
		8	1.375 27.092
		7	1.434 27.206
		6	1.508 28.041
		5	1.524* 28.175*
		4	1.441 27.057
		3	1.281 24.951
		2	0.976 19.213
		Bottom 1	0.273 5.561
			% AXIAL TILT -22.312 -10.239
			AVG BOT 8ft/12ft 1.1236 1.0590
Control Rod Density: %	4.32		
k-effective:	0.99897		
Void Fraction:	0.443		
Core Delta-P: psia	20.602		
Core Plate Delta-P: psia	16.048		
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	81.06	Active Channel Flow: Mlb/hr	78.29
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.392	17	19	42	1.793	0.786	17	19	8.32	0.799	35.8	12	11.60	0.822	11.5	17
1.372	17	17	40	1.809	0.779	17	17	8.35	0.797	35.1	12	11.57	0.820	13.1	17
1.368	17	17	44	1.815	0.777	12	39	8.18	0.781	35.2	12	11.49	0.815	13.3	17
1.367	17	21	44	1.831	0.770	12	17	8.35	0.780	32.9	12	11.40	0.809	13.1	17
1.366	17	13	32	1.835	0.768	12	41	7.94	0.772	37.2	12	8.75	0.801	40.7	12
1.355	17	29	48	1.842	0.766	12	41	7.94	0.767	36.4	12	8.61	0.797	41.8	12
1.353	16	15	42	1.860	0.758	12	31	7.95	0.765	36.1	12	8.68	0.797	41.0	12
1.351	16	19	46	1.866	0.755	12	47	7.98	0.764	35.6	12	11.22	0.796	13.2	17
1.350	17	21	40	1.874	0.753	12	15	8.00	0.762	35.0	12	11.22	0.796	12.7	16
1.343	17	13	36	1.876	0.752	17	17	9.71	0.758	10.2	17	8.71	0.794	40.4	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.16 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 5,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	22440.2
Exposure: MWd/MTU (GWd)	5233.9 (712.87)		
Delta E: MWd/MTU, (GWd)	233.9 (31.85)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.77		
Flow: Mlb/hr	91.18 (88.96 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.171 3.934 10 0.510 1.032 45 14
		24	0.506 11.719 11 0.554 1.058 11 40
		23	0.667 15.924 12 1.163 1.314 21 42
		22	0.775 18.980 13 0.972 1.244 17 46
		21	0.810 20.944 14 0.936 1.259 13 38
		20	0.839 22.258 15 1.097 1.207 7 28
		19	0.860 23.365 16 1.250 1.358 15 42
		18	0.880 23.980 17 1.258 1.399 19 42
		17	0.884 23.796
		16	0.936 23.958
		15	0.962 24.415
		14	0.979 24.690
		13	1.061 24.464
		12	1.113 25.146
		11	1.164 25.658
		10	1.224 26.068
		9	1.301 26.950
		8	1.372 27.398
		7	1.434 27.526
		6	1.512 28.377
		5	1.533* 28.516*
		4	1.455 27.380
		3	1.297 25.239
		2	0.989 19.431
		Bottom 1	0.277 5.626
			% AXIAL TILT -22.563 -10.321
			AVG BOT 8ft/12ft 1.1242 1.0593
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	4.32		
k-effective:	0.99890		
Void Fraction:	0.445		
Core Delta-P: psia	20.382		
Core Plate Delta-P: psia	15.828		
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	80.41	Active Channel Flow: Mlb/hr	77.66
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.399	17	19	42	1.787	0.789	17	19	8.36	0.806	36.3	12	17	11.68	0.828	12.2
1.379	17	17	40	1.803	0.782	17	17	8.39	0.804	35.6	12	19	11.65	0.826	13.7
1.375	17	17	44	1.807	0.780	12	39	8.22	0.788	35.7	12	19	11.57	0.820	13.9
1.373	17	21	44	1.823	0.773	12	17	8.38	0.787	33.4	12	21	11.49	0.815	13.8
1.371	17	13	32	1.828	0.772	12	41	7.97	0.779	37.6	12	45	8.78	0.808	41.2
1.361	17	29	48	1.834	0.769	12	41	7.99	0.772	36.6	12	21	8.65	0.805	42.3
1.358	16	15	42	1.855	0.760	12	31	7.96	0.772	36.9	12	49	8.72	0.804	41.5
1.357	16	19	46	1.861	0.758	12	47	8.01	0.771	36.0	12	47	11.30	0.801	13.3
1.356	17	21	40	1.862	0.757	17	17	9.82	0.768	10.8	17	19	8.79	0.801	40.3
1.349	17	13	36	1.867	0.755	17	21	8.01	0.767	35.5	12	31	11.29	0.801	13.9

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.17 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 5,233.9 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	22441.5
Exposure: MWd/MTU (Gwd)	5234.9 (713.00)		
Delta E: MWd/MTU, (Gwd)	1.0 (0.13)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.36		
Flow: Mlb/hr	99.09 (96.68 %)		
		Axial Profile	Edit Radial Power
		N(PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.185 3.935 10 0.522 1.168 31 30
		24	0.549 11.719 11 0.555 1.057 11 22
		23	0.724 15.924 12 1.172 1.340 27 32
		22	0.841 18.980 13 0.990 1.251 11 26
		21	0.876 20.945 14 0.935 1.252 13 24
		20	0.902 22.259 15 1.096 1.231 7 28
		19	0.918 23.366 16 1.218 1.369 11 28
		18	0.931 23.981 17 1.244 1.409 25 32
		17	0.925 23.797
		16	0.965 23.959
		15	0.982 24.416
		14	0.989 24.691
		13	1.064 24.465
		12	1.110 25.147
		11	1.154 25.659
		10	1.208 26.069
		9	1.279 26.952
		8	1.343 27.399
		7	1.395 27.527
		6	1.461 28.379
		5	1.465* 28.517*
		4	1.369 27.381
		3	1.203 25.240
		2	0.909 19.432
		Bottom 1	0.254 5.627
			% AXIAL TILT -18.221 -10.321
			AVG BOT 8ft/12ft 1.0970 1.0593
Control Rod Density: %	5.05		
k-effective:	0.99890		
Void Fraction:	0.423		
Core Delta-P: psia	22.870		
Core Plate Delta-P: psia	18.312		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	87.61	Active Channel Flow: Mlb/hr	84.69
Total Bypass Flow (%):	11.6	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00006		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.409	17	25	32	1.835	0.768	12	23	8.37	0.778	32.5	12	11.51	0.817	11.4	17
1.392	17	13	30	1.836	0.768	12	33	7.97	0.773	36.9	12	11.30	0.801	13.9	17
1.380	17	23	34	1.842	0.766	12	25	8.02	0.772	36.0	12	11.24	0.797	9.8	17
1.375	17	27	28	1.855	0.760	12	31	8.31	0.769	31.9	12	11.21	0.795	11.0	17
1.369	16	11	28	1.886	0.748	12	13	8.24	0.758	31.4	12	8.87	0.791	38.2	12
1.363	17	13	26	1.890	0.746	17	25	9.47	0.740	8.9	17	8.44	0.787	42.4	12
1.357	17	15	28	1.903	0.741	12	49	8.09	0.737	30.2	12	8.40	0.780	42.0	12
1.340	12	27	32	1.904	0.740	17	13	7.66	0.735	35.8	12	10.99	0.779	14.0	17
1.336	12	23	32	1.910	0.738	12	39	9.41	0.735	10.9	17	8.76	0.778	37.8	12
1.332	17	29	26	1.911	0.738	12	23	7.66	0.734	35.6	12	10.93	0.776	13.9	17

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.18 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 5,234.9 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	22706.3
Exposure: MWd/MTU (GWd)	5500.0 (749.11)		
Delta E: MWd/MTU, (GWd)	265.1 (36.11)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.64		
Flow: Mlb/hr	98.11 (95.72 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.187 3.989 10 0.519 1.158 31 30
		24	0.552 11.874 11 0.552 1.058 11 22
		23	0.728 16.128 12 1.171 1.331 23 32
		22	0.844 19.218 13 0.988 1.250 11 26
		21	0.877 21.192 14 0.931 1.252 13 24
		20	0.901 22.513 15 1.097 1.231 7 28
		19	0.916 23.625 16 1.223 1.373 11 28
		18	0.928 24.243 17 1.250 1.410 25 32
		17	0.921 24.057
		16	0.960 24.215
		15	0.976 24.676
		14	0.983 24.952
		13	1.057 24.733
		12	1.102 25.426
		11	1.147 25.950
		10	1.201 26.373
		9	1.274 27.274
		8	1.340 27.738
		7	1.395 27.880
		6	1.464 28.749
		5	1.473* 28.888*
		4	1.381 27.729
		3	1.216 25.545
		2	0.919 19.663
		Bottom 1	0.257 5.696
			% AXIAL TILT -18.355 -10.362
			AVG BOT 8ft/12ft 1.0968 1.0594
Control Rod Density: %	5.05		
k-effective:	0.99889		
Void Fraction:	0.425		
Core Delta-P: psia	22.544		
Core Plate Delta-P: psia	17.986		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	86.72	Active Channel Flow: Mlb/hr	83.83
Total Bypass Flow (%):	11.6	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.410	17	25	32	1.831	0.770	12	23	8.33	0.779	33.1	12	37	11.49	0.815	12.1
1.398	17	13	30	1.838	0.767	12	25	7.99	0.779	37.4	12	49	11.37	0.806	14.6
1.383	17	23	34	1.839	0.767	12	33	8.05	0.778	36.6	12	47	11.21	0.795	11.7
1.375	17	27	28	1.858	0.759	12	31	8.27	0.769	32.5	12	35	11.19	0.794	10.5
1.373	16	11	28	1.878	0.751	12	13	8.16	0.755	31.9	12	33	8.46	0.793	43.0
1.370	17	13	26	1.891	0.746	17	13	9.52	0.743	11.5	17	47	8.82	0.792	38.8
1.364	17	15	28	1.892	0.745	17	25	7.71	0.743	36.2	12	19	8.42	0.786	42.5
1.335	17	21	44	1.896	0.744	12	49	7.69	0.742	36.3	12	45	11.06	0.784	14.7
1.334	17	21	30	1.904	0.740	12	15	9.49	0.742	9.5	17	35	11.00	0.780	14.6
1.333	17	29	26	1.905	0.740	12	23	7.48	0.735	38.3	13	49	10.97	0.778	14.5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.19 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 5,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	23706.3
Exposure: MWd/MTU (Gwd)	6500.0 (885.32)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.70		
Flow: Mlb/hr	94.54 (92.23 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.192 4.200 10 0.509 1.136 31 30
		24	0.563 12.465 11 0.541 1.060 11 22
		23	0.739 16.905 12 1.165 1.324 23 30
		22	0.853 20.118 13 0.979 1.247 11 26
		21	0.877 22.125 14 0.914 1.252 13 24
		20	0.894 23.468 15 1.103 1.232 7 28
		19	0.904 24.593 16 1.240 1.392 11 28
		18	0.911 25.221 17 1.271 1.428 25 32
		17	0.900 25.026
		16	0.935 25.164
		15	0.947 25.639
		14	0.952 25.922
		13	1.022 25.723
		12	1.067 26.460
		11	1.113 27.027
		10	1.172 27.504
		9	1.250 28.477
		8	1.326 29.009
		7	1.396 29.210
		6	1.483 30.154
		5	1.516* 30.313*
		4	1.448 29.077
		3	1.290 26.737
		2	0.978 20.565
		Bottom 1	0.274 5.966
			% AXIAL TILT -19.380 -10.532
			AVG BOT 8ft/12ft 1.0985 1.0596
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	5.05		
k-effective:	0.99867		
Void Fraction:	0.433		
Core Delta-P: psia	21.395		
Core Plate Delta-P: psia	16.838		
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	83.48	Active Channel Flow: Mlb/hr	80.66
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.428	17	25	32	1.806	0.781	12	23	8.16	0.805	38.6	12	47	11.75	0.834	17.0
1.423	17	13	30	1.813	0.778	12	25	8.09	0.805	39.4	12	49	11.67	0.828	14.1
1.403	17	23	28	1.829	0.771	12	33	8.38	0.799	35.2	12	37	8.54	0.819	45.1
1.396	17	13	26	1.839	0.767	17	13	8.29	0.786	34.6	12	35	8.50	0.812	44.6
1.392	16	11	28	1.847	0.763	17	25	9.93	0.776	13.8	17	47	8.84	0.811	41.0
1.388	17	15	28	1.849	0.763	12	31	7.88	0.773	38.1	12	19	11.41	0.809	14.4
1.386	17	27	28	1.850	0.762	12	13	7.82	0.768	38.3	12	45	11.33	0.804	16.8
1.363	17	21	44	1.865	0.756	17	23	9.81	0.766	11.8	17	35	11.32	0.803	16.8
1.356	17	17	44	1.871	0.753	12	49	7.63	0.765	40.3	13	49	11.28	0.800	13.2
1.353	17	21	30	1.873	0.753	17	13	8.08	0.762	34.0	12	33	11.23	0.796	16.7

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.21 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 6,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	24206.3
Exposure: MWd/MTU (Gwd)	7000.0 (953.42)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.38		
Flow: Mlb/hr	92.37 (90.12 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.194 4.307 10 0.504 1.126 31 30
1		24	0.567 12.764 11 0.535 1.061 11 40
3		23	0.743 17.298 12 1.163 1.322 23 30
5		22	0.856 20.572 13 0.974 1.244 11 26
7		21	0.877 22.591 14 0.906 1.250 13 24
9		20	0.891 23.943 15 1.106 1.232 7 28
11		19	0.898 25.072 16 1.248 1.400 11 28
13		18	0.902 25.703 17 1.281 1.439 25 30
15		17	0.890 25.502
17		16	0.922 25.629
19		15	0.933 26.110
21		14	0.937 26.395
23		13	1.005 26.206
25		12	1.049 26.964
27		11	1.097 27.554
29		10	1.157 28.059
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.238 29.070
		8	1.318 29.639
		7	1.394 29.876
		6	1.490 30.863
		5	1.534* 31.040*
		4	1.481 29.776
		3	1.330 27.361
		2	1.010 21.039
		Bottom 1	0.284 6.108
Control Rod Density: %	5.05		
k-effective:	0.99859		
Void Fraction:	0.437		
Core Delta-P: psia	20.711	% AXIAL TILT	-19.895 -10.629
Core Plate Delta-P: psia	16.155	AVG BOT 8ft/12ft	1.0994 1.0597
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	81.53	Active Channel Flow: Mlb/hr	78.76
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR K	Value	Margin	Exp. FT	IR JR K	
1.439	17	25 30	1.788	0.788	12	23 32	8.14	0.811	39.7 12	47 28 5	11.90	0.844	15.5 17	25 32 4	
1.432	17	13 30	1.796	0.785	12	25 34	8.07	0.811	40.5 12	49 32 5	11.87	0.842	18.4 17	47 32 4	
1.415	17	23 28	1.809	0.779	17	13 30	8.40	0.809	36.2 12	37 30 5	8.50	0.825	46.2 12	49 32 5	
1.406	17	13 26	1.813	0.778	17	25 30	8.31	0.796	35.6 12	35 28 5	11.61	0.823	15.0 17	23 34 4	
1.400	16	11 28	1.818	0.775	12	33 32	10.14	0.792	14.3 17	47 32 4	9.00	0.823	40.6 12	23 32 4	
1.397	17	15 28	1.827	0.772	17	23 28	7.92	0.785	39.1 12	19 18 5	8.58	0.817	44.4 12	47 34 4	
1.394	17	27 28	1.834	0.769	12	13 34	9.98	0.780	12.0 17	35 30 4	11.49	0.815	18.2 16	49 34 4	
1.377	17	21 44	1.839	0.767	12	31 34	7.65	0.775	41.2 13	49 26 5	11.45	0.812	18.2 17	47 26 4	
1.369	17	17 44	1.843	0.765	17	13 26	7.81	0.775	39.2 12	45 26 5	11.38	0.807	13.7 17	33 34 4	
1.363	17	21 30	1.849	0.763	17	27 34	9.83	0.768	14.4 17	47 26 4	11.34	0.804	16.7 17	39 18 4	

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.22 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 7,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	24635.0
Exposure: MWd/MTU (Gwd)	7428.7 (1011.80)		
Delta E: MWd/MTU, (Gwd)	428.7 (58.39)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-29.03		
Flow: Mlb/hr	90.41 (88.20 %)		
		Axial Profile	Edit Radial Power
		N(PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.196 4.400 10 0.501 1.119 31 30
		24	0.572 13.023 11 0.531 1.061 11 40
		23	0.749 17.637 12 1.160 1.319 23 30
		22	0.860 20.962 13 0.970 1.241 11 26
		21	0.878 22.991 14 0.899 1.247 13 24
		20	0.890 24.349 15 1.109 1.232 7 28
		19	0.895 25.480 16 1.255 1.404 11 28
		18	0.898 26.114 17 1.289 1.447 25 30
		17	0.885 25.907
		16	0.915 26.024
		15	0.924 26.509
		14	0.927 26.795
		13	0.995 26.614
		12	1.038 27.390
		11	1.086 27.999
		10	1.147 28.530
		9	1.229 29.574
		8	1.311 30.177
		7	1.390 30.445
		6	1.489 31.471
		5	1.541* 31.669*
		4	1.501 30.385
		3	1.359 27.910
		2	1.034 21.456
		Bottom 1	0.291 6.233
			% AXIAL TILT -20.096 -10.715
			AVG BOT 8ft/12ft 1.0992 1.0598
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	5.05		
k-effective:	0.99849		
Void Fraction:	0.441		
Core Delta-P: psia	20.090		
Core Plate Delta-P: psia	15.535		
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	79.76	Active Channel Flow: Mlb/hr	77.04
Total Bypass Flow (%):	11.8	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.447	17	25	30	1.772	0.796	12	23	8.54	0.819	35.7	12	37	12.03	0.853	16.8
1.437	17	13	30	1.778	0.793	17	25	8.15	0.810	39.3	12	47	11.78	0.841	19.6
1.424	17	23	28	1.779	0.793	12	25	7.97	0.808	41.3	12	49	9.03	0.834	41.6
1.412	17	13	26	1.784	0.790	17	13	8.44	0.804	35.0	12	35	11.76	0.834	16.2
1.404	16	11	28	1.790	0.788	17	23	10.19	0.796	13.1	17	35	8.50	0.823	45.9
1.402	17	15	28	1.807	0.780	12	33	10.15	0.795	15.4	17	47	11.49	0.818	19.3
1.401	17	27	28	1.816	0.776	17	27	7.89	0.789	40.0	12	19	8.49	0.817	45.3
1.388	17	21	44	1.816	0.776	17	13	7.60	0.776	42.1	13	49	11.50	0.816	14.9
1.378	17	17	44	1.820	0.775	12	13	9.87	0.774	15.4	17	47	8.85	0.813	41.0
1.371	17	21	30	1.825	0.773	17	21	7.60	0.773	41.7	13	43	11.44	0.812	17.9

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.23 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 7,428.7 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	24636.7
Exposure: MWd/MTU (GWd)	7430.1 (1012.00)		
Delta E: MWd/MTU, (GWd)	1.4 (0.19)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-25.52		
Flow: Mlb/hr	102.18 (99.68 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.211 4.400 10 0.497 1.094 31 30
		24	0.617 13.023 11 0.530 1.004 9 24
		23	0.807 17.638 12 1.176 1.363 15 32
		22	0.921 20.963 13 0.973 1.266 19 34
		21	0.930 22.992 14 0.882 1.003 27 56
		20	0.928 24.350 15 1.114 1.244 7 28
		19	0.914 25.482 16 1.234 1.412 11 28
		18	0.892 26.115 17 1.284 1.496 13 30
		17	0.858 25.908
		16	0.897 26.025
		15	0.912 26.511
		14	0.918 26.796
		13	0.988 26.616
		12	1.035 27.391
		11	1.084 28.001
		10	1.146 28.531
		9	1.230 29.576
		8	1.311 30.178
		7	1.387 30.447
		6	1.480 31.473
		5	1.518* 31.671*
		4	1.458 30.387
		3	1.302 27.912
		2	0.982 21.457
		Bottom 1	0.276 6.233
			% AXIAL TILT -18.333 -10.715
			AVG BOT 8ft/12ft 1.0844 1.0598
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.13		
k-effective:	0.99848		
Void Fraction:	0.417		
Core Delta-P: psia	23.945		
Core Plate Delta-P: psia	19.382		
Coolant Temp: Deg-F	548.1		
In Channel Flow: Mlb/hr	90.40	Active Channel Flow: Mlb/hr	87.41
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR				LHGR			
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR	K	Value	Margin
1.496	17	13 30	1.815	0.777	12	15 32	8.52	0.850	39.8	12	45 32	5	12.17
1.484	17	29 48	1.822	0.774	12	31 16	8.62	0.846	38.0	12	29 16	5	12.09
1.466	17	15 34	1.836	0.768	17	13 30	10.60	0.831	15.4	17	47 32	4	12.14
1.462	17	17 32	1.853	0.761	17	29 48	8.11	0.822	41.3	12	49 32	5	12.13
1.452	17	29 18	1.855	0.760	17	17 30	8.25	0.819	39.2	12	31 12	5	12.04
1.450	17	27 46	1.869	0.755	17	31 44	8.15	0.819	40.5	12	47 34	5	12.03
1.412	16	11 28	1.877	0.751	12	31 50	10.44	0.816	14.3	17	29 14	5	8.69
1.402	16	27 50	1.884	0.748	12	17 34	8.22	0.813	38.9	12	27 14	5	8.75
1.389	17	17 36	1.886	0.748	17	15 28	10.22	0.800	15.2	17	45 34	4	8.63
1.379	17	25 44	1.891	0.746	12	27 44	8.04	0.793	38.5	12	43 28	5	8.90

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.24 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 7,430.1 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	24706.3
Exposure: MWd/MTU (GWd)	7500.0 (1021.50)		
Delta E: MWd/MTU, (GWd)	69.9 (9.52)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-25.71		
Flow: Mlb/hr	101.48 (99.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.211 4.417 10 0.496 1.093 31 30
		24	0.618 13.069 11 0.529 1.004 9 24
		23	0.808 17.697 12 1.176 1.362 15 32
		22	0.922 21.032 13 0.972 1.265 19 34
		21	0.931 23.061 14 0.881 1.001 27 56
		20	0.928 24.419 15 1.115 1.244 7 28
		19	0.914 25.550 16 1.235 1.413 11 28
		18	0.891 26.181 17 1.286 1.497 13 30
		17	0.857 25.972
		16	0.896 26.088
		15	0.911 26.574
		14	0.916 26.860
		13	0.986 26.681
		12	1.033 27.460
		11	1.082 28.073
		10	1.145 28.608
		9	1.228 29.658
		8	1.310 30.266
		7	1.386 30.539
		6	1.479 31.572
		5	1.518* 31.772*
		4	1.461 30.485
		3	1.306 27.999
		2	0.986 21.523
		Bottom 1	0.277 6.253
			% AXIAL TILT -18.355 -10.724
			AVG BOT 8ft/12ft 1.0843 1.0598
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.13		
k-effective:	0.99845		
Void Fraction:	0.418		
Core Delta-P: psia	23.703		
Core Plate Delta-P: psia	19.140		
Coolant Temp: Deg-F	548.1		
In Channel Flow: Mlb/hr	89.76	Active Channel Flow: Mlb/hr	86.80
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.497	17	13	30	1.810	0.779	12	15	8.60	0.849	38.6	12	45	12.21	0.866	16.4
1.486	17	29	48	1.816	0.776	12	31	8.63	0.847	38.2	12	29	12.17	0.863	16.0
1.467	17	15	34	1.829	0.771	17	13	10.58	0.830	15.5	17	47	12.05	0.862	19.8
1.463	17	17	32	1.846	0.764	17	17	8.09	0.821	41.5	12	49	12.13	0.860	17.9
1.453	17	29	18	1.846	0.764	17	29	8.25	0.820	39.4	12	31	12.07	0.856	16.6
1.452	17	27	46	1.861	0.758	17	31	10.49	0.819	13.5	17	29	12.01	0.855	19.3
1.413	16	11	28	1.872	0.753	12	31	8.12	0.817	40.6	12	47	8.90	0.846	44.3
1.404	16	27	50	1.879	0.751	12	17	8.23	0.814	39.0	12	27	8.65	0.845	46.7
1.390	17	17	36	1.879	0.750	17	15	10.21	0.800	15.4	17	45	8.73	0.845	46.0
1.381	17	25	44	1.885	0.748	12	27	8.15	0.792	37.1	12	27	8.60	0.844	47.2

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.25 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 7,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	25206.3
Exposure: MWd/MTU (Gwd)	8000.0 (1089.60)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.18		
Flow: Mlb/hr	99.75 (97.31 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.215 4.535 10 0.493 1.086 31 30
		24	0.629 13.399 11 0.525 1.005 9 24
		23	0.821 18.129 12 1.172 1.355 29 46
		22	0.935 21.524 13 0.968 1.258 27 20
		21	0.941 23.559 14 0.875 0.996 15 52
		20	0.935 24.914 15 1.120 1.245 7 28
		19	0.919 26.037 16 1.243 1.415 11 28
		18	0.894 26.656 17 1.294 1.496 13 32
		17	0.858 26.428
		16	0.895 26.536
		15	0.908 27.030
		14	0.912 27.318
		13	0.981 27.150
		12	1.026 27.951
		11	1.075 28.587
		10	1.137 29.151
		9	1.220 30.241
		8	1.301 30.888
		7	1.375 31.197
		6	1.467 32.274
		5	1.508* 32.493*
		4	1.461 31.181
		3	1.315 28.623
		2	0.994 21.994
		Bottom 1	0.279 6.394
			% AXIAL TILT -17.890 -10.783
			AVG BOT 8ft/12ft 1.0805 1.0596
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.13		
k-effective:	0.99847		
Void Fraction:	0.420		
Core Delta-P: psia	23.095		
Core Plate Delta-P: psia	18.533		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	88.21	Active Channel Flow: Mlb/hr	85.29
Total Bypass Flow (%):	11.6	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR							LHGR							
Value	FT	IR	JR	Value	Margin	FT	IR	JR	Value	Margin	Exp.	FT	IR	JR	K	Value	Margin	Exp.	FT	IR	JR	K
1.496	17	13	32	1.800	0.783	12	15	32	8.63	0.843	37.7	12	29	16	4	12.16	0.862	17.8	17	33	16	4
1.492	17	29	48	1.804	0.781	12	31	16	8.31	0.829	39.7	12	45	32	4	12.13	0.860	17.5	17	31	18	4
1.467	17	15	34	1.812	0.778	17	13	30	10.53	0.822	14.7	17	29	14	4	11.95	0.847	18.0	17	31	14	4
1.465	17	17	32	1.821	0.774	17	29	48	10.28	0.815	16.8	17	47	32	4	8.93	0.843	43.7	12	31	16	4
1.460	17	29	18	1.823	0.774	17	17	30	8.11	0.814	40.4	12	31	12	5	11.64	0.842	21.3	17	47	32	4
1.460	17	27	46	1.833	0.769	17	31	44	8.10	0.810	40.0	12	27	14	5	11.79	0.839	19.3	17	17	32	4
1.415	16	11	28	1.857	0.759	17	15	28	7.84	0.804	42.5	12	49	32	5	11.63	0.838	20.7	17	15	34	4
1.410	16	27	50	1.860	0.758	12	31	50	7.87	0.800	41.6	12	47	34	5	8.50	0.828	46.6	12	31	50	5
1.396	17	17	36	1.867	0.755	17	27	46	10.08	0.787	13.4	17	27	16	4	8.51	0.827	46.3	12	33	48	5
1.390	17	25	44	1.869	0.754	12	17	34	9.94	0.786	16.6	17	45	34	4	8.43	0.826	47.0	12	15	32	

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.26 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 8,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	25706.3
Exposure: MWd/MTU (GWd)	8500.0 (1157.70)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.61		
Flow: Mlb/hr	98.22 (95.82 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.221 4.656 10 0.490 1.076 31 30
		24	0.644 13.736 11 0.522 1.006 9 24
		23	0.839 18.568 12 1.169 1.351 29 46
		22	0.953 22.025 13 0.965 1.252 27 20
		21	0.957 24.063 14 0.870 0.994 15 52
		20	0.949 25.415 15 1.126 1.245 27 54
		19	0.931 26.528 16 1.251 1.418 27 50
		18	0.904 27.134 17 1.300 1.499 29 48
		17	0.867 26.886
		16	0.901 26.986
		15	0.913 27.486
		14	0.916 27.776
		13	0.983 27.618
		12	1.027 28.440
		11	1.075 29.099
		10	1.135 29.692
		9	1.214 30.821
		8	1.290 31.505
		7	1.358 31.849
		6	1.442 32.968
		5	1.479* 33.205*
		4	1.437 31.872
		3	1.302 29.246
		2	0.987 22.466
		Bottom 1	0.277 6.536
			% AXIAL TILT -16.770 -10.823
			AVG BOT 8ft/12ft 1.0736 1.0593
Control Rod Density: %	6.13		
k-effective:	0.99848		
Void Fraction:	0.419		
Core Delta-P: psia	22.541		
Core Plate Delta-P: psia	17.980		
Coolant Temp: Deg-F	548.0		
In Channel Flow: Mlb/hr	86.85	Active Channel Flow: Mlb/hr	83.97
Total Bypass Flow (%):	11.6	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.499	17	29	48	1.789	0.788	12	15	8.43	0.833	38.7	12	29	11.91	0.848	19.3
1.492	17	13	32	1.790	0.788	12	31	10.38	0.817	16.0	17	29	11.91	0.845	18.9
1.468	17	27	46	1.790	0.788	17	29	7.90	0.802	41.4	12	31	11.65	0.835	20.2
1.466	17	31	18	1.791	0.787	17	13	7.91	0.799	41.0	12	27	8.72	0.833	44.8
1.465	17	15	34	1.801	0.783	17	17	7.83	0.799	42.0	12	45	8.28	0.817	47.6
1.465	17	17	32	1.805	0.781	17	31	10.02	0.783	14.6	17	27	8.30	0.816	47.3
1.418	16	27	50	1.833	0.769	17	27	9.77	0.782	18.0	17	47	11.24	0.809	20.7
1.416	16	11	28	1.834	0.769	17	15	9.94	0.777	14.2	17	29	11.02	0.807	22.6
1.398	17	17	36	1.844	0.764	12	31	7.49	0.776	43.5	12	49	11.04	0.805	22.1
1.398	17	25	44	1.847	0.763	12	13	7.80	0.773	39.1	12	27	8.05	0.798	48.0

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.27 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 8,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	26206.3
Exposure: MWd/MTU (Gwd)	9000.0 (1225.80)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.98		
Flow: Mlb/hr	96.93 (94.57 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	10 0.487 1.066 31 30
1		24	11 0.520 1.010 23 52
3		23	12 1.165 1.345 29 46
5		22	13 0.962 1.245 27 20
7		21	14 0.867 0.994 15 52
9		20	15 1.133 1.249 27 54
11		19	16 1.258 1.424 27 50
13		18	17 1.305 1.502 29 48
15		17	
17		16	
19		15	
21		14	
23		13	
25		12	
27		11	
29		10	
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	
Control Rod Density: %	6.13	8	
k-effective:	0.99846	7	
Void Fraction:	0.416	6	
Core Delta-P: psia	22.054	5	
Core Plate Delta-P: psia	17.493	4	
Coolant Temp: Deg-F	547.9	3	
In Channel Flow: Mlb/hr	85.72	2	
Total Bypass Flow (%):	11.6	1	
Total Water Rod Flow (%):	2.9		
Source Convergence	0.00008		
		Bottom	
		% AXIAL TILT -14.932 -10.833	
		AVG BOT 8ft/12ft 1.0636 1.0589	
		Active Channel Flow: Mlb/hr 82.88	
		(of total core flow)	
		(of total core flow)	

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.502	17	29	48	1.766	0.799	17	29	8.07	0.805	39.8	12	11.40	0.821	20.7	17
1.487	17	13	32	1.771	0.796	17	13	9.96	0.792	17.2	17	11.42	0.820	20.3	17
1.473	17	27	46	1.776	0.794	12	31	7.58	0.777	42.4	12	11.17	0.811	21.6	17
1.469	17	31	18	1.777	0.793	17	31	7.60	0.776	42.0	12	8.33	0.805	45.8	12
1.462	17	17	32	1.778	0.793	12	15	9.70	0.763	15.8	17	7.95	0.793	48.6	12
1.461	17	15	34	1.781	0.792	17	17	7.38	0.761	43.0	12	7.97	0.792	48.3	12
1.424	16	27	50	1.800	0.784	17	27	9.64	0.756	15.4	17	10.66	0.771	21.2	16
1.415	16	11	28	1.813	0.778	17	15	7.48	0.748	40.1	12	7.86	0.767	46.7	12
1.404	17	25	44	1.828	0.771	12	31	7.08	0.741	44.4	12	10.51	0.766	22.0	17
1.399	17	17	36	1.831	0.770	12	13	9.13	0.737	19.1	17	10.29	0.762	23.9	17

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.28 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 9,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	26706.3
Exposure: MWd/MTU (GWd)	9500.0 (1293.90)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.20		
Flow: Mlb/hr	96.20 (93.86 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.236 4.910 10 0.485 1.056 31 30
1		24	0.682 14.437 11 0.518 1.014 23 52
3		23	0.886 19.481 12 1.161 1.338 29 46
5		22	1.003 23.063 13 0.960 1.238 27 20
7		21	1.007 25.106 14 0.864 0.994 15 52
9		20	0.997 26.449 15 1.141 1.253 27 54
11		19	0.977 27.541 16 1.265 1.427 27 50
13		18	0.948 28.117 17 1.308 1.501 29 48
15		17	0.908 27.828
17		16	0.942 27.908
19		15	0.951 28.418
21		14	0.950 28.709
23		13	1.016 28.568
25		12	1.056 29.430
27		11	1.096 30.131
29		10	1.147 30.778
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.212 31.977
		8	1.266 32.724
		7	1.305 33.120
		6	1.355 34.303
		5	1.366* 34.565*
		4	1.320 33.192
		3	1.201 30.443
		2	0.915 23.376
		Bottom 1	0.257 6.809
Control Rod Density: %	6.13		
k-effective:	0.99846		
Void Fraction:	0.412		
Core Delta-P: psia	21.713		
Core Plate Delta-P: psia	17.153		
Coolant Temp: Deg-F	547.8		
In Channel Flow: Mlb/hr	85.11	Active Channel Flow: Mlb/hr	82.30
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.501	17	29	48	1.748	0.807	17	29	7.48	0.765	42.3	12	10.70	0.780	22.0	17
1.483	17	13	32	1.758	0.802	17	13	9.37	0.752	18.4	17	10.73	0.779	21.6	17
1.474	17	27	46	1.760	0.801	17	29	7.20	0.745	43.4	12	10.53	0.773	22.9	17
1.469	17	29	44	1.765	0.799	17	17	7.21	0.743	43.0	12	7.69	0.766	48.4	12
1.458	17	17	32	1.767	0.798	12	31	9.18	0.728	16.9	17	7.54	0.760	49.6	12
1.457	17	15	34	1.769	0.797	12	15	9.13	0.722	16.5	17	7.56	0.760	49.3	12
1.427	16	27	50	1.776	0.794	17	27	6.91	0.718	43.9	12	10.12	0.740	22.4	16
1.414	16	11	28	1.796	0.785	17	15	7.07	0.714	41.0	12	7.44	0.733	47.6	12
1.406	17	25	44	1.816	0.776	12	31	8.70	0.702	18.8	16	9.61	0.721	25.3	17
1.398	17	17	36	1.817	0.776	12	13	6.64	0.701	45.3	12	7.11	0.720	49.9	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.29 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 9,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	26829.8
Exposure: MWd/MTU (GWd)	9623.6 (1310.80)		
Delta E: MWd/MTU, (GWd)	123.6 (16.83)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.29		
Flow: Mlb/hr	95.88 (93.54 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.237 4.942 10 0.485 1.053 31 30
		24	0.686 14.527 11 0.518 1.015 23 52
		23	0.892 19.598 12 1.160 1.336 29 46
		22	1.009 23.195 13 0.960 1.236 27 20
		21	1.013 25.238 14 0.864 0.994 15 52
		20	1.004 26.580 15 1.143 1.254 27 54
		19	0.984 27.670 16 1.267 1.428 27 50
		18	0.955 28.242 17 1.308 1.500 29 48
		17	0.914 27.947
		16	0.948 28.025
		15	0.958 28.536
		14	0.956 28.827
		13	1.022 28.688
		12	1.061 29.555
		11	1.100 30.261
		10	1.149 30.913
		9	1.212 32.119
		8	1.262 32.873
		7	1.297 33.273
		6	1.343 34.462
		5	1.350+ 34.725*
		4	1.303 33.346
		3	1.185 30.583
		2	0.904 23.483
		Bottom 1	0.254 6.842
			% AXIAL TILT -11.949 -10.789
			AVG BOT 8ft/12ft 1.0483 1.0581
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.13		
k-effective:	0.99848		
Void Fraction:	0.410		
Core Delta-P: psia	21.604		
Core Plate Delta-P: psia	17.044		
Coolant Temp: Deg-F	547.7		
In Channel Flow: Mlb/hr	84.83	Active Channel Flow: Mlb/hr	82.03
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.500	17	29	48	1.742	0.809	17	29	7.37	0.757	42.5	12	31	10.53	0.769	22.3
1.482	17	13	32	1.752	0.805	17	13	9.23	0.743	18.6	17	29	10.56	0.769	21.9
1.474	17	27	46	1.755	0.803	17	29	7.10	0.736	43.6	12	31	10.37	0.763	23.2
1.468	17	29	44	1.760	0.801	17	17	7.12	0.735	43.2	12	27	7.59	0.757	48.7
1.458	17	17	32	1.763	0.800	12	31	9.04	0.719	17.2	17	27	7.44	0.752	49.8
1.457	17	15	34	1.766	0.799	12	15	9.00	0.713	16.8	17	29	7.46	0.751	49.5
1.428	16	27	50	1.770	0.797	17	27	6.80	0.709	44.1	12	45	9.98	0.732	22.7
1.415	16	11	28	1.789	0.788	17	15	6.98	0.706	41.2	12	27	7.33	0.725	47.8
1.407	17	25	44	1.812	0.778	12	31	8.60	0.695	19.1	16	27	9.47	0.712	25.6
1.398	17	17	36	1.812	0.778	12	13	6.60	0.692	44.7	12	49	7.00	0.710	50.1

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.30 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 9,623.6 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	26831.3
Exposure: MWd/MTU (GWd)	9624.6 (1310.90)		
Delta E: MWd/MTU, (GWd)	1.1 (0.15)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.47		
Flow: Mlb/hr	98.71 (96.30 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.225 4.943 10 0.483 1.071 13 46
1		24	0.651 14.527 11 0.526 1.090 21 50
3		23	0.847 19.599 12 1.126 1.322 29 46
5		22	0.961 23.196 13 0.980 1.270 27 42
7		21	0.970 25.239 14 0.896 1.277 23 48
9		20	0.968 26.582 15 1.159 1.252 13 48
11		19	0.959 27.671 16 1.309 1.437 15 42
13		18	0.947 28.243 17 1.302 1.497 29 44
15		17	0.914 27.948
17		16	0.950 28.026
19		15	0.962 28.537
21		14	0.962 28.828
23		13	1.031 28.689
25		12	1.072 29.556
27		11	1.115 30.262
29		10	1.166 30.915
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.231 32.121
		8	1.283 32.875
		7	1.319 33.274
		6	1.367 34.464
		5	1.376* 34.726*
		4	1.330 33.348
		3	1.212 30.584
		2	0.924 23.484
		Bottom 1	0.260 6.842
Control Rod Density: %	6.31		
k-effective:	0.99847		
Void Fraction:	0.410		
Core Delta-P: psia	22.603		
Core Plate Delta-P: psia	18.042		
Coolant Temp: Deg-F	547.9		
In Channel Flow: Mlb/hr	87.35	Active Channel Flow: Mlb/hr	84.47
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.497	17	29	44	1.816	0.776	17	27	7.67	0.765	39.8	12	29	10.92	0.795	21.9
1.483	17	27	46	1.823	0.773	17	31	9.60	0.760	16.8	17	31	7.80	0.773	48.0
1.447	17	25	48	1.824	0.773	17	17	7.39	0.758	42.5	12	31	10.56	0.771	22.3
1.445	17	17	40	1.830	0.770	12	31	7.35	0.744	41.2	12	33	10.79	0.769	19.3
1.437	17	17	44	1.848	0.763	17	17	9.28	0.738	17.2	17	33	8.20	0.759	41.8
1.437	16	15	42	1.851	0.762	12	33	7.15	0.734	42.5	12	25	7.62	0.753	47.8
1.419	17	29	22	1.856	0.760	17	25	9.37	0.733	15.2	17	29	7.44	0.751	49.7
1.416	17	29	48	1.857	0.759	12	31	7.27	0.732	40.7	12	27	7.74	0.736	44.4
1.416	17	21	48	1.861	0.758	12	17	6.94	0.731	45.1	13	27	7.55	0.736	46.6
1.415	17	25	44	1.865	0.756	14	23	6.98	0.721	43.2	12	33	10.09	0.734	21.9

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.31 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 9,624.6 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	27206.3
Exposure: MWd/MTU (GWd)	10000.0 (1362.00)		
Delta E: MWd/MTU, (GWd)	375.4 (51.13)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.63		
Flow: Mlb/hr	98.15 (95.76 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.230 5.038 10 0.482 1.070 13 46
		24	0.667 14.789 11 0.526 1.091 21 50
		23	0.867 19.939 12 1.124 1.316 29 46
		22	0.983 23.583 13 0.978 1.262 27 42
		21	0.993 25.631 14 0.894 1.275 23 48
		20	0.992 26.973 15 1.165 1.256 13 48
		19	0.984 28.059 16 1.314 1.437 15 42
		18	0.972 28.626 17 1.303 1.493 29 44
		17	0.938 28.318
		16	0.975 28.388
		15	0.986 28.904
		14	0.985 29.194
		13	1.053 29.062
		12	1.092 29.943
		11	1.131 30.663
		10	1.176 31.333
		9	1.231 32.561
		8	1.271 33.331
		7	1.291 33.741
		6	1.322* 34.945
		5	1.317 35.208*
		4	1.264 33.812
		3	1.151 31.007
		2	0.880 23.806
		Bottom 1	0.248 6.939
			% AXIAL TILT -11.694 -10.754
			AVG BOT 8ft/12ft 1.0521 1.0576
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.31		
k-effective:	0.99845		
Void Fraction:	0.405		
Core Delta-P: psia	22.366		
Core Plate Delta-P: psia	17.805		
Coolant Temp: Deg-F	547.8		
In Channel Flow: Mlb/hr	86.88	Active Channel Flow: Mlb/hr	84.03
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.493	17	29	44	1.800	0.783	17	27	7.27	0.731	40.5	12	29	10.27	0.754	22.9
1.482	17	27	46	1.807	0.780	17	17	7.01	0.725	43.2	12	31	7.40	0.739	48.7
1.448	17	25	48	1.813	0.778	17	31	9.05	0.722	17.6	17	31	10.23	0.734	20.3
1.443	17	17	40	1.820	0.775	12	31	6.97	0.710	41.9	12	33	9.93	0.731	23.2
1.437	16	15	42	1.833	0.769	17	17	8.84	0.703	17.2	17	29	7.40	0.726	47.1
1.435	17	17	44	1.836	0.768	17	25	6.79	0.702	43.2	12	25	7.23	0.720	48.5
1.418	17	21	48	1.843	0.765	12	33	8.69	0.701	19.0	17	33	7.05	0.718	50.4
1.417	17	29	48	1.848	0.763	12	17	6.90	0.700	41.4	12	27	9.63	0.706	22.8
1.416	17	29	40	1.850	0.762	14	23	6.57	0.697	45.7	13	27	7.18	0.706	47.3
1.413	17	25	44	1.852	0.761	12	31	6.64	0.691	43.9	12	33	7.34	0.704	45.1

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.32 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 10,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	27706.3
Exposure: MWd/MTU (GWd)	10500.0 (1430.10)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.75		
Flow: Mlb/hr	97.73 (95.35 %)		
		Axial Profile	Edit Radial Power
		N(PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.238 5.168 10 0.480 1.070 13 46
		24	0.687 15.148 11 0.525 1.094 21 50
		23	0.892 20.405 12 1.121 1.309 29 46
		22	1.011 24.112 13 0.976 1.253 27 42
		21	1.026 26.167 14 0.892 1.273 23 48
		20	1.027 27.509 15 1.173 1.264 13 48
		19	1.020 28.592 16 1.320 1.437 15 42
		18	1.010 29.153 17 1.305 1.488 29 44
		17	0.976 28.827
		16	1.013 28.886
		15	1.025 29.407
		14	1.021 29.697
		13	1.088 29.572
		12	1.123 30.470
		11	1.155 31.208
		10	1.190 31.897
		9	1.231 33.148
		8	1.252 33.933
		7	1.251 34.347
		6	1.258* 35.560
		5	1.232 35.816*
		4	1.170 34.393
		3	1.061 31.533
		2	0.814 24.209
		Bottom 1	0.229 7.060
			% AXIAL TILT -8.447 -10.659
			AVG BOT 8ft/12ft 1.0367 1.0568
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.31		
k-effective:	0.99850		
Void Fraction:	0.397		
Core Delta-P: psia	22.129		
Core Plate Delta-P: psia	17.568		
Coolant Temp: Deg-F	547.6		
In Channel Flow: Mlb/hr	86.55	Active Channel Flow: Mlb/hr	83.73
Total Bypass Flow (%):	11.4	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.488	17	29	44	1.783	0.791	17	27	6.75	0.684	41.4	12	29	9.39	0.701	24.7
1.479	17	27	46	1.790	0.788	17	17	6.51	0.678	44.1	12	31	6.86	0.692	49.6
1.449	17	25	48	1.796	0.785	17	31	8.28	0.672	19.6	17	31	9.40	0.688	22.6
1.443	17	17	40	1.807	0.780	12	31	6.46	0.664	42.8	12	33	9.14	0.684	25.1
1.437	16	15	42	1.815	0.777	17	25	8.23	0.660	18.3	17	29	6.88	0.682	48.0
1.434	17	17	44	1.817	0.776	17	17	6.34	0.659	43.8	12	25	6.65	0.677	50.4
1.420	17	21	48	1.830	0.770	14	23	8.08	0.657	20.0	17	33	6.73	0.675	49.1
1.417	17	29	48	1.832	0.770	12	17	6.18	0.655	45.8	13	27	8.98	0.665	23.9
1.413	17	23	46	1.832	0.770	12	33	6.40	0.654	42.2	12	27	6.67	0.662	48.1
1.412	16	19	46	1.844	0.765	17	21	6.19	0.653	45.2	14	37	6.42	0.662	51.5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.33 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 10,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	28206.3
Exposure: MWd/MTU (Gwd)	11000.0 (1498.20)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.69		
Flow: Mlb/hr	97.94 (95.55 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.245 5.302 10 0.479 1.072 13 46
		24	0.705 15.516 11 0.524 1.096 21 50
		23	0.915 20.884 12 1.118 1.302 29 46
		22	1.037 24.656 13 0.975 1.243 27 42
		21	1.058 26.721 14 0.890 1.272 23 48
		20	1.062 28.065 15 1.182 1.271 13 48
		19	1.059 29.145 16 1.326 1.440 15 42
		18	1.051 29.701 17 1.306 1.482 29 44
		17	1.017 29.357
		16	1.057 29.404
		15	1.069 29.932
		14	1.063 30.219
		13	1.128 30.100
		12	1.158 31.014
		11	1.181 31.764
		10	1.204 32.467
		9	1.230 33.734
		8	1.230* 34.524
		7	1.207 34.933
		6	1.190 36.144
		5	1.144 36.383*
		4	1.071 34.927
		3	0.966 32.016
		2	0.743 24.580
		Bottom 1	0.210 7.172
			% AXIAL TILT -5.007 -10.508
			AVG BOT 8ft/12ft 1.0210 1.0558
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29			
1			59 :JR
3			55
5			51
7			47
9			43
11			39
13			35
15			31
17			27
19			23
21			19
23			15
25			11
27			7
29			3
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.31		
k-effective:	0.99865		
Void Fraction:	0.388		
Core Delta-P: psia	22.092		
Core Plate Delta-P: psia	17.532		
Coolant Temp: Deg-F	547.4		
In Channel Flow: Mlb/hr	86.79	Active Channel Flow: Mlb/hr	83.99
Total Bypass Flow (%):	11.4	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00005		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR							LHGR									
Value	FT	IR	JR	Value	Margin	FT	IR	JR	Value	Margin	Exp.	FT	IR	JR	K	Value	Margin	Exp.	FT	IR	JR	K
1.482	17	29	44	1.775	0.794	17	27	46	6.28	0.646	42.8	12	31	16	8	6.63	0.659	48.3	12	31	16	8
1.477	17	27	46	1.781	0.792	17	17	40	6.31	0.644	42.0	12	29	20	6	8.68	0.654	25.8	17	31	18	5
1.450	17	25	48	1.788	0.789	17	31	18	6.10	0.634	43.8	12	43	20	8	6.57	0.652	48.1	13	33	42	8
1.443	17	17	40	1.799	0.784	12	31	16	6.02	0.633	44.9	13	45	18	8	6.58	0.651	47.9	12	31	42	8
1.440	16	15	42	1.802	0.782	17	17	44	6.21	0.633	41.9	12	33	18	8	6.36	0.647	50.4	13	15	18	8
1.435	17	17	44	1.802	0.782	17	25	48	6.06	0.629	43.7	13	33	20	8	6.38	0.647	50.0	12	17	42	8
1.422	17	21	48	1.816	0.776	14	23	48	5.99	0.629	44.8	13	43	16	8	6.51	0.646	48.2	12	33	18	8
1.417	17	29	48	1.821	0.774	12	17	42	6.11	0.629	42.8	12	35	16	8	8.69	0.642	23.7	17	31	40	5
1.416	16	19	46	1.827	0.772	17	21	48	7.66	0.626	20.6	17	31	18	5	5.54	0.642	60.9	11	39	12	8
1.414	17	23	46	1.827	0.772	12	33	18	6.06	0.625	43.1	14	37	14	8	6.32	0.641	50.1	12	15	40	8

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.34 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 11,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	28706.3
Exposure: MWd/MTU (GWd)	11500.0 (1566.30)		
Delta E: MWd/MTU, (GWd)	500.0 (68.10)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.56		
Flow: Mlb/hr	98.40 (96.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.250 5.439 10 0.477 1.074 13 46
		24	0.721 15.894 11 0.523 1.099 21 50
		23	0.935 21.374 12 1.115 1.295 29 46
		22	1.061 25.213 13 0.974 1.241 15 44
		21	1.089 27.291 14 0.888 1.270 23 48
		20	1.099 28.639 15 1.190 1.279 13 48
		19	1.100 29.719 16 1.333 1.443 15 42
		18	1.096 30.272 17 1.308 1.477 29 44
		17	1.063 29.910
		16	1.106 29.946
		15	1.118 30.480
		14	1.108 30.763
		13	1.171 30.647
		12	1.195 31.574
		11	1.207 32.333
		10	1.216 33.044
		9	1.225* 34.319
		8	1.204 35.105
		7	1.158 35.497
		6	1.118 36.694
		5	1.054 36.907*
		4	0.972 35.414
		3	0.871 32.454
		2	0.671 24.917
		Bottom 1	0.190 7.274
			% AXIAL TILT -1.399 -10.300
			AVG BOT 8ft/12ft 1.0051 1.0545
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	6.31		
k-effective:	0.99881		
Void Fraction:	0.377		
Core Delta-P: psia	22.144		
Core Plate Delta-P: psia	17.583		
Coolant Temp: Deg-F	547.3		
In Channel Flow: Mlb/hr	87.26	Active Channel Flow: Mlb/hr	84.47
Total Bypass Flow (%):	11.3	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.477	17	29	44	1.771	0.796	17	27	6.22	0.640	42.8	12	31	7.05	0.663	43.2
1.474	17	27	46	1.776	0.794	17	17	6.46	0.635	38.3	12	15	7.10	0.661	42.4
1.451	17	25	48	1.782	0.791	17	31	6.48	0.634	37.8	12	13	6.61	0.655	48.2
1.444	17	17	40	1.792	0.787	17	17	6.26	0.632	40.8	12	31	6.53	0.645	47.8
1.443	16	15	42	1.794	0.786	12	31	6.01	0.629	44.5	13	45	6.37	0.645	50.0
1.436	17	17	44	1.795	0.786	17	25	6.06	0.629	43.7	12	43	6.39	0.645	49.6
1.425	17	21	48	1.805	0.781	14	23	6.15	0.627	42.0	12	33	6.56	0.644	47.3
1.419	16	19	46	1.811	0.778	12	17	5.97	0.624	44.4	13	43	6.49	0.643	48.0
1.418	17	29	48	1.814	0.777	16	15	6.06	0.623	42.7	12	35	6.87	0.640	42.4
1.416	17	23	46	1.814	0.777	17	21	6.03	0.622	43.0	13	33	6.64	0.640	45.5

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.35 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 11,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	29024.7
Exposure: MWd/MTU (Gwd)	11818.4 (1609.70)		
Delta E: MWd/MTU, (Gwd)	318.4 (43.37)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.40		
Flow: Mlb/hr	98.94 (96.53 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure Zone Avg. Max. IR JR	
		Top 25 0.254 5.528 10 0.476 1.075 13 46	
		24 0.730 16.139 11 0.522 1.101 21 50	
		23 0.946 21.691 12 1.113 1.291 29 46	
		22 1.074 25.573 13 0.973 1.241 15 44	
		21 1.107 27.663 14 0.887 1.270 23 48	
		20 1.122 29.015 15 1.195 1.284 13 48	
		19 1.126 30.096 16 1.338 1.446 15 42	
		18 1.125 30.648 17 1.309 1.473 29 44	
		17 1.094 30.275	
		16 1.138 30.304	
		15 1.150 30.841	
		14 1.138 31.121	
		13 1.199 31.007	
		12 1.217 31.940	
		11 1.222* 32.702	
		10 1.222 33.414	
		9 1.219 34.690	
		8 1.186 35.468	
		7 1.126 35.844	
		6 1.073 37.026	
		5 0.999 37.218*	
		4 0.912 35.700	
		3 0.814 32.709	
		2 0.629 25.114	
		Bottom 1 0.178 7.333	
		% AXIAL TILT 0.872 -10.139	
		AVG BOT 8ft/12ft 0.9954 1.0536	
Control Rod Density: %	6.31		
k-effective:	0.99893		
Void Fraction:	0.371		
Core Delta-P: psia	22.283		
Core Plate Delta-P: psia	17.722		
Coolant Temp: Deg-F	547.2		
In Channel Flow: Mlb/hr	87.78	Active Channel Flow: Mlb/hr	84.98
Total Bypass Flow (%):	11.3	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00006		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR K	Value	Margin	Exp. FT	IR JR K	
1.473	17	29 44	1.770	0.797	17	27 46	6.59	0.652	38.9	12 15 36 19	7.19	0.680	43.7	12 15 26 19	
1.473	17	27 46	1.776	0.794	17	17 22	6.61	0.650	38.3	12 13 34 19	7.24	0.678	42.9	12 13 34 19	
1.452	17	25 48	1.776	0.794	17	31 18	6.18	0.639	43.3	12 31 16 9	6.96	0.656	43.4	12 31 50 18	
1.446	16	15 42	1.788	0.789	17	17 44	6.23	0.632	41.4	12 31 20 9	6.57	0.655	48.7	12 31 16 9	
1.444	17	17 40	1.792	0.787	17	25 48	6.35	0.629	39.1	12 21 42 19	6.94	0.655	43.6	12 21 42 19	
1.438	17	17 44	1.793	0.787	12	31 16	5.97	0.629	45.0	13 45 18 9	6.98	0.654	42.9	12 15 32 20	
1.427	17	21 48	1.797	0.785	16	15 42	6.02	0.628	44.2	12 43 20 9	6.73	0.652	46.1	12 21 34 19	
1.422	16	19 46	1.800	0.783	14	23 48	6.10	0.625	42.5	12 33 18 9	6.84	0.647	43.8	12 23 44 19	
1.419	17	29 48	1.807	0.780	12	17 42	5.93	0.624	44.9	13 43 16 9	6.86	0.647	43.6	12 17 34 20	
1.417	17	23 46	1.809	0.779	17	21 48	6.33	0.623	38.4	12 29 50 18	6.49	0.645	48.3	12 31 42 9	

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.36 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 11,818.4 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	29026.5
Exposure: MWd/MTU (GWd)	11819.9 (1609.90)		
Delta E: MWd/MTU, (GWd)	1.5 (0.20)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-29.03		
Flow: Mlb/hr	90.42 (88.21 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.192 5.529 10 0.473 1.041 31 30
		24	0.552 16.140 11 0.505 1.059 21 50
		23	0.710 21.692 12 1.132 1.270 27 26
		22	0.799 25.575 13 0.912 1.208 17 46
		21	0.814 27.665 14 0.862 1.221 23 48
		20	0.830 29.017 15 1.166 1.239 13 48
		19	0.855 30.097 16 1.324 1.424 19 46
		18	0.894 30.649 17 1.348 1.463 25 36
		17	0.934 30.277
		16	1.043 30.306
		15	1.108 30.843
		14	1.141 31.123
		13	1.237 31.008
		12	1.282 31.942
		11	1.310 32.703
		10	1.327 33.416
		9	1.340* 34.692
		8	1.325 35.469
		7	1.292 35.845
		6	1.275 37.028
		5	1.246 37.220*
		4	1.204 35.702
		3	1.131 32.710
		2	0.901 25.115
		Bottom 1	0.259 7.333
			% AXIAL TILT -16.910 -10.138
			AVG BOT 8ft/12ft 1.1138 1.0536
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	3.78		
k-effective:	0.99891		
Void Fraction:	0.419		
Core Delta-P: psia	20.012		
Core Plate Delta-P: psia	15.460		
Coolant Temp: Deg-F	547.4		
In Channel Flow: Mlb/hr	79.82	Active Channel Flow: Mlb/hr	77.11
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.463	17	25	36	1.792	0.787	17	25	7.06	0.718	41.6	12	33	10.04	0.743	23.6
1.457	17	29	36	1.804	0.782	17	27	6.89	0.714	43.5	12	25	9.88	0.733	24.1
1.451	17	19	42	1.807	0.780	17	29	8.90	0.713	18.1	17	29	9.77	0.729	24.6
1.446	17	25	32	1.817	0.776	17	19	8.72	0.707	19.5	17	35	9.78	0.728	24.5
1.440	17	27	34	1.834	0.769	17	25	6.85	0.704	42.8	12	31	9.64	0.723	25.3
1.439	17	21	44	1.838	0.767	12	25	6.81	0.701	42.9	12	37	7.36	0.723	47.2
1.438	17	21	40	1.842	0.766	12	33	6.78	0.699	42.9	12	23	7.33	0.720	47.2
1.437	17	23	34	1.851	0.762	16	19	6.63	0.692	44.3	12	25	7.10	0.717	49.8
1.436	17	23	38	1.852	0.761	17	17	8.45	0.691	20.7	17	25	7.23	0.715	47.9
1.429	17	27	38	1.852	0.761	12	23	8.55	0.690	19.0	17	33	9.70	0.712	22.8

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.37 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 11,819.9 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	29206.3
Exposure: MWd/MTU (Gwd)	12000.0 (1634.40)		
Delta E: MWd/MTU, (Gwd)	180.1 (24.53)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.46		
Flow: Mlb/hr	92.13 (89.89 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.196 5.567 10 0.472 1.037 45 14
		24	0.561 16.246 11 0.505 1.061 21 50
		23	0.721 21.829 12 1.131 1.265 27 26
		22	0.812 25.729 13 0.912 1.209 17 46
		21	0.828 27.822 14 0.863 1.221 23 48
		20	0.845 29.177 15 1.170 1.244 13 48
		19	0.871 30.263 16 1.327 1.426 19 46
		18	0.911 30.822 17 1.348 1.459 25 36
		17	0.953 30.458
		16	1.065 30.496
		15	1.131 31.045
		14	1.163 31.331
		13	1.257 31.222
		12	1.298 32.163
		11	1.321 32.929
		10	1.331 33.644
		9	1.336* 34.921
		8	1.313 35.696
		7	1.271 36.065
		6	1.246 37.244
		5	1.208 37.430*
		4	1.161 35.905
		3	1.086 32.900
		2	0.867 25.266
		Bottom 1	0.248 7.380
			% AXIAL TILT -15.299 -10.147
			AVG BOT 8ft/12ft 1.1068 1.0537
Control Rod Density: %	3.78		
k-effective:	0.99895		
Void Fraction:	0.413		
Core Delta-P: psia	20.518		
Core Plate Delta-P: psia	15.966		
Coolant Temp: Deg-F	547.4		
In Channel Flow: Mlb/hr	81.38	Active Channel Flow: Mlb/hr	78.65
Total Bypass Flow (%):	11.7	(of total core flow)	
Total Water Rod Flow (%):	3.0	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp.	FT	IR JR	K	Value	Margin	Exp.
1.459	17	25 36	1.816	0.777	17	25 36	6.72	0.697	43.7	12	27 26	5	9.69	0.719	24.1
1.453	17	29 36	1.823	0.773	17	27 28	6.68	0.694	43.8	12	35 34	5	9.53	0.710	24.5
1.450	17	19 42	1.829	0.771	17	19 42	8.60	0.691	18.5	17	31 26	4	9.44	0.706	24.9
1.440	17	25 32	1.833	0.769	17	29 26	6.64	0.685	43.1	12	31 24	5	9.42	0.705	25.0
1.440	17	21 44	1.855	0.760	17	25 32	8.42	0.685	19.9	17	35 36	4	6.97	0.702	49.4
1.436	17	21 40	1.857	0.759	12	25 34	6.61	0.682	43.2	12	37 36	5	9.29	0.700	25.7
1.434	17	27 34	1.859	0.759	16	19 46	6.57	0.679	43.2	12	23 32	5	6.88	0.698	50.1
1.434	17	23 38	1.860	0.758	12	33 26	6.50	0.678	44.1	12	41 18	9	6.93	0.697	49.4
1.433	17	23 34	1.862	0.757	17	17 44	6.47	0.677	44.4	12	43 20	9	6.86	0.695	50.1
1.429	17	17 44	1.862	0.757	17	39 18	6.42	0.673	44.6	12	25 24	5	6.82	0.691	49.9

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.38 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 12,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	29706.3
Exposure: MWd/MTU (Gwd)	12500.0 (1702.50)		
Delta E: MWd/MTU, (Gwd)	500.0 (68.10)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.76		
Flow: Mlb/hr	94.33 (92.03 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.206 5.679 10 0.472 1.043 45 14
1		24	0.592 16.551 11 0.505 1.067 39 12
3		23	0.761 22.221 12 1.127 1.259 21 42
5		22	0.857 26.172 13 0.914 1.210 17 46
7		21	0.878 28.275 14 0.863 1.222 23 48
9		20	0.899 29.641 15 1.179 1.253 13 48
11		19	0.929 30.741 16 1.334 1.429 19 46
13		18	0.973 31.323 17 1.346 1.448 25 36
15		17	1.017 30.981
17		16	1.133 31.047
19		15	1.199 31.629
21		14	1.225 31.929
23		13	1.313 31.834
25		12	1.342 32.792
27		11	1.348* 33.565
29		10	1.339 34.280
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.322 35.555
		8	1.276 36.313
		7	1.208 36.656
		6	1.156 37.817
		5	1.092 37.979*
		4	1.024 36.426
		3	0.944 33.384
		2	0.753 25.652
		Bottom 1	0.216 7.498
Control Rod Density: %	3.78		
k-effective:	0.99913		
Void Fraction:	0.397		
Core Delta-P: psia	21.088	% AXIAL TILT	-9.935 -10.113
Core Plate Delta-P: psia	16.535	AVG BOT 8ft/12ft	1.0823 1.0538
Coolant Temp: Deg-F	547.2		
In Channel Flow: Mlb/hr	83.44	Active Channel Flow: Mlb/hr	80.68
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.448	17	25	36	1.827	0.777	17	19	6.59	0.677	42.6	12	43	6.78	0.690	50.3
1.447	17	19	42	1.848	0.768	17	39	6.43	0.676	44.9	12	41	6.93	0.688	48.2
1.440	17	29	36	1.850	0.768	16	19	6.59	0.674	42.3	12	35	6.76	0.686	50.2
1.438	17	21	44	1.851	0.767	17	25	6.59	0.674	42.3	12	33	6.87	0.686	48.8
1.431	17	21	40	1.855	0.766	17	17	6.53	0.670	42.5	12	21	6.86	0.684	48.6
1.429	17	17	44	1.858	0.764	17	17	6.41	0.668	44.1	12	41	6.74	0.684	50.2
1.429	16	19	46	1.858	0.764	16	15	6.56	0.667	41.7	12	37	6.91	0.683	47.8
1.426	17	25	32	1.872	0.759	17	27	6.45	0.666	43.1	12	25	6.88	0.682	48.1
1.426	17	23	38	1.873	0.758	12	41	6.53	0.665	41.8	12	31	6.83	0.681	48.7
1.422	17	23	34	1.873	0.758	17	31	6.52	0.664	41.8	12	37	6.82	0.681	48.7

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.39 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 12,500.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	30506.3
Exposure: MWd/MTU (Gwd)	13300.0 (1811.50)		
Delta E: MWd/MTU, (Gwd)	300.0 (40.86)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-25.92		
Flow: Mlb/hr	100.68 (98.23 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	10 0.470 1.051 45 14
1		24	11 0.504 1.075 39 12
3		23	12 1.122 1.252 41 18
5		22	13 0.915 1.213 43 16
7		21	14 0.862 1.224 37 14
9		20	15 1.192 1.269 13 48
11		19	16 1.344 1.434 41 16
13		18	17 1.346 1.445 19 42
15		17	
17		16	
19		15	
21		14	
23		13	
25		12	
27		11	
29		10	
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	
Control Rod Density: %	3.78	8	
k-effective:	0.99940	7	
Void Fraction:	0.370	6	
Core Delta-P: psia	22.988	5	
Core Plate Delta-P: psia	18.434	4	
Coolant Temp: Deg-F	547.1	3	
In Channel Flow: Mlb/hr	89.28	2	
Total Bypass Flow (%):	11.3	Bottom 1	
Total Water Rod Flow (%):	2.8	0.177	7.657
Source Convergence	0.00009		
		% AXIAL TILT	-2.459 -9.891
		AVG BOT 8ft/12ft	1.0485 1.0533
		Active Channel Flow: Mlb/hr	86.42
		(of total core flow)	
		(of total core flow)	

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.445	17	19	42	1.840	0.772	17	39	6.79	0.699	42.8	12	7.10	0.711	49.0	12
1.437	17	25	26	1.842	0.771	17	19	6.80	0.697	42.5	12	7.14	0.709	48.3	12
1.436	17	39	18	1.843	0.770	16	41	6.64	0.685	43.1	12	7.07	0.708	49.0	12
1.434	16	41	16	1.845	0.770	17	17	6.65	0.685	42.9	12	7.06	0.705	48.8	13
1.431	17	17	44	1.849	0.768	16	15	6.74	0.684	41.4	12	7.04	0.704	48.9	12
1.430	17	29	26	1.854	0.766	17	17	6.57	0.683	43.7	12	7.06	0.704	48.7	13
1.427	16	15	42	1.883	0.754	17	25	6.58	0.681	43.4	13	6.20	0.704	59.3	11
1.426	17	21	40	1.887	0.752	12	41	6.58	0.680	43.3	13	7.01	0.700	48.7	12
1.419	17	17	40	1.889	0.752	17	39	6.70	0.679	41.4	12	6.18	0.699	59.1	11
1.418	17	23	24	1.891	0.751	17	39	6.69	0.679	41.4	12	7.02	0.698	48.3	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.41 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 13,300.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	30506.7
Exposure: MWd/MTU (GWd)	13300.2 (1811.50)		
Delta E: MWd/MTU, (GWd)	0.2 (0.03)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-29.54		
Flow: Mlb/hr	88.92 (86.75 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.231 5.869 10 0.466 1.033 45 14
		24	0.660 17.070 11 0.499 1.062 39 12
		23	0.851 22.888 12 1.136 1.261 21 20
		22	0.972 26.925 13 0.913 1.197 43 16
		21	1.023 29.051 14 0.851 1.220 37 14
		20	1.059 30.438 15 1.170 1.243 13 48
		19	1.084 31.566 16 1.327 1.419 41 16
		18	1.105 32.188 17 1.353 1.449 25 26
		17	1.129 31.886
		16	1.232 31.995
		15	1.280 32.630
		14	1.282 32.946
		13	1.346 32.864
		12	1.347* 33.836
		11	1.323 34.603
		10	1.284 35.300
		9	1.240 36.551
		8	1.168 37.262
		7	1.077 37.542
		6	1.001 38.649
		5	0.919 38.752*
		4	0.840 37.141
		3	0.764 34.036
		2	0.610 26.172
		Bottom 1	0.175 7.657
		% AXIAL TILT	0.678 -9.891
		AVG BOT 8ft/12ft	1.0227 1.0533
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	3.24		
k-effective:	0.99940		
Void Fraction:	0.381		
Core Delta-P: psia	19.126		
Core Plate Delta-P: psia	14.574		
Coolant Temp: Deg-F	546.5		
In Channel Flow: Mlb/hr	78.71	Active Channel Flow: Mlb/hr	76.14
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				M CPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.449	17	25	26	1.710	0.830	17	39	6.53	0.672	42.8	12	43	6.92	0.683	47.8
1.442	17	19	42	1.710	0.830	17	41	6.54	0.671	42.5	12	41	6.86	0.682	48.3
1.438	17	21	40	1.716	0.828	17	39	6.39	0.659	43.1	12	45	6.88	0.680	47.9
1.438	17	29	26	1.720	0.825	17	25	6.45	0.657	41.8	12	41	5.98	0.679	59.3
1.437	17	39	18	1.727	0.822	17	17	6.39	0.657	42.6	12	39	6.79	0.678	48.8
1.435	17	23	24	1.732	0.820	17	23	6.47	0.656	41.4	12	39	6.79	0.677	48.7
1.428	17	23	34	1.734	0.819	16	41	6.33	0.655	43.4	13	45	6.79	0.677	48.6
1.424	17	27	24	1.739	0.816	16	15	6.33	0.654	43.3	13	43	5.95	0.674	59.1
1.422	17	25	32	1.744	0.814	17	31	6.44	0.653	41.4	12	35	6.74	0.673	48.7
1.421	17	17	40	1.747	0.813	17	17	6.44	0.653	41.4	12	27	6.75	0.671	48.3

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.42 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 13,300.2 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31006.3
Exposure: MWd/MTU (Gwd)	13800.0 (1879.60)		
Delta E: MWd/MTU, (Gwd)	499.8 (68.07)		
Power: MWT	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.32		
Flow: Mlb/hr	95.79 (93.46 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	10 0.464 1.040 45 14
		24	11 0.497 1.068 39 12
		23	12 1.133 1.259 39 20
		22	13 0.914 1.201 43 16
		21	14 0.850 1.222 37 14
		20	15 1.178 1.255 47 14
		19	16 1.334 1.426 41 16
		18	17 1.354 1.444 41 20
		17	
		16	
		15	
		14	
		13	
		12	
		11	
		10	
		9	
		8	
		7	
		6	
		5	
		4	
		3	
		2	
		1	
		Bottom	
		% AXIAL TILT	5.103 -9.612
		AVG BOT 8ft/12ft	1.0019 1.0521
Control Rod Density: %	3.24		
k-effective:	0.99955		
Void Fraction:	0.360		
Core Delta-P: psia	21.168		
Core Plate Delta-P: psia	16.616		
Coolant Temp: Deg-F	546.5		
In Channel Flow: Mlb/hr	84.97	Active Channel Flow: Mlb/hr	82.26
Total Bypass Flow (%):	11.3	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR K	Value	Margin	Exp. FT	IR JR K	
1.444	17	41 20	1.744	0.814	17	39 18	6.66	0.691	43.7 12	43 20 12	7.07	0.705	48.6 12	41 18 12	
1.443	17	25 26	1.747	0.813	17	41 42	6.68	0.691	43.3 12	41 18 12	6.99	0.702	49.2 12	17 42 12	
1.439	17	39 18	1.759	0.807	17	39 40	6.51	0.677	43.9 12	45 22 12	7.03	0.702	48.7 12	39 42 12	
1.438	17	39 22	1.761	0.806	16	41 16	6.59	0.677	42.7 12	41 22 12	6.92	0.698	49.6 13	15 18 12	
1.433	17	31 26	1.764	0.805	17	17 40	6.53	0.677	43.4 12	39 16 12	6.93	0.698	49.4 12	41 40 12	
1.432	17	37 24	1.770	0.802	16	15 42	6.68	0.676	41.2 12	39 20 12	6.92	0.698	49.5 13	17 16 12	
1.426	16	41 16	1.777	0.799	17	25 26	6.45	0.673	44.2 13	45 18 12	6.18	0.694	58.5 11	49 40 13	
1.423	17	43 22	1.781	0.797	17	23 24	6.45	0.673	44.1 13	43 16 12	6.91	0.693	49.1 12	39 16 12	
1.422	17	37 28	1.781	0.797	17	17 18	6.62	0.670	41.3 12	35 28 12	6.87	0.692	49.5 12	15 40 12	
1.420	17	43 18	1.800	0.789	17	31 26	6.55	0.670	42.2 12	33 26 11	6.15	0.689	58.3 11	39 12 13	

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.43 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 13,800.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31219.5
Exposure: MWd/MTU (Gwd)	14013.3 (1908.60)		
Delta E: MWd/MTU, (Gwd)	213.3 (29.05)		
Power: Mwt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.24		
Flow: Mlb/hr	99.52 (97.10 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.243 6.056 10 0.463 1.043 45 14
		24	0.698 17.582 11 0.496 1.070 39 12
		23	0.900 23.548 12 1.131 1.258 39 20
		22	1.027 27.681 13 0.914 1.203 43 16
		21	1.085 29.850 14 0.849 1.223 37 14
		20	1.126 31.266 15 1.182 1.261 47 14
		19	1.154 32.415 16 1.338 1.429 41 16
		18	1.177 33.054 17 1.354 1.444 41 20
		17	1.201 32.769
		16	1.309 32.903
		15	1.352 33.571
		14	1.343 33.885
		13	1.398* 33.797
		12	1.382 34.764
		11	1.337 35.507
		10	1.277 36.171
		9	1.211 37.384
		8	1.113 38.039
		7	0.995 38.246
		6	0.895 39.293
		5	0.794 39.333*
		4	0.704 37.664
		3	0.631 34.508
		2	0.504 26.549
		Bottom 1	0.145 7.773
			% AXIAL TILT 6.899 -9.474
			AVG BOT 8ft/12ft 0.9930 1.0516
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	3.24		
k-effective:	0.99968		
Void Fraction:	0.351		
Core Delta-P: psia	22.374		
Core Plate Delta-P: psia	17.822		
Coolant Temp: Deg-F	546.6		
In Channel Flow: Mlb/hr	88.36	Active Channel Flow: Mlb/hr	85.57
Total Bypass Flow (%):	11.2	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR			LHGR		
Value	FT	IR JR	Value	Margin	FT	IR JR	Exp. FT	IR JR K	Value	Margin	Exp. FT
1.444	17	41 20	1.760	0.807	17	39 18	6.70	0.698 44.0 12	7.11	0.712 49.0 12	41 18 12
1.441	17	35 26	1.765	0.805	17	41 42	6.72	0.698 43.7 12	7.07	0.709 49.1 12	39 42 12
1.441	17	39 18	1.773	0.801	16	41 16	6.64	0.684 43.0 12	7.03	0.708 49.6 12	17 42 12
1.438	17	39 22	1.779	0.798	17	39 40	6.73	0.684 41.6 12	7.05	0.705 48.9 12	41 40 12
1.432	17	31 26	1.782	0.797	17	17 40	6.55	0.684 44.2 12	6.95	0.705 50.0 13	15 18 12
1.431	17	37 24	1.783	0.796	16	15 42	6.58	0.684 43.8 12	6.96	0.704 49.9 13	17 16 12
1.429	16	41 16	1.793	0.792	17	17 18	8.46	0.682 19.0 16	6.23	0.703 58.9 11	49 40 13
1.424	17	43 22	1.803	0.788	17	25 26	8.43	0.680 18.9 16	6.95	0.701 49.5 12	39 16 12
1.422	17	43 18	1.803	0.787	17	23 24	6.48	0.679 44.6 13	6.21	0.699 58.7 11	39 12 13
1.421	16	45 20	1.818	0.781	17	23 16	6.49	0.679 44.5 13	6.90	0.699 49.9 12	15 40 12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.44 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 14,013.3 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31506.3
Exposure: MWd/MTU (Gwd)	14300.0 (1947.70)		
Delta E: MWd/MTU, (Gwd)	285.6 (38.90)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-27.75		
Flow: Mlb/hr	94.38 (92.07 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.236 6.131 10 0.453 1.028 45 14
		24	0.674 17.784 11 0.489 1.066 39 12
		23	0.869 23.809 12 1.142 1.280 39 20
		22	0.997 27.980 13 0.931 1.194 43 16
		21	1.066 30.171 14 0.839 1.245 37 14
		20	1.122 31.604 15 1.166 1.243 47 14
		19	1.173 32.768 16 1.333 1.432 41 16
		18	1.227 33.424 17 1.356 1.473 39 18
		17	1.261 33.150
		16	1.358 33.290
		15	1.390 33.966
		14	1.370 34.275
		13	1.416* 34.181
		12	1.389 35.142
		11	1.335 35.872
		10	1.266 36.518
		9	1.194 37.712
		8	1.094 38.341
		7	0.975 38.517
		6	0.874 39.538
		5	0.774 39.552*
		4	0.687 37.859
		3	0.616 34.683
		2	0.495 26.689
		Bottom 1	0.143 7.816
			% AXIAL TILT 8.064 -9.285
			AVG BOT 8ft/12ft 0.9918 1.0508
Control Rod Density: %	2.16		
k-effective:	0.99974		
Void Fraction:	0.355		
Core Delta-P: psia	20.695		
Core Plate Delta-P: psia	16.146		
Coolant Temp: Deg-F	546.3		
In Channel Flow: Mlb/hr	83.71	Active Channel Flow: Mlb/hr	81.04
Total Bypass Flow (%):	11.3	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.473	17	39	18	1.675	0.848	17	39	6.91	0.713	43.1	12	7.51	0.732	46.6	12
1.460	17	41	20	1.694	0.838	17	41	6.92	0.712	42.8	12	7.48	0.731	46.9	12
1.458	17	37	16	1.697	0.837	17	23	6.86	0.711	43.5	12	7.37	0.730	48.0	12
1.457	17	43	22	1.699	0.836	17	41	6.85	0.706	42.9	12	7.40	0.730	47.6	12
1.453	17	39	22	1.699	0.836	17	17	6.91	0.705	42.0	12	7.45	0.728	46.8	12
1.450	17	41	24	1.701	0.835	17	39	6.81	0.705	43.3	12	7.44	0.727	46.8	12
1.446	17	33	16	1.714	0.829	17	15	6.88	0.705	42.3	12	7.37	0.725	47.4	12
1.437	17	35	18	1.715	0.828	17	33	6.89	0.705	42.2	12	7.31	0.723	47.9	12
1.437	17	35	14	1.718	0.826	17	37	8.66	0.703	19.6	16	7.31	0.721	47.6	12
1.437	17	45	24	1.723	0.824	16	41	6.85	0.702	42.5	12	7.21	0.720	48.7	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.46 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 14,300.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31806.3
Exposure: MWd/MTU (Gwd)	14600.0 (1988.60)		
Delta E: MWd/MTU, (Gwd)	300.0 (40.86)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-25.62		
Flow: Mlb/hr	101.82 (99.34 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.243 6.210 10 0.451 1.033 45 14
		24	0.696 18.001 11 0.488 1.070 39 12
		23	0.898 24.090 12 1.140 1.279 39 20
		22	1.028 28.303 13 0.932 1.198 43 16
		21	1.098 30.516 14 0.838 1.246 37 14
		20	1.154 31.967 15 1.172 1.253 47 14
		19	1.204 33.147 16 1.339 1.436 41 16
		18	1.257 33.820 17 1.356 1.473 39 18
		17	1.289 33.557
		16	1.385 33.702
		15	1.414 34.388
		14	1.389 34.690
		13	1.431* 34.588
		12	1.399 35.540
		11	1.337 36.253
		10	1.261 36.879
		9	1.180 38.051
		8	1.068 38.650
		7	0.938 38.790
		6	0.829 39.782*
		5	0.722 39.766
		4	0.633 38.048
		3	0.565 34.852
		2	0.453 26.825
		Bottom 1	0.131 7.858
			% AXIAL TILT 10.783 -9.066
			AVG BOT 8ft/12ft 0.9775 1.0499
Control Rod Density: %	2.16		
k-effective:	0.99984		
Void Fraction:	0.339		
Core Delta-P: psia	23.060		
Core Plate Delta-P: psia	18.510		
Coolant Temp: Deg-F	546.5		
In Channel Flow: Mlb/hr	90.48	Active Channel Flow: Mlb/hr	87.66
Total Bypass Flow (%):	11.1	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR				LHGR			
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR	K	Value	Margin
1.473	17	39 18	1.717	0.827	17	39 18	6.99	0.725	43.6	12	43 20 13	7.62	0.748
1.460	17	41 20	1.736	0.818	17	41 42	7.01	0.725	43.3	12	41 18 13	7.59	0.747
1.458	17	37 16	1.739	0.816	17	23 16	7.04	0.724	42.7	12	41 22 13	7.51	0.745
1.457	17	43 22	1.743	0.815	17	17 40	8.84	0.721	20.2	16	45 20 15	7.51	0.744
1.452	17	39 22	1.744	0.814	17	41 24	8.84	0.720	20.1	16	41 16 15	7.56	0.743
1.448	17	41 24	1.747	0.813	17	39 40	6.94	0.719	43.4	12	39 16 13	7.55	0.743
1.443	17	33 16	1.755	0.809	17	15 24	7.09	0.718	41.2	12	39 20 13	7.45	0.740
1.437	17	35 14	1.755	0.809	16	41 16	6.89	0.717	43.9	12	45 22 13	7.47	0.739
1.437	17	45 24	1.761	0.807	17	33 16	6.96	0.717	42.9	12	43 24 13	7.42	0.736
1.436	16	41 16	1.761	0.806	17	37 20	6.97	0.717	42.7	12	35 16 13	7.45	0.735

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.47 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 14,600.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31806.8
Exposure: MWd/MTU (GWd)	14600.2 (1988.60)		
Delta E: MWd/MTU, (GWd)	0.2 (0.03)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-29.86		
Flow: Mlb/hr	88.00 (85.86 %)		
		Axial Profile	Edit Radial Power
		N (PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.211 6.211 10 0.438 0.992 31 30
		24	0.600 18.002 11 0.468 1.025 39 12
		23	0.775 24.090 12 1.175 1.291 37 22
		22	0.891 28.303 13 0.911 1.244 33 20
		21	0.958 30.516 14 0.805 1.206 37 14
		20	1.018 31.967 15 1.122 1.196 47 14
		19	1.077 33.148 16 1.290 1.389 41 16
		18	1.143 33.820 17 1.390 1.500 37 24
		17	1.201 33.557
		16	1.332 33.702
		15	1.388 34.388
		14	1.387 34.690
		13	1.444* 34.589
		12	1.421 35.540
		11	1.368 36.254
		10	1.300 36.879
		9	1.228 38.051
		8	1.133 38.650
		7	1.026 38.791
		6	0.942 39.782*
		5	0.860 39.766
		4	0.791 38.048
		3	0.731 34.852
		2	0.600 26.825
		Bottom 1	0.175 7.858
			% AXIAL TILT 1.726 -9.066
			AVG BOT 8ft/12ft 1.0363 1.0499
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	0.00		
k-effective:	0.99987		
Void Fraction:	0.376		
Core Delta-P: psia	18.881		
Core Plate Delta-P: psia	14.337		
Coolant Temp: Deg-F	546.2		
In Channel Flow: Mlb/hr	77.87	Active Channel Flow: Mlb/hr	75.31
Total Bypass Flow (%):	11.5	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.500	17	37	24	1.593	0.891	17	23	7.14	0.736	43.0	12	35	7.47	0.749	49.1
1.491	17	39	22	1.611	0.881	17	39	7.15	0.736	42.9	12	37	7.49	0.748	48.7
1.489	17	37	20	1.612	0.881	17	37	7.13	0.735	43.0	12	39	7.41	0.748	49.7
1.483	17	33	24	1.614	0.880	17	39	7.21	0.735	41.9	12	37	7.43	0.746	49.2
1.482	17	35	22	1.616	0.879	17	33	7.14	0.728	42.0	12	31	7.37	0.744	49.6
1.481	17	35	26	1.620	0.876	17	25	7.09	0.728	42.6	12	39	7.42	0.743	49.0
1.481	17	39	26	1.623	0.875	17	25	7.07	0.728	42.9	12	33	7.37	0.742	49.4
1.481	17	37	28	1.626	0.873	17	37	7.10	0.727	42.4	13	33	7.36	0.741	49.4
1.470	17	41	24	1.628	0.872	17	41	6.98	0.727	44.0	12	41	7.47	0.740	48.0
1.469	17	31	22	1.637	0.867	17	31	7.11	0.726	42.1	12	37	7.44	0.740	48.3

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.48 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 14,600.2 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	31956.3
Exposure: MWd/MTU (Gwd)	14750.0 (2009.00)		
Delta E: MWd/MTU, (Gwd)	149.8 (20.40)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-28.26		
Flow: Mlb/hr	92.75 (90.49 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.215 6.246 10 0.437 0.991 45 14
		24	0.613 18.098 11 0.468 1.028 39 12
		23	0.791 24.214 12 1.173 1.289 37 22
		22	0.908 28.446 13 0.911 1.240 33 20
		21	0.975 30.670 14 0.806 1.208 37 14
		20	1.035 32.131 15 1.126 1.202 47 14
		19	1.092 33.320 16 1.293 1.391 41 16
		18	1.158 34.003 17 1.389 1.497 37 24
		17	1.214 33.749
		16	1.344 33.903
		15	1.399 34.597
		14	1.396 34.899
		13	1.450* 34.795
		12	1.425 35.743
		11	1.369 36.449
		10	1.297 37.064
		9	1.221 38.226
		8	1.121 38.811
		7	1.010 38.936
		6	0.921 39.915*
		5	0.835 39.887
		4	0.763 38.159
		3	0.703 34.954
		2	0.577 26.909
		Bottom 1	0.168 7.884
		% AXIAL TILT	3.107 -8.991
		AVG BOT 8ft/12ft	1.0288 1.0497
Control Rod Density: %	0.00		
k-effective:	0.99988		
Void Fraction:	0.366		
Core Delta-P: psia	20.301		
Core Plate Delta-P: psia	15.758		
Coolant Temp: Deg-F	546.3		
In Channel Flow: Mlb/hr	82.18	Active Channel Flow: Mlb/hr	79.52
Total Bypass Flow (%):	11.4	(of total core flow)	
Total Water Rod Flow (%):	2.9	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				M CPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.497	17	37	24	1.636	0.868	17	23	7.17	0.741	43.3	12	7.50	0.754	49.4	12
1.489	17	39	22	1.652	0.859	17	39	7.18	0.741	43.1	12	7.52	0.753	48.9	12
1.488	17	37	20	1.653	0.859	17	37	7.15	0.740	43.3	12	7.44	0.753	49.9	12
1.480	17	35	22	1.658	0.857	17	39	7.23	0.739	42.2	12	7.46	0.751	49.5	12
1.480	17	33	24	1.661	0.855	17	33	7.12	0.733	42.8	12	7.40	0.749	49.9	12
1.478	17	39	26	1.666	0.852	17	25	7.16	0.733	42.3	12	7.44	0.748	49.3	12
1.477	17	35	26	1.668	0.851	17	35	7.09	0.732	43.2	12	7.40	0.747	49.7	12
1.477	17	37	28	1.669	0.851	17	41	7.00	0.732	44.3	12	7.50	0.745	48.3	12
1.468	17	41	24	1.672	0.849	17	37	7.11	0.731	42.7	13	7.47	0.745	48.6	12
1.465	17	31	22	1.683	0.844	17	31	7.13	0.730	42.4	12	7.38	0.745	49.7	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.49 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 14,750.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	32206.3
Exposure: MWd/MTU (Gwd)	15000.0 (2043.00)		
Delta E: MWd/MTU, (Gwd)	250.0 (34.05)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-26.14		
Flow: Mlb/hr	99.88 (97.45 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.223 6.307 10 0.436 0.996 45 14
1		24	0.638 18.263 11 0.467 1.032 39 12
3		23	0.822 24.428 12 1.171 1.286 37 22
5		22	0.941 28.691 13 0.913 1.235 33 20
7		21	1.009 30.934 14 0.806 1.210 37 14
9		20	1.068 32.410 15 1.132 1.210 47 14
11		19	1.124 33.615 16 1.298 1.395 41 16
13		18	1.187 34.315 17 1.388 1.492 37 24
15		17	1.240 34.076
17		16	1.369 34.243
19		15	1.421 34.950
21		14	1.412 35.251
23		13	1.463* 35.142
25		12	1.433 36.084
27		11	1.371 36.775
29		10	1.293 37.373
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.209 38.516
		8	1.101 39.076
		7	0.979 39.173
		6	0.879 40.129*
		5	0.784 40.080
		4	0.707 38.335
		3	0.645 35.115
		2	0.528 27.040
		Bottom 1	0.154 7.925
Control Rod Density: %	0.00	% AXIAL TILT	5.813 -8.852
k-effective:	0.99998	AVG BOT 8ft/12ft	1.0140 1.0492
Void Fraction:	0.350		
Core Delta-P: psia	22.574		
Core Plate Delta-P: psia	18.031		
Coolant Temp: Deg-F	546.5		
In Channel Flow: Mlb/hr	88.64	Active Channel Flow: Mlb/hr	85.83
Total Bypass Flow (%):	11.3	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00008		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.492	17	37	24	1.689	0.841	17	23	7.22	0.750	43.7	12	7.56	0.764	49.8	12
1.486	17	39	22	1.701	0.835	17	39	7.23	0.750	43.6	12	7.63	0.764	49.0	12
1.485	17	37	20	1.701	0.835	17	37	7.21	0.749	43.7	12	7.58	0.763	49.4	12
1.474	17	35	22	1.711	0.830	17	39	7.29	0.749	42.7	12	7.58	0.761	49.2	12
1.473	17	39	26	1.718	0.827	17	41	7.18	0.742	43.3	12	7.53	0.760	49.7	12
1.473	17	33	24	1.718	0.827	17	33	7.16	0.741	43.4	12	7.50	0.758	49.8	12
1.471	17	35	26	1.723	0.824	17	35	7.21	0.741	42.7	12	7.58	0.757	48.7	12
1.470	17	37	28	1.723	0.824	17	25	7.14	0.740	43.6	12	7.53	0.756	49.2	12
1.464	17	41	24	1.728	0.822	17	37	7.18	0.739	42.9	12	7.45	0.756	50.1	12
1.459	17	35	18	1.730	0.821	17	39	7.15	0.739	43.1	13	7.53	0.755	49.1	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.50 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 15,000.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	32353.2
Exposure: MWd/MTU (Gwd)	15146.9 (2063.00)		
Delta E: MWd/MTU, (Gwd)	146.9 (20.00)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1050.1		
Inlet Subcooling: Btu/lbm	-24.16		
Flow: Mlb/hr	107.63 (105.00 %)		
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Axial Profile	Edit Radial Power
1		N(PRA) Power Exposure	Zone Avg. Max. IR JR
3		Top 25 0.228 6.343	10 0.434 0.999 45 14
5		24 0.656 18.364	11 0.466 1.035 39 12
7		23 0.845 24.557	12 1.170 1.285 37 22
9		22 0.966 28.840	13 0.913 1.232 33 20
11		21 1.034 31.093	14 0.806 1.212 37 14
13		20 1.092 32.579	15 1.135 1.216 47 14
15		19 1.146 33.792	16 1.302 1.399 41 16
17		18 1.207 34.502	17 1.388 1.490 37 24
19		17 1.259 34.271	
21		16 1.387 34.446	
23		15 1.437 35.161	
25		14 1.426 35.460	
27		13 1.476* 35.348	
29		12 1.443 36.285	
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		11 1.377 36.968	
		10 1.293 37.554	
		9 1.203 38.684	
		8 1.086 39.229	
		7 0.955 39.308	
		6 0.846 40.250*	
		5 0.745 40.187	
		4 0.662 38.430	
		3 0.600 35.202	
		2 0.489 27.111	
		Bottom 1 0.143 7.948	
Control Rod Density: %	0.00	% AXIAL TILT	7.839 -8.761
k-effective:	1.00080	AVG BOT 8ft/12ft	1.0031 1.0489
Void Fraction:	0.335		
Core Delta-P: psia	25.208		
Core Plate Delta-P: psia	20.664		
Coolant Temp: Deg-F	546.7		
In Channel Flow: Mlb/hr	95.67	Active Channel Flow: Mlb/hr	92.71
Total Bypass Flow (%):	11.1	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.490	17	37	24	1.732	0.820	17	23	7.31	0.760	43.9	12	7.72	0.775	49.3	12
1.486	17	39	22	1.741	0.816	17	37	7.29	0.760	44.0	12	7.64	0.775	50.1	12
1.485	17	37	20	1.741	0.816	17	39	7.36	0.759	42.9	12	7.66	0.774	49.7	12
1.472	17	35	22	1.754	0.810	17	39	7.28	0.758	44.0	12	7.66	0.772	49.5	12
1.471	17	39	26	1.757	0.808	17	41	7.36	0.753	42.2	12	7.61	0.771	50.0	12
1.470	17	33	24	1.763	0.805	17	33	7.24	0.751	43.7	12	7.67	0.768	49.0	12
1.468	17	35	26	1.766	0.804	17	39	7.28	0.751	43.0	12	7.57	0.768	50.0	12
1.468	17	37	28	1.767	0.803	17	35	7.20	0.749	43.9	12	7.61	0.767	49.4	12
1.464	17	41	24	1.768	0.803	17	25	7.24	0.748	43.1	12	7.60	0.766	49.6	12
1.460	17	39	18	1.773	0.801	17	25	7.22	0.747	43.3	12	7.61	0.766	49.4	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.51 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 15,146.9 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	32353.6
Exposure: MWd/MTU (GWd)	15147.3 (2063.10)		
Delta E: MWd/MTU, (GWd)	0.4 (0.06)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1044.8		
Inlet Subcooling: Btu/lbm	-34.44		
Flow: Mlb/hr	92.67 (90.41 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.219 6.344 10 0.440 1.001 45 14
		24	0.627 18.364 11 0.472 1.033 39 12
		23	0.808 24.558 12 1.165 1.273 37 22
		22	0.925 28.840 13 0.917 1.223 33 20
		21	0.991 31.094 14 0.817 1.205 37 14
		20	1.049 32.580 15 1.142 1.219 47 14
		19	1.103 33.793 16 1.299 1.389 41 16
		18	1.165 34.502 17 1.379 1.475 37 24
		17	1.219 34.271
		16	1.348 34.446
		15	1.402 35.161
		14	1.398 35.460
		13	1.456* 35.348
		12	1.434 36.286
		11	1.380 36.968
		10	1.311 37.554
		9	1.235 38.685
		8	1.131 39.229
		7	1.009 39.309
		6	0.906 40.250*
		5	0.806 40.187
		4	0.723 38.431
		3	0.659 35.202
		2	0.539 27.112
		Bottom 1	0.157 7.948
		% AXIAL TILT	4.095 -8.760
		AVG BOT 8ft/12ft	1.0226 1.0489
Control Rod Density: %	0.00		
k-effective:	0.99999		
Void Fraction:	0.339		
Core Delta-P: psia	19.903		
Core Plate Delta-P: psia	15.330		
Coolant Temp: Deg-F	543.9		
In Channel Flow: Mlb/hr	82.28	Active Channel Flow: Mlb/hr	79.68
Total Bypass Flow (%):	11.2	(of total core flow)	
Total Water Rod Flow (%):	2.8	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.475	17	37	24	1.684	0.843	17	23	7.12	0.741	43.9	12	7.39	0.754	50.7	12
1.471	17	39	22	1.694	0.838	17	37	7.10	0.740	44.0	12	7.43	0.754	50.1	12
1.471	17	37	20	1.695	0.838	17	39	7.10	0.740	44.0	12	7.46	0.753	49.7	12
1.457	17	35	22	1.707	0.832	17	39	7.17	0.739	42.9	12	7.37	0.752	50.6	12
1.457	17	39	26	1.713	0.829	17	41	7.09	0.735	43.6	12	7.46	0.752	49.5	12
1.455	17	33	24	1.714	0.829	17	33	6.97	0.734	45.0	12	7.37	0.747	50.0	12
1.454	17	37	28	1.719	0.826	17	35	7.07	0.732	43.4	13	7.39	0.747	49.8	12
1.454	17	35	26	1.720	0.826	17	25	7.03	0.732	43.9	12	7.34	0.747	50.4	12
1.450	17	41	24	1.722	0.824	17	37	7.09	0.731	43.0	12	7.45	0.746	49.1	13
1.447	17	39	18	1.723	0.824	17	39	7.06	0.730	43.3	12	7.40	0.746	49.6	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.52 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 15,147.3 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	32683.2
Exposure: MWd/MTU (GWd)	15476.9 (2108.00)		
Delta E: MWd/MTU, (GWd)	329.6 (44.90)		
Power: MWt	3458.0 (100.00 %)		
Core Pressure: psia	1044.8		
Inlet Subcooling: Btu/lbm	-29.46		
Flow: Mlb/hr	107.63 (105.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA)	Power Exposure Zone Avg. Max. IR JR
		Top 25	0.231 6.426 10 0.437 1.008 45 14
		24	0.666 18.590 11 0.469 1.039 39 12
		23	0.858 24.848 12 1.164 1.274 39 20
		22	0.978 29.173 13 0.917 1.219 33 20
		21	1.043 31.450 14 0.815 1.209 37 14
		20	1.099 32.956 15 1.150 1.231 47 14
		19	1.150 34.188 16 1.306 1.395 41 16
		18	1.208 34.919 17 1.380 1.473 37 24
		17	1.257 34.705
		16	1.386 34.898
		15	1.437 35.630
		14	1.427 35.927
		13	1.483* 35.810
		12	1.455 36.739
		11	1.393 37.404
		10	1.311 37.966
		9	1.220 39.071
		8	1.095 39.579
		7	0.952 39.617
		6	0.832 40.524*
		5	0.720 40.427
		4	0.632 38.644
		3	0.569 35.395
		2	0.464 27.269
		Bottom 1	0.135 7.997
			% AXIAL TILT 8.345 -8.564
			AVG BOT 8ft/12ft 0.9998 1.0482
Control Rod Density: %	0.00		
k-effective:	1.00087		
Void Fraction:	0.311		
Core Delta-P: psia	24.760		
Core Plate Delta-P: psia	20.190		
Coolant Temp: Deg-F	544.5		
In Channel Flow: Mlb/hr	95.85	Active Channel Flow: Mlb/hr	92.96
Total Bypass Flow (%):	10.9	(of total core flow)	
Total Water Rod Flow (%):	2.7	(of total core flow)	
Source Convergence	0.00007		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	IR	Value	Margin	Exp.
1.473	17	37	24	1.777	0.799	17	23	7.28	0.762	44.5	12	37	7.56	0.777	51.3
1.471	17	39	22	1.782	0.797	17	37	7.26	0.761	44.6	12	35	7.60	0.777	50.7
1.470	17	37	20	1.784	0.796	17	39	7.26	0.761	44.6	12	39	7.63	0.776	50.3
1.454	17	35	22	1.800	0.789	17	39	7.33	0.760	43.5	12	37	7.64	0.775	50.1
1.454	17	39	26	1.801	0.789	17	41	7.24	0.756	44.2	12	39	7.54	0.774	51.2
1.452	17	33	24	1.804	0.787	17	39	7.12	0.754	45.6	12	41	7.61	0.770	49.9
1.450	17	35	26	1.812	0.784	17	33	7.25	0.752	43.6	12	31	7.51	0.769	51.0
1.450	17	37	28	1.815	0.783	17	35	7.17	0.751	44.5	12	33	7.57	0.769	50.2
1.449	17	41	24	1.816	0.782	17	25	7.20	0.750	44.0	13	33	7.58	0.768	50.0
1.449	17	39	18	1.817	0.782	17	25	7.20	0.750	43.9	12	35	7.54	0.768	50.4

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.53 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 15,476.9 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	33081.2
Exposure: MWd/MTU (Gwd)	15875.0 (2162.20)		
Delta E: MWd/MTU, (Gwd)	398.0 (54.21)		
Power: MWt	3237.0 (93.61 %)		
Core Pressure: psia	1039.9		
Inlet Subcooling: Btu/lbm	-27.39		
Flow: Mlb/hr	107.63 (105.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	10 0.437 1.014 45 14
		24	11 0.470 1.043 39 12
		23	12 1.160 1.270 39 20
		22	13 0.919 1.211 33 20
		21	14 0.817 1.209 37 14
		20	15 1.158 1.242 47 14
		19	16 1.312 1.398 41 16
		18	17 1.378 1.466 37 24
		17	
		16	
		15	
		14	
		13	
		12	
		11	
		10	
		9	
		8	
		7	
		6	
		5	
		4	
		3	
		2	
		1	
		Bottom	
		% AXIAL TILT	11.492 -8.289
		AVG BOT 8ft/12ft	0.9801 1.0472
Control Rod Density: %	0.00		
k-effective:	0.99999		
Void Fraction:	0.297		
Core Delta-P: psia	24.436		
Core Plate Delta-P: psia	19.871		
Coolant Temp: Deg-F	544.1		
In Channel Flow: Mlb/hr	96.04	Active Channel Flow: Mlb/hr	93.21
Total Bypass Flow (%):	10.8	(of total core flow)	
Total Water Rod Flow (%):	2.6	(of total core flow)	
Source Convergence	0.00009		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.466	17	37	24	1.902	0.756	17	23	6.81	0.718	45.2	12	7.19	0.734	50.7	12
1.465	17	39	22	1.905	0.755	17	37	6.79	0.717	45.3	12	7.17	0.733	50.7	12
1.465	17	37	20	1.908	0.754	17	39	6.79	0.717	45.3	12	7.15	0.733	51.1	12
1.447	17	35	22	1.928	0.746	17	39	6.86	0.717	44.3	12	7.14	0.731	50.9	12
1.447	17	39	26	1.928	0.746	17	41	6.87	0.712	43.6	12	7.16	0.730	50.5	12
1.447	17	39	18	1.929	0.746	17	39	6.75	0.710	45.0	12	7.14	0.727	50.4	12
1.444	17	41	24	1.942	0.741	17	33	6.78	0.709	44.3	12	7.13	0.727	50.6	12
1.444	17	33	24	1.943	0.740	17	25	6.70	0.707	45.2	12	7.10	0.726	50.7	12
1.442	17	35	26	1.944	0.740	17	35	6.81	0.706	43.5	12	7.09	0.725	50.8	12
1.442	17	37	28	1.947	0.738	17	25	6.74	0.706	44.4	12	7.08	0.725	51.0	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.54 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 15,875.0 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	33969.8
Exposure: MWd/MTU (Gwd)	16763.6 (2283.20)		
Delta E: MWd/MTU, (Gwd)	355.4 (48.41)		
Power: MWt	2565.2 (74.18 %)		
Core Pressure: psia	1025.1		
Inlet Subcooling: Btu/lbm	-21.17		
Flow: Mlb/hr	107.63 (105.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29		Top 25	0.279 6.789 10 0.435 1.028 45 14
1		24	0.816 19.594 11 0.468 1.052 39 12
3		23	1.041 26.134 12 1.154 1.265 39 20
5		22	1.164 30.628 13 0.921 1.195 33 20
7		21	1.219 32.991 14 0.818 1.214 23 14
9		20	1.260 34.566 15 1.176 1.268 47 14
11		19	1.286 35.852 16 1.325 1.406 41 16
13		18	1.320 36.647 17 1.375 1.457 37 20
15		17	1.340 36.482
17		16	1.451 36.727
19		15	1.479 37.511
21		14	1.443 37.778
23		13	1.482* 37.629
25		12	1.431 38.511
27		11	1.337 39.080
29		10	1.219 39.522
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58		9	1.093 40.494
		8	0.942 40.834
		7	0.786 40.687
		6	0.662 41.442*
		5	0.560 41.212
		4	0.486 39.330
		3	0.438 36.012
		2	0.360 27.774
		Bottom 1	0.106 8.154
Control Rod Density: %	0.00		
k-effective:	0.99998		
Void Fraction:	0.253		
Core Delta-P: psia	23.532	% AXIAL TILT	19.894 -7.545
Core Plate Delta-P: psia	18.981	AVG BOT 8ft/12ft	0.9268 1.0440
Coolant Temp: Deg-F	543.2		
In Channel Flow: Mlb/hr	96.58	Active Channel Flow: Mlb/hr	93.94
Total Bypass Flow (%):	10.3	(of total core flow)	
Total Water Rod Flow (%):	2.5	(of total core flow)	
Source Convergence	0.00006		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR					LHGR				
Value	FT	IR JR	Value	Margin	FT	IR JR	Value	Margin	Exp. FT	IR JR K	Value	Margin	Exp. FT	IR JR K	
1.457	17	37 20	2.386	0.641	17	39 18	5.50	0.582	45.6 12	37 22 13	5.83	0.599	51.2 12	39 42 14	
1.457	17	39 22	2.401	0.636	16	41 16	5.48	0.582	45.7 12	35 24 13	5.83	0.598	51.1 12	23 26 13	
1.453	17	37 24	2.408	0.635	17	37 20	5.54	0.581	44.7 12	37 26 13	5.80	0.598	51.5 12	25 24 13	
1.444	17	39 18	2.410	0.634	17	41 20	5.48	0.581	45.7 12	39 24 13	5.80	0.596	51.2 12	39 24 13	
1.434	17	41 24	2.416	0.633	17	39 40	5.48	0.579	45.2 12	39 20 13	5.72	0.595	52.2 12	41 40 13	
1.433	17	35 22	2.416	0.632	17	23 24	5.38	0.576	46.6 12	41 22 13	5.81	0.594	50.7 12	41 18 15	
1.433	17	39 26	2.418	0.632	17	23 16	5.47	0.574	44.7 12	31 24 13	5.80	0.594	50.9 12	23 18 14	
1.432	17	35 18	2.426	0.630	17	41 24	5.44	0.574	45.1 12	37 18 13	5.79	0.593	51.0 12	31 24 13	
1.428	17	33 24	2.430	0.629	17	43 22	5.40	0.572	45.6 12	33 22 13	5.78	0.591	50.8 12	39 16 15	
1.426	17	35 26	2.432	0.628	17	17 18	5.43	0.572	45.0 12	35 20 13	5.74	0.591	51.3 12	23 40 13	

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.56 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 16,763.6 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	19	Core Average Exposure: MWd/MTU	34147.6
Exposure: MWd/MTU (Gwd)	16941.3 (2307.40)		
Delta E: MWd/MTU, (Gwd)	177.7 (24.21)		
Power: MWt	2430.3 (70.28 %)		
Core Pressure: psia	1022.1		
Inlet Subcooling: Btu/lbm	-19.94		
Flow: Mlb/hr	107.63 (105.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.287 6.844 10 0.434 1.030 45 14
		24	0.842 19.750 11 0.468 1.054 39 12
		23	1.072 26.333 12 1.153 1.264 39 20
		22	1.194 30.850 13 0.921 1.192 33 20
		21	1.246 33.224 14 0.818 1.215 23 14
		20	1.283 34.806 15 1.179 1.273 47 14
		19	1.305 36.097 16 1.328 1.407 41 16
		18	1.334 36.898 17 1.375 1.455 37 20
		17	1.351 36.736
		16	1.458 36.986
		15	1.483* 37.775
		14	1.442 38.035
		13	1.480 37.880
		12	1.424 38.753
		11	1.324 39.305
		10	1.202 39.727
		9	1.072 40.678
		8	0.918 40.991
		7	0.762 40.818
		6	0.640 41.552*
		5	0.540 41.305
		4	0.469 39.411
		3	0.422 36.085
		2	0.347 27.834
		Bottom 1	0.102 8.173
			% AXIAL TILT 21.578 -7.375
			AVG BOT 8ft/12ft 0.9157 1.0432
IR: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58			
Control Rod Density: %	0.00		
k-effective:	0.99999		
Void Fraction:	0.243		
Core Delta-P: psia	23.358		
Core Plate Delta-P: psia	18.810		
Coolant Temp: Deg-F	543.1		
In Channel Flow: Mlb/hr	96.68	Active Channel Flow: Mlb/hr	94.09
Total Bypass Flow (%):	10.2	(of total core flow)	
Total Water Rod Flow (%):	2.4	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power				MCPR				APLHGR				LHGR			
Value	FT	IR	JR	Value	Margin	FT	IR	Value	Margin	Exp.	FT	Value	Margin	Exp.	FT
1.455	17	37	20	2.506	0.625	17	39	5.21	0.554	45.9	12	5.54	0.571	51.5	12
1.455	17	39	22	2.518	0.622	16	41	5.20	0.553	46.0	12	5.52	0.569	51.5	12
1.451	17	37	24	2.532	0.619	17	41	5.19	0.552	46.1	12	5.49	0.568	51.8	12
1.444	17	39	18	2.533	0.619	17	37	5.24	0.552	45.1	12	5.53	0.567	51.1	12
1.433	17	41	24	2.540	0.617	17	23	5.20	0.550	45.6	12	5.50	0.567	51.6	12
1.431	17	35	22	2.540	0.617	17	39	5.09	0.547	46.9	12	5.51	0.567	51.3	12
1.430	17	35	18	2.551	0.614	17	17	5.16	0.546	45.5	12	5.53	0.567	50.9	12
1.430	17	39	26	2.551	0.614	16	45	5.17	0.545	45.1	12	7.30	0.566	28.7	16
1.426	17	41	20	2.552	0.614	17	41	5.11	0.544	45.9	12	5.49	0.564	51.2	12
1.425	17	33	24	2.553	0.614	17	43	5.14	0.544	45.4	12	5.48	0.564	51.4	12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure A.57 Browns Ferry Unit 2 Cycle 19 Control Rod Pattern and Axial Distributions at 16,941.3 MWd/MTU

Appendix B Elevation Views of the Browns Ferry Unit 2 Cycle 19 Fresh Reload Batch Fuel Assemblies

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**Figure B.1 Elevation View for the Browns Ferry Unit 2 Cycle 19 Fresh
Fuel Reload Batch BFE2-19 ATRIUM 10XM [] Fuel
Assembly Design**

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**Figure B.2 Elevation View for the Browns Ferry Unit 2 Cycle 19 Fresh
Fuel Reload Batch BFE2-19 ATRIUM 10XM [] Fuel
Assembly Design**

[

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**Figure B.3 Elevation View for the Browns Ferry Unit 2 Cycle 19 Fresh
Fuel Reload Batch BFE2-19 ATRIUM 10XM [] Fuel
Assembly Design**

Appendix C Browns Ferry Unit 2 Cycle 19 Fresh Fuel Locations

**Table C.1 Browns Ferry Unit 2 Cycle 19 Reload Fuel Identification
and Locations (Core Coordinates) *(Continued)***

Assembly Type: ATRIUM 10XM BFE2-19

Bundle Description: []

Number Loaded: []

[

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**Table C.1 Browns Ferry Unit 2 Cycle 19 Reload Fuel Identification
and Locations (Core Coordinates) (Continued)**

Assembly Type: ATRIUM 10XM BFE2-19

Bundle Description: []

Number Loaded: []

[

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Appendix D Browns Ferry Unit 2 Cycle 19 Radial Exposure and Power Distributions

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Figure D.1 Browns Ferry Unit 2 Cycle 19 BOC Exposure Distribution (GWd/MTU)

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Figure D.1 Browns Ferry Unit 2 Cycle 19 BOC Exposure Distribution (GWd/MTU) (Continued)

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Figure D.2 Browns Ferry Unit 2 Cycle 19 EOC Exposure Distribution (GWd/MTU)

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Figure D.2 Browns Ferry Unit 2 Cycle 19 EOC Exposure Distribution (GWd/MTU) (Continued)

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Figure D.3 Browns Ferry Unit 2 Cycle 19 EOC Assembly Peak Rod Exposure Distribution (GWd/MTU)

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Figure D.3 Browns Ferry Unit 2 Cycle 19 EOC Assembly Peak Rod Exposure Distribution (GWd/MTU) (Continued)

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**Figure D.4 Browns Ferry Unit 2 Cycle 19 EOC Assembly Peak Pellet Exposure Distribution
(GWd/MTU)**

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Figure D.4 Browns Ferry Unit 2 Cycle 19 EOC Assembly Peak Pellet Exposure Distribution (GWd/MTU) *(Continued)*

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	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29
60									0.275	0.345	0.397	0.421	0.456	0.466	0.481
58								0.371	0.498	0.660	0.784	0.755	0.887	0.905	0.934
56						0.265	0.430	0.586	0.867	0.974	0.977	0.864	1.072	1.128	0.975
54						0.413	0.741	0.926	1.006	1.060	1.076	1.102	1.142	1.191	1.207
52					0.425	0.593	0.949	1.068	1.085	1.119	1.121	1.015	1.161	1.221	1.201
50			0.263	0.410	0.593	0.879	1.011	1.082	1.159	1.165	1.052	1.202	1.222	1.219	1.221
48			0.413	0.733	0.946	1.009	1.083	1.026	1.190	1.230	1.232	1.267	1.238	1.220	0.957
46		0.353	0.561	0.911	1.061	1.078	1.026	1.184	1.244	1.275	1.287	1.272	1.281	1.205	0.996
44	0.255	0.466	0.839	0.988	1.075	1.154	1.187	1.242	1.265	1.303	1.275	1.303	1.264	1.266	1.190
42	0.316	0.543	0.937	1.037	1.108	1.158	1.227	1.272	1.299	1.261	1.262	1.217	1.265	1.254	1.231
40	0.370	0.741	0.925	1.053	1.110	1.049	1.229	1.283	1.271	1.250	0.973	0.995	1.175	1.202	0.962
38	0.397	0.700	0.841	1.084	1.008	1.198	1.266	1.271	1.291	1.215	0.994	0.948	1.175	1.143	0.971
36	0.445	0.870	1.058	1.130	1.154	1.221	1.240	1.292	1.265	1.266	1.179	1.183	1.166	1.186	1.124
34	0.461	0.896	1.118	1.183	1.215	1.217	1.231	1.208	1.268	1.259	1.215	1.151	1.191	1.156	1.171
32	0.480	0.931	0.971	1.200	1.195	1.210	0.957	0.998	1.191	1.226	0.963	0.975	1.131	1.176	0.871
30	0.482	0.933	0.972	1.201	1.197	1.210	0.957	0.998	1.191	1.226	0.963	0.975	1.131	1.176	0.870
28	0.466	0.903	1.124	1.188	1.218	1.219	1.232	1.208	1.268	1.258	1.215	1.152	1.193	1.158	1.175
26	0.455	0.884	1.070	1.139	1.160	1.224	1.241	1.292	1.264	1.265	1.179	1.184	1.168	1.191	1.130
24	0.415	0.752	0.861	1.100	1.014	1.202	1.266	1.271	1.291	1.214	0.992	0.947	1.179	1.150	0.973
22	0.397	0.782	0.976	1.073	1.120	1.051	1.230	1.282	1.271	1.249	0.971	0.993	1.179	1.211	0.963
20	0.348	0.658	0.971	1.057	1.116	1.162	1.227	1.272	1.298	1.260	1.260	1.217	1.267	1.259	1.240
18	0.278	0.495	0.862	1.002	1.082	1.156	1.187	1.241	1.264	1.301	1.273	1.302	1.264	1.269	1.194
16		0.356	0.572	0.919	1.064	1.079	1.024	1.183	1.242	1.272	1.284	1.271	1.280	1.205	0.995
14			0.417	0.736	0.945	1.008	1.081	1.026	1.186	1.226	1.229	1.263	1.236	1.219	0.955
12			0.264	0.410	0.592	0.878	1.008	1.078	1.154	1.159	1.048	1.197	1.217	1.216	1.219
10					0.424	0.591	0.946	1.063	1.077	1.109	1.111	1.007	1.154	1.217	1.199
8						0.410	0.735	0.915	0.991	1.042	1.058	1.088	1.132	1.185	1.204
6						0.262	0.421	0.573	0.843	0.943	0.949	0.847	1.060	1.121	0.973
4								0.346	0.468	0.548	0.748	0.707	0.873	0.898	0.932
2									0.251	0.315	0.371	0.404	0.446	0.461	0.479

**Figure D.5 Browns Ferry Unit 2 Cycle 19 Radial Power Distribution
at 0.0 MWd/MTU**

	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
60	0.479	0.461	0.447	0.404	0.372	0.315	0.252								
58	0.933	0.899	0.874	0.706	0.748	0.549	0.469	0.356							
56	0.974	1.121	1.061	0.847	0.949	0.944	0.844	0.573	0.423	0.262					
54	1.205	1.186	1.133	1.088	1.059	1.042	0.992	0.915	0.735	0.411					
52	1.200	1.218	1.155	1.009	1.112	1.109	1.077	1.062	0.946	0.592	0.424				
50	1.220	1.217	1.217	1.197	1.048	1.158	1.154	1.077	1.008	0.877	0.592	0.410	0.264		
48	0.956	1.219	1.235	1.263	1.228	1.226	1.185	1.025	1.080	1.008	0.945	0.736	0.417		
46	0.995	1.203	1.279	1.269	1.283	1.271	1.240	1.181	1.023	1.078	1.063	0.918	0.572	0.366	
44	1.190	1.265	1.262	1.300	1.272	1.299	1.262	1.239	1.185	1.154	1.080	1.000	0.861	0.495	0.278
42	1.231	1.254	1.263	1.214	1.258	1.258	1.296	1.270	1.225	1.160	1.114	1.055	0.969	0.657	0.347
40	0.962	1.202	1.174	0.992	0.970	1.247	1.268	1.280	1.228	1.049	1.117	1.071	0.974	0.780	0.395
38	0.971	1.143	1.173	0.945	0.990	1.211	1.288	1.269	1.263	1.199	1.012	1.097	0.859	0.750	0.414
36	1.124	1.185	1.164	1.180	1.176	1.262	1.261	1.288	1.238	1.221	1.157	1.137	1.067	0.882	0.454
34	1.172	1.155	1.189	1.149	1.212	1.255	1.264	1.205	1.228	1.216	1.215	1.185	1.122	0.901	0.465
32	0.870	1.175	1.129	0.973	0.960	1.223	1.187	0.994	0.954	1.207	1.194	1.199	0.971	0.931	0.481
30	0.872	1.176	1.130	0.973	0.960	1.223	1.187	0.994	0.953	1.206	1.193	1.198	0.969	0.929	0.479
28	1.175	1.157	1.191	1.150	1.213	1.255	1.264	1.204	1.227	1.214	1.212	1.182	1.117	0.895	0.461
26	1.130	1.190	1.167	1.182	1.177	1.262	1.261	1.288	1.237	1.218	1.153	1.130	1.058	0.871	0.445
24	0.973	1.150	1.177	0.946	0.991	1.212	1.288	1.268	1.263	1.197	1.008	1.086	0.845	0.704	0.399
22	0.963	1.210	1.178	0.993	0.971	1.247	1.269	1.279	1.227	1.047	1.111	1.057	0.949	0.746	0.371
20	1.240	1.259	1.267	1.217	1.260	1.259	1.296	1.270	1.224	1.157	1.108	1.040	0.942	0.547	0.318
18	1.194	1.269	1.265	1.302	1.274	1.301	1.263	1.240	1.185	1.152	1.075	0.989	0.840	0.467	0.256
16	0.995	1.206	1.281	1.272	1.286	1.273	1.242	1.183	1.026	1.077	1.060	0.911	0.562	0.351	
14	0.955	1.220	1.238	1.265	1.231	1.229	1.189	1.028	1.082	1.008	0.945	0.732	0.413		
12	1.220	1.219	1.220	1.202	1.053	1.164	1.158	1.081	1.010	0.878	0.592	0.409	0.262		
10	1.200	1.220	1.160	1.015	1.121	1.118	1.085	1.068	0.950	0.593	0.425				
8	1.206	1.190	1.141	1.100	1.075	1.059	1.006	0.924	0.741	0.413					
6	0.974	1.127	1.072	0.862	0.976	0.974	0.867	0.585	0.428	0.264					
4	0.934	0.905	0.886	0.753	0.783	0.660	0.497	0.367							
2	0.480	0.465	0.456	0.421	0.397	0.345	0.274								

**Figure D.5 Browns Ferry Unit 2 Cycle 19 Radial Power Distribution
at 0.0 MWd/MTU (Continued)**

	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29
60									0.170	0.221	0.250	0.254	0.273	0.267	0.269
58								0.249	0.349	0.470	0.552	0.516	0.593	0.584	0.583
56						0.180	0.303	0.435	0.695	0.797	0.788	0.695	0.823	0.823	0.689
54						0.299	0.568	0.764	1.039	1.127	1.155	1.164	1.174	1.158	0.969
52					0.304	0.474	0.799	0.942	1.176	1.061	1.258	0.991	1.274	1.105	1.271
50			0.180	0.298	0.475	0.778	1.094	1.183	1.079	1.281	1.024	1.330	1.147	1.356	1.174
48			0.296	0.567	0.799	1.094	1.208	0.990	1.297	1.147	1.361	1.202	1.391	1.203	1.392
46		0.242	0.423	0.760	0.940	1.181	0.989	1.294	1.151	1.388	1.212	1.423	1.228	1.419	1.221
44	0.161	0.334	0.684	1.031	1.171	1.077	1.294	1.149	1.374	1.219	1.448	1.264	1.447	1.233	1.422
42	0.207	0.388	0.782	1.118	1.058	1.276	1.142	1.380	1.213	1.431	1.274	1.474	1.251	1.222	1.224
40	0.236	0.531	0.769	1.146	1.250	1.020	1.352	1.201	1.426	1.252	1.475	1.276	1.461	1.238	1.445
38	0.242	0.481	0.684	1.154	0.984	1.321	1.194	1.409	1.236	1.454	1.271	1.481	1.261	1.460	1.252
36	0.268	0.584	0.815	1.163	1.262	1.139	1.381	1.226	1.434	1.242	1.463	1.269	1.461	1.240	1.438
34	0.264	0.577	0.814	1.145	1.092	1.340	1.201	1.410	1.224	1.217	1.242	1.462	1.237	1.394	1.171
32	0.267	0.578	0.681	0.955	1.243	1.144	1.375	1.211	1.415	1.213	1.441	1.247	1.411	1.151	0.967
30	0.268	0.578	0.682	0.955	1.244	1.145	1.375	1.211	1.416	1.214	1.442	1.248	1.413	1.152	0.967
28	0.266	0.580	0.816	1.147	1.094	1.341	1.202	1.412	1.226	1.219	1.245	1.465	1.240	1.398	1.175
26	0.272	0.591	0.820	1.167	1.265	1.141	1.384	1.229	1.439	1.246	1.469	1.275	1.467	1.246	1.445
24	0.251	0.515	0.693	1.161	0.988	1.325	1.197	1.414	1.242	1.461	1.278	1.489	1.269	1.469	1.262
22	0.250	0.553	0.789	1.154	1.256	1.023	1.357	1.205	1.434	1.260	1.484	1.284	1.471	1.245	1.456
20	0.224	0.470	0.797	1.127	1.062	1.281	1.146	1.386	1.219	1.440	1.282	1.484	1.261	1.232	1.236
18	0.172	0.349	0.695	1.039	1.177	1.081	1.299	1.155	1.383	1.227	1.458	1.274	1.459	1.243	1.434
16		0.242	0.428	0.764	0.944	1.185	0.994	1.301	1.158	1.397	1.221	1.434	1.239	1.431	1.232
14			0.298	0.569	0.801	1.098	1.214	0.997	1.305	1.155	1.371	1.212	1.402	1.214	1.403
12			0.181	0.299	0.476	0.781	1.099	1.189	1.086	1.289	1.032	1.340	1.156	1.366	1.183
10					0.306	0.477	0.804	0.947	1.180	1.067	1.264	0.997	1.283	1.114	1.281
8						0.300	0.571	0.767	1.039	1.128	1.158	1.169	1.181	1.166	0.976
6						0.180	0.302	0.433	0.690	0.789	0.783	0.694	0.826	0.828	0.695
4								0.239	0.336	0.394	0.538	0.490	0.593	0.586	0.588
2									0.161	0.208	0.239	0.249	0.272	0.268	0.271

**Figure D.6 Browns Ferry Unit 2 Cycle 19 Radial Power Distribution
at 15,146.9 MWd/MTU (EOFP)**

	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
60	0.268	0.266	0.270	0.247	0.238	0.206	0.161								
58	0.583	0.582	0.589	0.486	0.535	0.391	0.335	0.244							
56	0.689	0.822	0.821	0.690	0.779	0.786	0.687	0.432	0.302	0.180					
54	0.969	1.159	1.174	1.163	1.153	1.124	1.036	0.764	0.569	0.300					
52	1.272	1.107	1.275	0.993	1.259	1.063	1.177	0.944	0.802	0.476	0.305				
50	1.175	1.358	1.149	1.334	1.028	1.285	1.083	1.186	1.098	0.780	0.476	0.299	0.181		
48	1.392	1.206	1.394	1.206	1.366	1.151	1.302	0.995	1.212	1.097	0.801	0.569	0.298		
46	1.222	1.422	1.231	1.427	1.216	1.393	1.156	1.299	0.993	1.185	0.943	0.764	0.429	0.248	
44	1.423	1.234	1.451	1.268	1.453	1.224	1.380	1.153	1.299	1.081	1.177	1.039	0.695	0.349	0.173
42	1.225	1.224	1.254	1.478	1.279	1.438	1.217	1.386	1.146	1.281	1.062	1.128	0.798	0.471	0.225
40	1.446	1.238	1.465	1.279	1.481	1.258	1.433	1.205	1.358	1.024	1.257	1.156	0.790	0.553	0.251
38	1.253	1.463	1.264	1.485	1.276	1.461	1.242	1.415	1.198	1.327	0.990	1.163	0.695	0.516	0.252
36	1.439	1.242	1.464	1.273	1.468	1.246	1.440	1.231	1.387	1.143	1.268	1.170	0.821	0.592	0.273
34	1.172	1.396	1.239	1.465	1.245	1.220	1.228	1.415	1.206	1.345	1.097	1.150	0.818	0.581	0.267
32	0.967	1.152	1.414	1.250	1.445	1.217	1.420	1.215	1.381	1.149	1.248	0.958	0.685	0.581	0.269
30	0.970	1.153	1.415	1.251	1.445	1.217	1.421	1.215	1.381	1.149	1.249	0.958	0.684	0.581	0.269
28	1.175	1.399	1.241	1.468	1.247	1.222	1.229	1.416	1.207	1.346	1.097	1.150	0.818	0.580	0.266
26	1.445	1.247	1.468	1.276	1.471	1.249	1.442	1.233	1.389	1.145	1.268	1.169	0.820	0.588	0.269
24	1.262	1.470	1.270	1.490	1.280	1.464	1.245	1.418	1.201	1.329	0.990	1.161	0.689	0.486	0.245
22	1.456	1.246	1.472	1.285	1.486	1.262	1.437	1.209	1.361	1.026	1.257	1.152	0.780	0.535	0.238
20	1.236	1.232	1.262	1.485	1.284	1.442	1.221	1.389	1.150	1.283	1.064	1.124	0.787	0.392	0.209
18	1.434	1.244	1.459	1.275	1.460	1.229	1.385	1.157	1.302	1.084	1.177	1.036	0.688	0.336	0.163
16	1.232	1.432	1.239	1.435	1.222	1.399	1.160	1.304	0.997	1.188	0.946	0.765	0.427	0.241	
14	1.403	1.214	1.403	1.212	1.373	1.156	1.307	0.999	1.216	1.101	0.804	0.570	0.298		
12	1.183	1.367	1.156	1.341	1.035	1.291	1.088	1.191	1.102	0.783	0.479	0.301	0.182		
10	1.281	1.114	1.284	1.000	1.268	1.070	1.184	0.950	0.806	0.479	0.307				
8	0.977	1.167	1.183	1.173	1.165	1.136	1.046	0.770	0.573	0.301					
6	0.695	0.829	0.830	0.701	0.795	0.804	0.701	0.438	0.304	0.181					
4	0.589	0.589	0.599	0.520	0.558	0.475	0.352	0.248							
2	0.271	0.270	0.276	0.257	0.253	0.224	0.172								

**Figure D.6 Browns Ferry Unit 2 Cycle 19 Radial Power Distribution
at 15,146.9 MWd/MTU (EOFP) (Continued)**

**Appendix E Browns Ferry Unit 2 Cycle 18 EOC Projection Control Rod Patterns and
Core Average Axial Power and Exposure Distributions**

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

Cycle:	18	Core Average Exposure: MWd/MTU	31984.3
Exposure: MWd/MTU (Gwd)	16688.3 (2260.80)		
Delta E: MWd/MTU, (Gwd)	400.2 (54.21)		
Power: MWT	3292.0 (95.20 %)		
Core Pressure: psia	1041.2		
Inlet Subcooling: Btu/lbm	-27.90		
Flow: Mlb/hr	107.63 (105.00 %)		
		Axial Profile	Edit Radial Power
		N(PRA) Power Exposure	Zone Avg. Max. IR JR
		Top 25	0.213 6.074 6 0.532 0.625 13 52
		24	0.662 17.618 7 0.622 0.840 25 56
		23	0.864 23.813 8 0.388 1.212 29 40
		22	0.984 28.111 9 0.496 0.990 31 32
		21	1.035 30.997 10 1.048 1.175 23 42
		20	1.054 32.847 11 1.023 1.192 13 36
		19	1.077 34.482 12 1.357 1.409 13 34
		18	1.098 35.319 13 1.272 1.362 11 36
		17	1.109 34.964 14 1.096 1.280 25 54
		16	1.249 34.255
		15	1.296 34.759
		14	1.313 34.980
		13	1.340* 35.906
		12	1.340 36.543
		11	1.317 36.904
		10	1.276 37.033
		9	1.248 37.891
		8	1.187 38.114
		7	1.092 37.789
		6	1.012 38.649
		5	0.915 38.755*
		4	0.817 37.395
		3	0.732 34.593
		2	0.600 26.712
		Bottom 1	0.171 7.919
		% AXIAL TILT	1.038 -7.705
		AVG BOT 8ft/12ft	1.0230 1.0441
Control Rod Density: %	0.00		
k-effective:	0.99996		
Void Fraction:	0.326		
Core Delta-P: psia	24.572		
Core Plate Delta-P: psia	20.003		
Coolant Temp: Deg-F	545.1		
In Channel Flow: Mlb/hr	95.92	Active Channel Flow: Mlb/hr	93.08
Total Bypass Flow (%):	10.9	(of total core flow)	
Total Water Rod Flow (%):	2.6	(of total core flow)	
Source Convergence	0.00010		

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR			LHGR		
Value	FT	IR JR	Value	Margin	FT IR JR	Value	Margin	Exp. FT IR JR K	Value	Margin	Exp. FT IR JR K
1.409	12	13 34	1.823	0.791	12 31 50	5.81	0.619	46.0 11 27 50 12	6.27	0.653	52.3 10 23 50 12
1.405	12	29 50	1.824	0.790	12 47 34	5.77	0.612	45.8 11 11 34 12	6.26	0.647	51.7 11 27 50 12
1.404	12	29 46	1.834	0.786	12 15 26	5.82	0.609	44.4 11 25 48 12	6.21	0.647	52.4 10 11 38 12
1.403	12	15 36	1.837	0.784	12 15 32	5.71	0.608	46.1 11 23 46 12	6.26	0.644	51.4 10 31 48 12
1.402	12	23 44	1.841	0.783	12 33 48	5.85	0.607	43.5 11 13 36 12	6.18	0.639	51.7 10 13 32 12
1.401	12	27 44	1.843	0.782	12 49 32	5.71	0.606	45.7 10 29 48 12	6.22	0.639	51.2 11 11 34 12
1.400	12	15 32	1.849	0.779	12 29 46	5.63	0.606	47.2 11 21 48 12	6.28	0.638	50.2 10 9 26 12
1.399	12	21 42	1.852	0.778	12 23 44	5.72	0.606	45.5 11 27 46 12	6.34	0.638	49.3 10 25 52 12
1.398	12	29 42	1.857	0.776	12 39 42	5.69	0.605	46.0 10 23 50 12	6.28	0.637	50.2 11 25 48 12
1.398	12	27 48	1.857	0.776	12 17 34	5.77	0.604	44.4 10 25 52 12	5.97	0.636	54.3 11 39 48 12

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure E.1 Browns Ferry Unit 2 Cycle 18 Control Rod Pattern and Axial Distributions at 16,688.3 MWd/MTU

[illegible]

Power				MCPR				APLHGR							LHGR							
Value	FT	IR	JR	Value	Margin	FT	IR	JR	Value	Margin	Exp.	FT	IR	JR	K	Value	Margin	Exp.	FT	IR	JR	K
1.409	12	13	34	2.009	0.739	12	31	50	5.29	0.568	46.9	11	27	50	12	5.69	0.599	53.2	10	23	50	12
1.409	12	29	50	2.017	0.736	12	47	34	5.26	0.563	46.6	11	11	34	12	5.61	0.594	53.8	11	33	50	12
1.401	12	15	36	2.031	0.731	12	15	26	5.33	0.557	44.3	11	25	48	13	5.64	0.593	53.3	10	11	38	12
1.400	12	29	46	2.033	0.730	12	49	32	5.28	0.557	45.3	10	25	52	12	5.66	0.590	52.4	10	31	48	12
1.397	12	27	48	2.035	0.730	12	15	32	5.23	0.557	46.1	11	29	52	12	5.69	0.589	51.8	10	25	52	12
1.397	12	23	44	2.036	0.730	12	33	48	5.23	0.556	46.1	11	23	46	13	5.66	0.588	52.1	11	11	34	12
1.397	12	15	32	2.046	0.726	12	9	34	5.36	0.556	43.5	11	13	36	13	5.65	0.587	52.2	10	9	26	12
1.394	12	27	44	2.049	0.725	12	29	46	5.17	0.555	46.8	10	23	50	12	5.62	0.587	52.6	10	13	32	12
1.393	12	21	42	2.054	0.723	12	23	44	5.23	0.555	45.8	10	29	48	13	5.62	0.587	52.5	11	9	32	12
1.392	12	11	32	2.057	0.722	12	25	46	5.16	0.554	47.0	11	21	48	13	5.70	0.585	51.1	11	25	48	12

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* LHGR calculated with pin-power reconstruction
* CPR calculated with pin-power reconstruction & CPR limit type 3
* Thermal limit file:
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Figure E.2 Browns Ferry Unit 2 Cycle 18 Control Rod Pattern and Axial Distributions at 17,224.4 MWd/MTU

Browns Ferry Unit 2 Cycle 19 LAR Fuel Cycle Design

[illegible]

Top Ten Thermal Limits Summary - Sorted by Margin

Power			MCPR			APLHGR			LHGR					
Value	FT	IR	Value	Margin	FT	IR	Value	Margin	Exp. FT	IR	Value	Margin	Exp. FT	IR
1.412	12	29 50	2.162	0.701	12	31 50	4.96	0.531	46.6 11	27 50 13	5.34	0.559	52.9 10	23 50 13
1.409	12	13 34	2.174	0.697	12	47 34	4.94	0.527	46.2 11	11 34 13	5.27	0.556	53.6 11	33 50 13
1.399	12	15 36	2.188	0.692	12	49 32	4.87	0.521	46.6 11	29 52 12	5.28	0.554	52.9 10	11 38 13
1.397	12	29 46	2.190	0.691	12	15 26	4.90	0.521	45.8 10	25 52 12	5.31	0.552	52.2 10	31 48 13
1.397	12	27 48	2.194	0.690	12	33 48	4.95	0.521	44.9 11	25 48 13	5.28	0.551	52.4 10	25 52 12
1.395	12	11 32	2.194	0.690	12	9 34	4.86	0.520	46.6 11	23 46 13	5.32	0.550	51.7 11	11 34 13
1.395	12	15 32	2.196	0.689	12	15 32	4.98	0.519	44.1 11	13 36 13	5.23	0.549	53.1 11	9 32 12
1.394	12	23 44	2.207	0.686	12	27 52	4.85	0.519	46.5 10	23 50 13	5.27	0.549	52.3 10	13 32 13
1.390	12	27 44	2.211	0.685	12	29 46	4.85	0.518	46.3 10	29 48 13	5.18	0.549	53.7 11	31 10 12
1.389	12	21 42	2.218	0.683	12	23 44	4.79	0.518	47.5 11	21 48 13	5.25	0.549	52.7 10	9 26 11

* LHGR calculated with pin-power reconstruction

* CPR calculated with pin-power reconstruction & CPR limit type 3

* Thermal limit file:

Figure E.3 Browns Ferry Unit 2 Cycle 18 Control Rod Pattern and Axial Distributions at 17,581.7 MWd/MTU