ENCLOSURE 3

MONTICELLO NUCLEAR GENERATING PLANT

CYCLE 27 SUPPLEMENTAL RELOAD LICENSING REPORT

74 pages follow

Global Nuclear Fuel
A Joint Venture of GE, Toshiba, & Hitachi

0000-0146-5423-SRLR
Revision 1
Class I
January 2013

Supplemental Reload Licensing Report

for

Monticello

Reload 26 Cycle 27

Extended Power Uprate (EPU)

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This report supports the licensing work done for the Nuclear Plant EPU license.

Acknowledgement

The engineering and reload licensing analyses, which form the technical basis of this Supplemental Reload Licensing Report, were performed by GNF-A/GEH Nuclear Analysis personnel. The Supplemental Reload Licensing Report was prepared by L. Gaul. This document revision has been verified by Rich McCord.

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The basis for this report is *General Electric Standard Application for Reactor Fuel*, NEDE-24011-P-A-19, May 2012; and the U.S. Supplement, NEDE-24011-P-A-19-US, May 2012.

A proprietary *Fuel Bundle Information Report* (FBIR) supplements this licensing report. The FBIR specifies the thermal-mechanical linear heat generation rate limits and also provides a description of the fuel bundles to be loaded. The document number for this report is 0000-0146-5423-FBIR.

1. Plant Unique Items

Appendix A: Analysis Conditions
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2. Reload Fuel Bundles

Fuel Type	Cycle Loaded	Number
Irradiated:		
GE14-P10DNAB392-16GZ-100T-145-T6-2931 (GE14C)	24	9
GE14-P10DNAB392-17GZ-100T-145-T6-2932 (GE14C)	24	11
GE14-P10DNAB392-16GZ-100T-145-T6-2931 (GE14C)	25	40
GE14-P10DNAB424-14GZ-100T-145-T6-3100 (GE14C)	25	16
GE14-P10DNAB375-16GZ-100T-145-T6-3101 (GE14C)	25	52
GE14-P10DNAB392-16GZ-100T-145-T6-3102 (GE14C)	25	40
GE14-P10DNAB391-12GZ-100T-145-T6-3103 (GE14C)	25	16
GE14-P10DNAB373-16GZ-100T-145-T6-3375 (GE14C)	26	32
GE14-P10DNAB391-16GZ-100T-145-T6-3376 (GE14C)	26	40
GE14-P10DNAB391-15GZ-100T-145-T6-3377 (GE14C)	26	32
GE14-P10DNAB391-12GZ-100T-145-T6-3378 (GE14C)	26	44
New:		
GE14-P10DNAB389-11GZ-100T-145-T6-4178 (GE14C)	27	24
GE14-P10DNAB386-16GZ-100T-145-T6-4177 (GE14C)	27	24
GE14-P10DNAB386-16GZ-100T-145-T6-4176 (GE14C)	27	48
GE14-P10DNAB372-17GZ-100T-145-T6-4175 (GE14C)	27	56
Total:		**484**

3. Reference Core Loading Pattern

	Core Average Exposure	Cycle Exposure
Nominal previous end-of-cycle exposure:	30776 MWd/MT (27919 MWd/ST)	12595 MWd/MT (11426 MWd/ST)
Minimum previous end-of-cycle exposure (for cold shutdown considerations):	30326 MWd/MT (27511 MWd/ST)	12145 MWd/MT (11018 MWd/ST)
Assumed reload beginning-of-cycle exposure:	17040 MWd/MT (15459 MWd/ST)	0 MWd/MT (0 MWd/ST)
Assumed reload end-of-cycle exposure (rated conditions):	30929 MWd/MT (28059 MWd/ST)	13889 MWd/MT (12600 MWd/ST)
Reference core loading pattern:	Figure 1	

4. Calculated Core Effective Multiplication and Control System Worth

Beginning of Cycle, $k_{effective}$	
Uncontrolled (20°C)	1.110
Fully controlled (20°C)	0.955
Strongest control rod out (most reactive condition, 20°C)	0.987
R, Maximum increase in strongest rod out reactivity during the cycle (Δk)	0.000
Cycle exposure at which R occurs	0 MWd/MT (0 MWd/ST)

5. Standby Liquid Control System Shutdown Capability

Boron (ppm) (at 20°C)	Shutdown Margin (Δk) (at 160°C, Xenon Free)	
	Analytical Requirement	Achieved
660	≥0.010	0.021

6. Reload Unique Anticipated Operational Occurrences (AOO) Analysis Initial Condition Parameters[1]

Operating domain: ICF (HBB)
Exposure range : BOC to EOC (Application Condition: 1)

	Peaking Factors						
Fuel Design	Local	Radial	Axial	R-Factor	Bundle Power (MWt)	Bundle Flow (1000 lb/hr)	Initial MCPR
GE14C	1.0	1.42	1.42	0.974	5.877	112.8	1.76

Operating domain: LCF (HBB)
Exposure range : BOC to EOC (Application Condition: 1)

	Peaking Factors						
Fuel Design	Local	Radial	Axial	R-Factor	Bundle Power (MWt)	Bundle Flow (1000 lb/hr)	Initial MCPR
GE14C	1.0	1.44	1.32	0.975	5.966	83.8	1.58

[1] Exposure range designation is defined in Table 7-1. Application condition number is defined in Section 11.

Operating domain: ICF (UB) Exposure range : BOC to EOC (Application Condition: 1)							
	Peaking Factors						
Fuel Design	Local	Radial	Axial	R-Factor	Bundle Power (MWt)	Bundle Flow (1000 lb/hr)	Initial MCPR
GE14C	1.0	1.41	1.25	0.974	5.839	111.2	1.87

Operating domain: LCF (UB) Exposure range : BOC to EOC (Application Condition: 1)							
	Peaking Factors						
Fuel Design	Local	Radial	Axial	R-Factor	Bundle Power (MWt)	Bundle Flow (1000 lb/hr)	Initial MCPR
GE14C	1.0	1.40	1.35	0.975	5.798	83.2	1.69

7. Selected Margin Improvement Options [2]

Recirculation pump trip:	No
Rod withdrawal limiter:	No
Thermal power monitor:	Yes
Improved scram time:	Yes (Option B)
Measured scram time:	No
Exposure dependent limits:	No
Exposure points analyzed:	1

Table 7-1 Cycle Exposure Range Designation

Name	Exposure Range [3]
BOC to EOC	BOC27 to EOC27

[2] Refer to the GESTAR basis document identified at the beginning of this report for the margin improvement options currently supported therein.
[3] End of Rated (EOR) is defined as the cycle exposure corresponding to all rods out, 100% power/100% flow, and normal feedwater temperature. For plants without mid-cycle OLMCPR points, EOR is not applicable.

8. Operating Flexibility Options [4]

The following information presents the operational domains and flexibility options which are supported by the reload licensing analysis.

Extended Operating Domain (EOD):	Yes
EOD type: Maximum Extended Load Line Limit (MELLLA)	
Minimum core flow at rated power:	99.0 %
Increased Core Flow:	Yes
Flow point analyzed throughout cycle:	105.0 %
Feedwater Temperature Reduction:	No
ARTS Program:	Yes
Single Loop Operation:	Yes
Equipment Out of Service:	
Safety/relief valves Out of Service: (credit taken for 5 valves)	Yes
PROOS	Yes

9. Core-wide AOO Analysis Results [5, 6]

Methods used: GEXL-PLUS, TRACG04

[4] Refer to the GESTAR basis document identified at the beginning of this report for the operating flexibility options currently supported therein.
[5] Exposure range designation is defined in Table 7-1. Application condition number is defined in Section 11.
[6] The Q/A (% rated) output is not available from TRACG04, so the Simulated Thermal Power (STP) (% rated) is shown.

Operating domain: ICF (UB) Exposure range : BOC to EOC (Application Condition: 1)				
			Uncorrected ΔCPR/ICPR	
Event	Flux (% rated)	STP (% rated)	GE14C	Fig.
FW Controller Failure	548.5	114.4	0.238	2
Turbine Trip with Bypass	621.3	110.3	0.291	3
Turbine Trip w/o Bypass	550.8	108.5	0.228	4
Load Rejection w/o Bypass	335.4	106.2	0.169	5
Inadvertent HPCI /L8	530.8	120.5	0.248	6

10. Rod Withdrawal Error AOO Summary

The Rod Withdrawal Error (RWE) event was analyzed in the GE BWR Licensing Report *Average Power Range Monitor, Rod Block Monitor and Technical Specification Improvement (ARTS) Program for Monticello Nuclear Generating Plant*, NEDC-30492-P, April 1984.

RWE Results:

RBM Setpoint (%)	ΔCPR
114.0	0.25

The more limiting of the cycle specific and the generic ΔCPR values are reported in the table above. The RWE OLMCPR is determined by adding the ΔCPR for the desired RBM setpoint from the table above to the SLMCPR in Section 11.

The ITSP and LTSP MCPR limits associated with the HTSP reported in the above table are bounded by the Kp limits for this cycle.

The ARTS RWE analysis validated that the following MCPR values provide the required margin for full withdrawal of any control rod during this cycle:

For Power < 90%: MCPR ≥ 1.70

For Power ≥ 90%: MCPR ≥ 1.40

The RBM operability requirements have been evaluated and shown to be sufficient to ensure that the SLMCPR and cladding 1% plastic strain criteria will not be exceeded in the event of a RWE.

11. Cycle SLMCPR and OLMCPR Summary [7] [8] [9]

Two Loop Operation (TLO) safety limit: 1.15

Single Loop Operation (SLO) safety limit: 1.15

Stability MCPR Design Basis: See Section 15

ECCS MCPR Design Basis: See Section 16 (Initial MCPR)

Non-pressurization Events:

Exposure range: BOC to EOC	
	All Fuel Types
Rod Withdrawal Error (114.0 % RBM Setpoint)	1.40
Loss of Feedwater Heating	1.34
Fuel Loading Error (Mislocated)	Not Limiting
Fuel Loading Error (Misoriented)	1.37
Rated Equivalent SLO Pump Seizure [10]	1.45

[7] Exposure range designation is defined in Table 7-1.
[8] For SLO, the MCPR operating limit is equal to the two loop value.
[9] The safety limit values presented include a 0.03 adder in accordance with extended operating domain licensing commitments up to and including operation in the MELLLA+ operating domain.
[10] The cycle-independent OLMCPR for the recirculation pump seizure event for GE14C is 1.62 based on the cycle-specific SLO SLMCPR. When adjusted for the off-rated power/flow conditions of SLO, this limit corresponds to a rated OLMCPR of 1.45. This limit does not require an adjustment for the SLO SLMCPR.

Limiting Pressurization Events OLMCPR Summary Table: [11]

Appl. Cond.	Exposure Range	Option A	Option B
		GE14C	GE14C
1	**Base Case**		
	BOC to EOC	1.74	1.62

Pressurization Events: [12]

Operating domain: ICF (UB) **Exposure range : BOC to EOC (Application Condition: 1)**		
	Option A	**Option B**
	GE14C	**GE14C**
FW Controller Failure	Not Limiting	Not Limiting
Turbine Trip with Bypass	1.62	1.62
Turbine Trip w/o Bypass	Not Limiting	Not Limiting
Load Rejection w/o Bypass	Not Limiting	Not Limiting
Inadvertent HPCI /L8	1.74	1.54

12. Overpressurization Analysis Summary [13]

Event	Psl (psig)	Pdome (psig)	Pv (psig)	Plant Response
MSIV Closure (Flux Scram) - ICF (HBB)	1321	1327	1351	Figure 7
MSIV Closure (Flux Scram) - LCF (HBB)	1306	1312	1333	Figure 8

[11] Each application condition (Appl. Cond.) covers the entire range of licensed flow and feedwater temperature unless specified otherwise. The OLMCPR values presented apply to rated power operation based on the two loop operation safety limit MCPR.
[12] Application condition numbers shown for each of the following pressurization events represent the application conditions for which this event contributed in the determination of the limiting OLMCPR value.
[13] Overpressure calculated at an initial dome pressure of 1010 psig.

13. Fuel Loading Error Results

Variable water gap misoriented bundle analysis: Yes [14]

Misoriented Fuel Bundle	ΔCPR
GE14-P10DNAB373-16GZ-100T-145-T6-3375 (GE14C)	0.21
GE14-P10DNAB391-16GZ-100T-145-T6-3376 (GE14C)	0.15
GE14-P10DNAB391-15GZ-100T-145-T6-3377 (GE14C)	0.07
GE14-P10DNAB391-12GZ-100T-145-T6-3378 (GE14C)	0.15
GE14-P10DNAB372-17GZ-100T-145-T6-4175 (GE14C)	0.21
GE14-P10DNAB386-16GZ-100T-145-T6-4176 (GE14C)	0.18
GE14-P10DNAB386-16GZ-100T-145-T6-4177 (GE14C)	0.22
GE14-P10DNAB389-11GZ-100T-145-T6-4178 (GE14C)	0.20

14. Control Rod Drop Analysis Results

This is a banked position withdrawal sequence plant, therefore, the control rod drop accident analysis is not required. NRC approval is documented in NEDE-24011-P-A-US.

15. Stability Analysis Results

15.1 Stability Option III Solution

Monticello has implemented BWROG Long Term Stability Solution Option III using the Oscillation Power Range Monitor (OPRM) as described in Reference 1 in Section 15.4. The plant specific Hot Channel Oscillation Magnitude (HCOM) (Reference 2 in Section 15.4) and other cycle specific stability parameters are used in the Cycle 27 Option III stability evaluation. Backup Stability Protection (BSP) regions are used by the plant in the event that the Option III OPRM system is declared inoperable.

The following Option III OPRM stability setpoint determination described in Section 15.2 and the implementation of the associated BSP Regions described in Section 15.3 provide the stability licensing bases for Monticello Cycle 27.

[14] Includes a 0.02 penalty due to variable water gap R-factor uncertainty.

15.2 Detect and Suppress Evaluation

A reload Option III evaluation has been performed in accordance with the licensing methodology described in Reference 3 in Section 15.4. The stability based OLMCPR is determined for two conditions as a function of OPRM amplitude setpoint. The two conditions evaluated are: (1) a postulated oscillation at 45% rated core flow quasi steady-state operation (SS), and (2) a postulated oscillation following a two recirculation pump trip (2PT) from the limiting rated power operation state point.

The OPRM-setpoint-dependent OLMCPR(SS) and OLMCPR(2PT) values are calculated for Cycle 27 in accordance with the BWROG regional mode DIVOM guidelines described in Reference 4 in Section 15.4. The Cycle 27 Option III evaluation provides adequate protection against violation of the SLMCPR for the two postulated reactor instability events as long as the plant OLMCPR is equal to or greater than OLMCPR(SS) and OLMCPR(2PT) for the selected OPRM setpoint in Table 15.2-2.

The relationship between the OPRM Successive Confirmation Count Setpoint and the OPRM Amplitude Setpoint is provided in Table E-1 of Reference 3 in Section 15.4 and Table 15.2-1. For intermediate OPRM Amplitude Setpoints, the corresponding OPRM Successive Confirmation Count Setpoints have been obtained by using linear interpolation.

The OPRM setpoints for TLO are conservative relative to SLO and are, therefore, bounding.

Table 15.2-1 Relationship between OPRM Successive Confirmation Count Setpoint and OPRM Amplitude Setpoint

Successive Confirmation Count Setpoint	OPRM Amplitude Setpoint
6	≥1.04
8	≥1.05
9	≥1.06
10	≥1.07
11	≥1.08
12	≥1.09
13	≥1.10
14	≥1.11
15	≥1.13
16	≥1.14
17	≥1.16
18	≥1.19
19	≥1.21
20	≥1.24

Table 15.2-2 OPRM Setpoint Versus OLMCPR

OPRM Amplitude Setpoint	OLMCPR(SS)	OLMCPR(2PT)
1.05	1.28	1.14
1.06	1.30	1.16
1.07	1.33	1.18
1.08	1.35	1.21
1.09	1.38	1.23
1.10	1.40	1.25
1.11	1.43	1.28
1.12	1.46	1.30
1.13	1.49	1.33
1.14	1.52	1.35
OLMCPR Acceptance Criteria	**Off-rated OLMCPR @45% flow**	**Rated Power OLMCPR (see Section 11)**

15.3 Backup Stability Protection

The BSP region boundaries were calculated for Monticello Cycle 27 for normal feedwater temperature operation. The endpoints of the regions are defined in Table 15.3-1. The region boundaries, shown in Figure 9, are defined using the Generic Shape Function (GSF). See Reference 5 in Section 15.4.

Table 15.3-1 BSP Region Intercepts for Normal Feedwater Temperature

Region Boundary Intercept	Power (%)	Flow (%)	Core DR	Highest Channel DR
A1	56.6	40.0	< 0.80	< 0.56
B1	42.6	33.7	< 0.80	< 0.56
A2	64.5	50.0	< 0.80	< 0.56
B2	28.6	31.2	< 0.80	< 0.56

15.4 References

1. *BWR Owners' Group Long-term Stability Solutions Licensing Methodology*, NEDO-31960-A, November 1995 (including Supplement 1).
2. *Reactor Long-Term Stability Solution Option III: Licensing Basis Hot Channel Oscillation Magnitude for Monticello Nuclear Generating Plant*, GHNE-0000-0073-4167-R2, December 2007.
3. *Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications, Licensing Topical Report*, NEDO-32465-A, August 1996.
4. *Plant-Specific Regional Mode DIVOM Procedure Guideline*, GE-NE-0000-0028-9714-R1, June 2005.
5. *Backup Stability Protection (BSP) for Inoperable Option III Solution*, OG-02-0119-260, July 2002.

16. Loss-of-Coolant Accident Results [15]

16.1 10CFR50.46 Licensing Results

The ECCS-LOCA analysis is based on the SAFER/GESTR-LOCA methodology. The licensing results in the new cycle are summarized in the following table.

Table 16.1-1 Licensing Results

Fuel Type	Licensing Basis PCT (°F)	Local Oxidation (%)	Core-Wide Metal-Water Reaction (%)
GE14C	2140	<10.00	< 0.20

The SAFER/GESTR-LOCA analysis results are documented in Reference 1 for GE14C in Section 16.4.

The RHR intertie open line analysis is documented in Reference 2 for GE14C in Section 16.4. Reference 1 for GE14C extends the Reference 2 analysis to EPU. These analyses indicate that plant operation up to 376 MWt with the RHR intertie line open is acceptable from an ECCS performance standpoint, provided a MAPLHGR multiplier of 0.75 is implemented or that the peak bundle power does not exceed 3.9 MWt.

[15] Lattice numbers are defined in the Fuel Bundle Information Report

16.2 10CFR50.46 Error Evaluation

The 10CFR50.46 errors applicable to the Licensing Basis PCT are shown in the following table.

Table 16.2-1 Impact on Licensing Basis Peak Cladding Temperature for GE14C

10CFR50.46 Error Notifications		
Number	**Subject**	**PCT Impact (°F)**
2012-01	PRIME Code Implementation for Fuel Rod T/M Performance, Replacing GESTR	+45
	Total PCT Adder (°F)	+45

After accounting for the error impact, the GE14C Licensing Basis PCT remains below the 10CFR50.46 limit of 2200°F, the Local Oxidation remains below the 10CFR50.46 limit of 17%, and the Core-Wide Metal-Water Reaction remains below the 10CFR50.46 limit of 1%.

16.3 ECCS-LOCA Operating Limits

The ECCS-LOCA composite MAPLHGR operating limits for all fuel bundles in this cycle are shown in the following tables.

Table 16.3-1 MAPLHGR Limits

Bundle Type: GE14-P10DNAB392-16GZ-100T-145-T6-2931 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 7357	Lat. 7358	Lat. 7359	Lat. 7360	Lat. 7361	Lat. 7362	Lat. 7363
0.00 (0.00)	9.41	8.49	8.71	8.80	8.75	9.81	10.43
0.22 (0.20)	9.33	8.53	8.74	8.83	8.79	9.75	10.41
1.10 (1.00)	9.12	8.60	8.80	8.91	8.88	9.61	10.34
2.20 (2.00)	9.06	8.70	8.88	9.01	8.99	9.58	10.34
3.31 (3.00)	9.08	8.80	8.97	9.12	9.11	9.61	10.37
4.41 (4.00)	9.11	8.90	9.06	9.23	9.24	9.65	10.41
5.51 (5.00)	9.15	9.00	9.14	9.31	9.36	9.70	10.46
6.61 (6.00)	9.19	9.10	9.21	9.40	9.48	9.74	10.50
7.72 (7.00)	9.23	9.19	9.30	9.50	9.59	9.78	10.53
8.82 (8.00)	9.25	9.28	9.39	9.64	9.73	9.81	10.55
9.92 (9.00)	9.28	9.38	9.51	9.79	9.88	9.83	10.57
11.02 (10.00)	9.29	9.50	9.63	9.94	10.05	9.85	10.59
12.13 (11.00)	9.31	9.62	9.75	10.10	10.04	9.86	10.60
13.23 (12.00)	9.28	9.71	9.85	9.94	9.78	9.86	10.60
14.33 (13.00)	9.24	9.80	9.92	9.84	9.69	9.82	10.60
15.43 (14.00)	9.20	9.87	9.97	9.83	9.69	9.78	10.56
16.53 (15.00)	9.16	9.93	10.01	9.80	9.66	9.73	10.51
18.74 (17.00)	9.06	10.01	10.05	9.72	9.58	9.64	10.41
22.05 (20.00)	8.92	9.97	10.02	9.57	9.44	9.49	10.27
27.56 (25.00)	8.68	9.70	9.74	9.35	9.22	9.25	10.02
33.07 (30.00)	8.24	9.42	9.46	9.13	9.04	8.95	9.79
38.58 (35.00)	7.58	9.17	9.19	8.89	8.84	8.29	9.28
38.85 (35.24)	7.55	9.14	9.17	8.86	8.82	8.26	9.25
44.09 (40.00)	6.87	8.71	8.71	8.37	8.35	7.64	8.64
49.60 (45.00)	5.68	8.14	8.13	7.81	7.81	6.66	7.99
54.79 (49.71)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.30	7.32	6.90	6.87	5.21	6.83
55.50 (50.35)	--	7.20	7.22	6.81	6.77	5.08	6.72
58.16 (52.77)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	5.84	5.86	5.59	5.44	--	5.25
62.85 (57.01)	--	--	--	--	--	--	4.53
63.13 (57.27)	--	--	--	--	4.68	--	--

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 7357	Lat. 7358	Lat. 7359	Lat. 7360	Lat. 7361	Lat. 7362	Lat. 7363
63.50 (57.61)	--	4.92	4.95	4.79	--	--	--
63.54 (57.65)	--	4.90	--	--	--	--	--
63.68 (57.77)	--	--	4.89	--	--	--	--
63.73 (57.82)	--	--	--	4.73	--	--	--

Table 16.3-2 MAPLHGR Limits

Bundle Type: GE14-P10DNAB424-14GZ-100T-145-T6-3100 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8483	Lat. 8484	Lat. 8485	Lat. 8486	Lat. 8487	Lat. 8488
0.00 (0.00)	9.41	7.87	7.91	7.89	7.80	9.81	10.49
0.22 (0.20)	9.33	7.93	7.97	7.96	7.87	9.76	10.46
1.10 (1.00)	9.12	--	--	8.06	7.97	9.61	10.38
2.20 (2.00)	9.06	8.11	8.16	8.18	8.10	9.58	10.36
3.31 (3.00)	9.07	--	--	--	8.23	9.61	10.38
4.41 (4.00)	9.10	--	8.38	8.43	8.36	9.65	10.41
5.51 (5.00)	9.13	8.42	8.50	8.57	8.50	9.69	10.44
6.61 (6.00)	9.17	8.53	8.61	8.70	8.64	9.73	10.47
7.72 (7.00)	9.20	8.64	8.73	8.85	8.79	9.77	10.50
8.82 (8.00)	9.23	8.75	8.85	8.99	8.95	9.80	10.52
9.92 (9.00)	9.25	8.86	8.98	9.15	9.12	9.82	10.54
11.02 (10.00)	9.27	8.98	9.10	9.31	9.30	9.84	10.55
12.13 (11.00)	9.28	9.08	9.20	9.45	9.46	9.85	10.56
13.23 (12.00)	9.26	9.16	9.23	9.50	9.56	9.86	10.56
14.33 (13.00)	9.22	9.20	9.27	9.56	9.62	9.82	10.56
15.43 (14.00)	9.18	9.23	9.31	--	9.69	9.77	10.52
16.53 (15.00)	9.14	9.26	--	9.68	9.75	9.73	10.47
17.64 (16.00)	9.09	9.30	9.39	9.73	9.80	9.68	10.42
18.74 (17.00)	9.05	--	9.43	9.77	9.83	9.63	10.37
19.84 (18.00)	9.00	9.39	9.46	9.79	9.81	9.58	--
20.94 (19.00)	8.95	9.43	9.49	9.81	9.78	--	--
22.05 (20.00)	--	9.46	9.50	9.82	--	--	--
23.15 (21.00)	8.85	9.48	9.52	9.82	9.69	9.43	10.18
24.25 (22.00)	--	9.50	9.53	9.77	--	--	--
25.35 (23.00)	8.76	9.52	9.53	--	--	9.34	10.08
26.46 (24.00)	8.71	9.53	--	--	--	9.29	10.03
27.56 (25.00)	8.66	9.54	9.54	9.63	9.50	9.24	9.98
33.07 (30.00)	8.22	9.42	9.43	9.41	9.29	8.94	9.75
38.58 (35.00)	7.56	9.01	9.02	9.23	9.12	8.28	9.24
38.85 (35.24)	7.53	8.99	9.00	9.20	9.09	8.25	9.20
44.09 (40.00)	6.84	8.56	8.57	8.76	8.63	7.63	8.59
49.60 (45.00)	5.65	7.80	7.82	8.26	8.13	6.64	7.94

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8483	Lat. 8484	Lat. 8485	Lat. 8486	Lat. 8487	Lat. 8488
54.68 (49.61)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	6.66	6.68	7.23	7.26	5.19	6.77
55.50 (50.35)	--	6.54	6.56	7.12	7.16	5.06	6.66
58.10 (52.71)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	4.93	4.95	5.63	5.76	--	5.16
60.90 (55.25)	--	4.85	--	--	--	--	--
60.96 (55.30)	--	--	4.85	--	--	--	--
62.63 (56.82)	--	--	--	--	--	--	4.51
62.80 (56.97)	--	--	--	4.93	--	--	--
63.16 (57.30)	--	--	--	--	4.95	--	--

Table 16.3-3 MAPLHGR Limits

Bundle Type: GE14-P10DNAB375-16GZ-100T-145-T6-3101 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8489	Lat. 8490	Lat. 8491	Lat. 8492	Lat. 8493	Lat. 8494
0.00 (0.00)	9.41	8.40	8.40	8.45	8.35	9.81	10.35
0.22 (0.20)	9.33	8.43	8.45	8.50	8.40	9.76	10.33
1.10 (1.00)	9.12	8.48	8.53	8.59	8.49	9.61	10.26
2.20 (2.00)	9.06	--	8.60	--	8.62	9.58	10.26
3.31 (3.00)	9.07	--	--	8.82	8.74	9.61	10.29
4.41 (4.00)	9.10	--	8.72	8.88	8.87	9.65	10.33
5.51 (5.00)	9.13	8.75	8.78	8.95	9.01	9.69	10.38
6.61 (6.00)	9.17	8.82	8.86	9.04	9.12	9.73	10.42
7.72 (7.00)	9.20	8.89	8.95	9.16	9.24	9.77	10.45
8.82 (8.00)	9.23	8.97	9.05	9.30	9.38	9.80	10.48
9.92 (9.00)	9.25	9.07	9.17	9.44	9.53	9.82	10.50
11.02 (10.00)	9.27	9.18	9.29	9.59	9.68	9.84	10.51
12.13 (11.00)	9.28	9.29	9.41	9.74	9.68	9.85	10.52
13.23 (12.00)	9.26	9.37	9.49	9.62	9.45	9.86	10.52
14.33 (13.00)	9.22	9.45	9.56	9.54	9.40	9.82	10.52
15.43 (14.00)	9.18	9.52	9.62	9.55	9.41	9.77	10.47
16.53 (15.00)	9.14	9.58	9.67	--	9.39	9.73	10.43
17.64 (16.00)	9.09	9.63	9.71	9.50	9.36	9.68	10.38
18.74 (17.00)	9.05	9.67	9.74	9.47	9.33	9.63	10.33
19.84 (18.00)	9.00	9.70	9.76	9.43	9.30	9.58	--
20.94 (19.00)	8.95	9.66	9.73	9.39	--	--	10.23
22.05 (20.00)	--	9.62	9.68	--	--	--	--
23.15 (21.00)	8.85	9.57	9.63	--	--	9.43	10.13
24.25 (22.00)	--	9.53	--	9.26	9.13	--	--
25.35 (23.00)	8.76	9.48	--	9.21	--	9.34	10.03
26.46 (24.00)	8.71	--	--	9.17	9.05	9.29	--
27.56 (25.00)	8.66	9.38	9.42	9.13	9.01	9.24	9.93
33.07 (30.00)	8.22	9.13	9.16	8.95	8.84	8.94	9.70
38.58 (35.00)	7.56	8.91	8.94	8.73	8.60	8.28	9.17
38.85 (35.24)	7.53	8.89	8.91	8.70	8.58	8.25	9.14
44.09 (40.00)	6.84	8.40	8.40	8.21	8.13	7.63	8.52
49.60 (45.00)	5.65	7.86	7.86	7.71	7.57	6.64	7.85

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8489	Lat. 8490	Lat. 8491	Lat. 8492	Lat. 8493	Lat. 8494
54.68 (49.61)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	6.96	6.90	6.70	6.58	5.19	6.68
55.50 (50.35)	--	6.84	6.79	6.60	6.47	5.06	6.56
58.10 (52.71)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	5.28	5.31	5.24	5.02	--	5.04
61.88 (56.14)	--	--	--	--	4.64	--	--
61.93 (56.19)	--	4.86	--	--	--	--	--
62.00 (56.24)	--	--	4.87	--	--	--	--
62.29 (56.51)	--	--	--	--	--	--	4.49
62.53 (56.72)	--	--	--	4.67	--	--	--

Table 16.3-4 MAPLHGR Limits

Bundle Type: GE14-P10DNAB392-16GZ-100T-145-T6-3102 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8495	Lat. 8496	Lat. 8497	Lat. 8498	Lat. 8499	Lat. 8500
0.00 (0.00)	9.41	8.50	8.71	8.79	8.75	9.81	10.43
0.22 (0.20)	9.33	8.54	8.74	8.83	8.79	9.76	10.40
1.10 (1.00)	9.12	8.61	8.80	8.91	--	9.61	10.33
2.20 (2.00)	9.06	8.71	8.88	9.00	8.98	9.58	10.33
3.31 (3.00)	9.07	--	--	9.10	9.10	9.61	10.36
4.41 (4.00)	9.10	8.90	9.05	9.21	9.21	9.65	10.40
5.51 (5.00)	9.13	9.01	9.12	9.28	9.33	9.69	10.44
6.61 (6.00)	9.17	9.10	9.19	9.36	9.44	9.73	10.48
7.72 (7.00)	9.20	9.18	9.27	9.47	9.55	9.77	10.51
8.82 (8.00)	9.23	9.27	9.36	9.59	9.68	9.80	10.54
9.92 (9.00)	9.25	9.37	9.47	9.74	9.83	9.82	10.55
11.02 (10.00)	9.27	9.49	9.58	9.89	9.99	9.84	10.57
12.13 (11.00)	9.28	9.61	9.70	10.03	9.95	9.85	10.58
13.23 (12.00)	9.26	9.70	9.79	9.87	9.70	9.86	10.58
14.33 (13.00)	9.22	9.78	9.86	9.78	9.63	9.82	10.58
15.43 (14.00)	9.18	9.85	9.91	9.78	9.64	9.77	10.53
16.53 (15.00)	9.14	9.91	9.95	9.76	9.62	9.73	10.49
17.64 (16.00)	9.09	9.96	9.98	9.73	9.59	9.68	10.44
18.74 (17.00)	9.05	9.99	10.00	9.70	9.56	9.63	10.39
19.84 (18.00)	9.00	10.01	10.02	9.66	9.52	9.58	--
20.94 (19.00)	8.95	10.01	10.03	9.61	9.48	--	--
22.05 (20.00)	--	9.96	10.00	--	--	--	--
23.15 (21.00)	8.85	9.91	--	--	--	9.43	10.19
24.25 (22.00)	--	--	--	9.48	9.34	--	--
25.35 (23.00)	8.76	--	--	--	--	9.34	10.09
26.46 (24.00)	8.71	--	9.79	--	9.26	9.29	10.05
27.56 (25.00)	8.66	9.70	9.73	9.35	9.22	9.24	10.00
33.07 (30.00)	8.22	9.43	9.46	9.15	9.03	8.94	9.77
38.58 (35.00)	7.56	9.17	9.19	8.95	8.82	8.28	9.25
38.85 (35.24)	7.53	9.14	9.17	8.93	8.80	8.25	9.22
44.09 (40.00)	6.84	8.71	8.71	8.45	8.33	7.63	8.60
49.60 (45.00)	5.65	8.13	8.12	7.89	7.85	6.64	7.96

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8495	Lat. 8496	Lat. 8497	Lat. 8498	Lat. 8499	Lat. 8500
54.68 (49.61)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.27	7.28	7.01	6.84	5.19	6.79
55.50 (50.35)	--	7.16	7.18	6.92	6.74	5.06	6.68
58.10 (52.71)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	5.79	5.81	5.64	5.39	--	5.19
62.69 (56.87)	--	--	--	--	--	--	4.52
63.00 (57.16)	--	--	--	--	4.67	--	--
63.41 (57.53)	--	4.90	--	--	--	--	--
63.50 (57.61)	--	--	4.89	4.77	--	--	--
63.52 (57.62)	--	--	4.89	--	--	--	--
63.66 (57.75)	--	--	--	4.72	--	--	--

Table 16.3-5 MAPLHGR Limits

Bundle Type: GE14-P10DNAB391-12GZ-100T-145-T6-3103 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8501	Lat. 8502	Lat. 8503	Lat. 8504	Lat. 8505	Lat. 8506
0.00 (0.00)	9.41	8.90	8.90	9.03	8.96	9.81	10.15
0.22 (0.20)	9.33	8.92	8.92	9.06	8.99	9.76	10.12
1.10 (1.00)	9.12	8.97	8.97	9.11	9.08	9.61	10.02
2.20 (2.00)	9.06	9.03	9.03	9.19	9.20	9.58	10.02
3.31 (3.00)	9.07	9.09	--	9.27	9.32	9.61	10.05
4.41 (4.00)	9.10	9.16	9.17	--	9.42	9.65	10.10
5.51 (5.00)	9.13	9.23	9.24	9.44	9.52	9.69	10.15
6.61 (6.00)	9.17	9.30	9.30	9.50	9.58	9.73	10.19
7.72 (7.00)	9.20	9.37	9.35	9.57	9.66	9.77	10.23
8.82 (8.00)	9.23	9.42	9.43	9.68	9.76	9.80	10.25
9.92 (9.00)	9.25	9.49	9.52	9.79	9.89	9.82	10.27
11.02 (10.00)	9.27	9.56	9.62	--	10.02	9.84	10.29
12.13 (11.00)	9.28	9.65	9.72	10.05	9.92	9.85	10.30
13.23 (12.00)	9.26	9.73	9.81	9.85	9.69	9.86	10.30
14.33 (13.00)	9.22	--	9.87	9.78	9.63	9.82	10.29
15.43 (14.00)	9.18	9.85	9.91	9.78	9.64	9.77	10.24
16.53 (15.00)	9.14	9.91	9.95	9.77	9.63	9.73	10.19
17.64 (16.00)	9.09	9.95	9.98	9.74	9.60	9.68	10.14
18.74 (17.00)	9.05	9.98	10.00	9.70	9.57	9.63	10.10
19.84 (18.00)	9.00	10.00	10.01	9.66	9.52	9.58	--
20.94 (19.00)	8.95	10.01	10.02	9.62	--	--	--
22.05 (20.00)	--	9.96	10.01	--	--	--	--
23.15 (21.00)	8.85	9.91	--	--	9.39	9.43	9.89
24.25 (22.00)	--	--	--	9.48	--	--	9.84
25.35 (23.00)	8.76	--	--	9.44	9.30	9.34	--
26.46 (24.00)	8.71	9.75	9.79	9.39	--	9.29	9.75
27.56 (25.00)	8.66	9.70	9.74	9.35	9.22	9.24	9.70
33.07 (30.00)	8.22	--	9.47	9.16	9.03	8.94	9.46
38.58 (35.00)	7.56	9.17	9.19	8.95	8.83	8.28	8.87
38.85 (35.24)	7.53	9.15	9.17	8.93	8.80	8.25	8.84
44.09 (40.00)	6.84	8.72	8.71	8.45	8.33	7.63	8.22
49.60 (45.00)	5.65	8.14	8.13	7.89	7.85	6.64	7.44

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 8482	Lat. 8501	Lat. 8502	Lat. 8503	Lat. 8504	Lat. 8505	Lat. 8506
54.68 (49.61)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.28	7.29	7.02	6.84	5.19	6.26
55.50 (50.35)	--	7.18	7.19	6.92	6.74	5.06	6.13
58.10 (52.71)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	5.81	5.82	5.64	5.39	--	4.47
60.86 (55.21)	--	--	--	--	--	--	4.40
62.99 (57.14)	--	--	--	--	4.67	--	--
63.50 (57.61)	--	4.90	4.91	4.77	--	--	--
63.60 (57.70)	--	4.87	--	--	--	--	--
63.61 (57.71)	--	--	4.87	--	--	--	--
63.64 (57.73)	--	--	--	4.73	--	--	--

Table 16.3-6 MAPLHGR Limits

Bundle Type: GE14-P10DNAB373-16GZ-100T-145-T6-3375 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9553	Lat. 9554	Lat. 9555	Lat. 9556	Lat. 9557	Lat. 9558
0.00 (0.00)	9.41	8.36	8.36	8.41	8.31	9.81	10.36
0.22 (0.20)	9.33	8.39	8.41	8.47	8.37	9.76	10.33
1.10 (1.00)	9.12	8.44	8.49	8.55	8.46	9.61	10.26
2.20 (2.00)	9.05	--	8.59	8.67	8.58	9.58	10.25
3.31 (3.00)	9.06	--	--	8.79	8.71	9.60	10.29
4.41 (4.00)	9.09	--	--	8.89	8.84	9.64	10.33
5.51 (5.00)	9.13	8.71	8.79	--	8.98	9.69	10.38
6.61 (6.00)	9.17	8.78	8.86	9.04	9.12	9.73	10.42
7.72 (7.00)	9.20	8.85	8.93	9.13	9.21	9.77	10.45
8.82 (8.00)	9.23	8.93	9.02	9.24	9.32	9.80	10.48
9.92 (9.00)	9.25	9.03	9.12	9.37	9.46	9.82	10.50
11.02 (10.00)	9.27	9.14	9.23	9.52	9.61	9.84	10.51
12.13 (11.00)	9.28	9.25	9.35	9.66	9.75	9.85	10.52
13.23 (12.00)	9.25	9.33	9.42	9.75	9.86	9.85	10.52
14.33 (13.00)	9.22	9.41	9.49	9.83	--	9.81	10.52
15.43 (14.00)	9.17	9.48	9.55	9.90	9.91	9.77	10.47
16.53 (15.00)	9.13	9.54	9.60	9.95	9.93	9.72	10.43
17.64 (16.00)	9.08	9.60	9.64	10.00	9.91	9.68	10.38
18.74 (17.00)	9.04	9.64	9.68	10.03	9.88	9.63	10.33
19.84 (18.00)	8.99	9.68	9.71	9.99	9.85	9.58	--
20.94 (19.00)	8.94	9.64	9.71	9.95	9.80	--	--
22.05 (20.00)	--	9.60	9.66	--	--	--	--
23.15 (21.00)	8.85	9.56	9.61	--	--	9.43	10.13
24.25 (22.00)	--	9.51	9.56	9.80	9.66	--	10.08
25.35 (23.00)	8.75	9.46	--	--	--	9.33	--
26.46 (24.00)	8.70	--	--	9.71	9.57	9.28	9.98
27.56 (25.00)	8.65	9.36	9.40	9.67	9.53	9.23	9.93
33.07 (30.00)	8.21	9.12	9.15	9.41	9.34	8.93	9.70
38.58 (35.00)	7.55	8.90	8.92	9.09	9.05	8.27	9.17
38.85 (35.24)	7.51	8.87	8.90	9.07	9.03	8.24	9.13
44.09 (40.00)	6.82	8.38	8.38	8.62	8.59	7.62	8.52
49.60 (45.00)	5.63	7.85	7.84	8.03	7.99	6.63	7.85

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9553	Lat. 9554	Lat. 9555	Lat. 9556	Lat. 9557	Lat. 9558
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	6.94	6.89	7.13	7.14	5.17	6.67
55.50 (50.35)	--	6.82	6.77	7.03	7.03	5.04	6.56
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.22	5.25	5.62	5.62	--	5.03
61.77 (56.04)	--	4.86	--	--	--	--	--
61.83 (56.09)	--	--	4.86	--	--	--	--
62.29 (56.51)	--	--	--	--	--	--	4.49
63.07 (57.22)	--	--	--	--	4.85	--	--
63.11 (57.25)	--	--	--	4.84	--	--	--

Table 16.3-7 MAPLHGR Limits

Bundle Type: GE14-P10DNAB391-16GZ-100T-145-T6-3376 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9559	Lat. 9560	Lat. 9561	Lat. 9562	Lat. 9557	Lat. 9563
0.00 (0.00)	9.41	8.51	8.74	8.74	8.65	9.81	10.40
0.22 (0.20)	9.33	8.55	8.77	8.77	8.69	9.76	10.37
1.10 (1.00)	9.12	8.62	--	8.85	8.77	9.61	10.30
2.20 (2.00)	9.05	8.70	8.90	8.96	8.88	9.58	10.29
3.31 (3.00)	9.06	8.78	8.97	9.07	9.01	9.60	10.33
4.41 (4.00)	9.09	8.87	9.05	9.16	9.14	9.64	10.37
5.51 (5.00)	9.13	8.96	9.12	9.25	9.27	9.69	10.41
6.61 (6.00)	9.17	9.05	9.20	9.35	9.42	9.73	10.45
7.72 (7.00)	9.20	9.14	9.29	9.45	9.55	9.77	10.49
8.82 (8.00)	9.23	9.24	--	9.56	9.66	9.80	10.51
9.92 (9.00)	9.25	9.33	9.46	9.66	9.76	9.82	10.53
11.02 (10.00)	9.27	9.41	9.53	9.75	9.86	9.84	10.55
12.13 (11.00)	9.28	9.51	9.61	--	9.97	9.85	10.55
13.23 (12.00)	9.25	--	9.68	9.97	10.09	9.85	10.56
14.33 (13.00)	9.22	9.65	9.74	10.06	10.13	9.81	10.56
15.43 (14.00)	9.17	--	9.80	10.13	10.09	9.77	10.51
16.53 (15.00)	9.13	9.80	9.86	10.20	10.13	9.72	10.46
17.64 (16.00)	9.08	9.87	9.91	10.17	10.12	9.68	10.42
18.74 (17.00)	9.04	9.93	9.95	10.09	10.07	9.63	10.37
19.84 (18.00)	8.99	9.97	9.98	--	--	9.58	--
20.94 (19.00)	8.94	10.00	10.00	9.98	9.95	--	--
22.05 (20.00)	--	9.97	9.97	--	--	--	--
23.15 (21.00)	8.85	9.93	9.92	--	--	9.43	10.17
24.25 (22.00)	--	9.88	--	9.80	9.76	--	--
25.35 (23.00)	8.75	--	--	9.74	--	9.33	10.07
26.46 (24.00)	8.70	--	9.77	9.68	9.64	9.28	10.02
27.56 (25.00)	8.65	9.72	9.72	9.62	9.59	9.23	9.97
33.07 (30.00)	8.21	9.48	9.48	9.36	9.32	8.93	9.74
38.58 (35.00)	7.55	9.22	9.22	9.16	9.12	8.27	9.22
38.85 (35.24)	7.51	9.19	9.20	9.14	9.10	8.24	9.19
44.09 (40.00)	6.82	8.78	8.79	8.75	8.70	7.62	8.57
49.60 (45.00)	5.63	8.19	8.20	8.27	8.22	6.63	7.92

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9559	Lat. 9560	Lat. 9561	Lat. 9562	Lat. 9557	Lat. 9563
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.26	7.27	7.39	7.40	5.17	6.75
55.50 (50.35)	--	7.16	7.17	7.29	7.30	5.04	6.63
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.77	5.80	5.96	5.96	--	5.13
62.54 (56.74)	--	--	--	--	--	--	4.51
63.36 (57.48)	--	4.89	--	--	--	--	--
63.50 (57.61)	--	--	4.88	5.06	5.06	--	--
63.51 (57.62)	--	--	4.88	--	--	--	--
64.05 (58.11)	--	--	--	--	4.89	--	--
64.10 (58.15)	--	--	--	4.87	--	--	--

Table 16.3-8 MAPLHGR Limits

Bundle Type: GE14-P10DNAB391-15GZ-100T-145-T6-3377 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9564	Lat. 9565	Lat. 9566	Lat. 9567	Lat. 9557	Lat. 9568
0.00 (0.00)	9.41	8.52	8.53	8.48	8.39	9.81	10.33
0.22 (0.20)	9.33	8.56	8.57	8.53	8.44	9.76	10.31
1.10 (1.00)	9.12	8.64	8.64	8.62	8.53	9.61	10.23
2.20 (2.00)	9.05	8.74	8.74	8.75	8.66	9.58	10.22
3.31 (3.00)	9.06	--	--	8.89	8.81	9.60	10.26
4.41 (4.00)	9.09	8.91	8.92	9.00	8.96	9.64	10.30
5.51 (5.00)	9.13	9.00	9.01	9.11	9.12	9.69	10.34
6.61 (6.00)	9.17	9.09	9.10	9.23	9.29	9.73	10.38
7.72 (7.00)	9.20	9.19	9.20	9.35	9.44	9.77	10.42
8.82 (8.00)	9.23	9.28	9.29	9.47	9.57	9.80	10.45
9.92 (9.00)	9.25	9.38	9.39	9.58	9.68	9.82	10.47
11.02 (10.00)	9.27	9.46	9.47	9.70	9.80	9.84	10.48
12.13 (11.00)	9.28	9.56	9.57	9.83	9.94	9.85	10.49
13.23 (12.00)	9.25	9.63	9.65	9.96	10.08	9.85	10.49
14.33 (13.00)	9.22	9.70	9.72	10.06	10.11	9.81	10.49
15.43 (14.00)	9.17	--	9.79	10.15	10.11	9.77	10.44
16.53 (15.00)	9.13	9.85	9.87	10.22	10.15	9.72	10.40
17.64 (16.00)	9.08	9.91	9.93	10.17	10.14	9.68	10.35
18.74 (17.00)	9.04	9.96	9.97	10.10	10.08	9.63	10.30
19.84 (18.00)	8.99	10.00	10.00	10.04	--	9.58	--
20.94 (19.00)	8.94	10.02	10.02	--	--	--	--
22.05 (20.00)	--	9.98	9.98	--	--	--	--
23.15 (21.00)	8.85	9.93	--	9.86	9.83	9.43	10.10
24.25 (22.00)	--	--	--	--	9.77	--	--
25.35 (23.00)	8.75	--	9.82	9.74	--	9.33	10.00
26.46 (24.00)	8.70	9.77	--	--	9.65	9.28	9.95
27.56 (25.00)	8.65	9.72	9.72	9.63	9.59	9.23	9.90
33.07 (30.00)	8.21	9.48	9.48	9.37	9.33	8.93	9.67
38.58 (35.00)	7.55	9.22	9.22	9.17	9.12	8.27	9.13
38.85 (35.24)	7.51	9.19	9.20	9.15	9.10	8.24	9.10
44.09 (40.00)	6.82	8.78	8.78	8.75	8.70	7.62	8.48
49.60 (45.00)	5.63	8.19	8.20	8.26	8.16	6.63	7.80

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9564	Lat. 9565	Lat. 9566	Lat. 9567	Lat. 9557	Lat. 9568
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.26	7.26	7.38	7.38	5.17	6.62
55.50 (50.35)	--	7.15	7.16	7.28	7.28	5.04	6.51
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.77	5.78	5.94	5.94	--	4.97
62.11 (56.35)	--	--	--	--	--	--	4.48
63.41 (57.53)	--	4.88	--	--	--	--	--
63.42 (57.53)	--	--	4.88	--	--	--	--
63.50 (57.61)	--	--	--	5.04	5.04	--	--
63.99 (58.05)	--	--	--	--	4.89	--	--
64.04 (58.09)	--	--	--	4.87	--	--	--

Table 16.3-9 MAPLHGR Limits

Bundle Type: GE14-P10DNAB391-12GZ-100T-145-T6-3378 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9569	Lat. 9570	Lat. 9571	Lat. 9572	Lat. 9557	Lat. 9573
0.00 (0.00)	9.41	8.94	8.95	8.98	8.90	9.81	10.12
0.22 (0.20)	9.33	8.97	8.98	9.01	8.93	9.76	10.09
1.10 (1.00)	9.12	--	9.04	9.08	9.00	9.61	9.99
2.20 (2.00)	9.05	9.09	9.10	9.18	9.11	9.58	9.99
3.31 (3.00)	9.06	9.16	--	9.28	9.22	9.60	10.02
4.41 (4.00)	9.09	9.22	9.23	9.38	9.34	9.64	10.07
5.51 (5.00)	9.13	9.28	9.30	9.46	9.47	9.69	10.12
6.61 (6.00)	9.17	9.35	9.37	9.55	9.60	9.73	10.16
7.72 (7.00)	9.20	9.42	9.44	9.63	9.70	9.77	10.20
8.82 (8.00)	9.23	9.50	9.51	9.73	9.79	9.80	10.23
9.92 (9.00)	9.25	9.57	9.59	9.82	--	9.82	10.25
11.02 (10.00)	9.27	9.64	9.65	9.89	10.00	9.84	10.27
12.13 (11.00)	9.28	9.70	9.72	9.98	10.09	9.85	10.27
13.23 (12.00)	9.25	9.76	9.78	10.08	10.20	9.85	10.28
14.33 (13.00)	9.22	9.80	9.82	10.14	10.17	9.81	10.26
15.43 (14.00)	9.17	--	9.87	10.19	10.13	9.77	10.22
16.53 (15.00)	9.13	9.89	9.91	10.23	10.15	9.72	10.17
17.64 (16.00)	9.08	9.93	9.95	10.26	10.13	9.68	10.12
18.74 (17.00)	9.04	9.96	9.97	10.25	10.10	9.63	10.07
19.84 (18.00)	8.99	9.98	9.99	10.21	10.05	9.58	--
20.94 (19.00)	8.94	10.00	10.00	10.16	10.01	--	9.97
22.05 (20.00)	--	9.98	9.98	--	--	--	--
23.15 (21.00)	8.85	9.93	--	--	9.91	9.43	9.87
24.25 (22.00)	--	--	--	10.02	--	--	--
25.35 (23.00)	8.75	--	--	--	9.82	9.33	9.77
26.46 (24.00)	8.70	9.77	9.77	9.92	--	9.28	9.72
27.56 (25.00)	8.65	9.72	9.72	--	9.73	9.23	9.67
33.07 (30.00)	8.21	9.48	9.48	9.65	9.53	8.93	9.43
38.58 (35.00)	7.55	9.21	9.22	9.38	9.37	8.27	8.83
38.85 (35.24)	7.51	9.19	9.20	9.37	9.35	8.24	8.80
44.09 (40.00)	6.82	8.79	8.80	8.98	8.94	7.62	8.18
49.60 (45.00)	5.63	8.21	8.21	8.42	8.41	6.63	7.39

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 9552	Lat. 9569	Lat. 9570	Lat. 9571	Lat. 9572	Lat. 9557	Lat. 9573
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.28	7.29	7.39	7.40	5.17	6.21
55.50 (50.35)	--	7.18	7.18	7.29	7.30	5.04	6.08
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.81	5.82	5.97	5.97	--	--
60.70 (55.06)	--	--	--	--	--	--	4.38
63.50 (57.61)	--	4.90	4.91	5.06	5.06	--	--
63.64 (57.74)	--	4.85	--	--	--	--	--
63.66 (57.75)	--	--	4.86	--	--	--	--
64.05 (58.10)	--	--	--	--	4.89	--	--
64.09 (58.14)	--	--	--	4.88	--	--	--

Table 16.3-10 MAPLHGR Limits

Bundle Type: GE14-P10DNAB392-17GZ-100T-145-T6-2932 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 7357	Lat. 7364	Lat. 7365	Lat. 7366	Lat. 7367	Lat. 7368	Lat. 7369
0.00 (0.00)	9.41	8.36	8.56	8.61	8.52	9.81	10.52
0.22 (0.20)	9.33	8.41	8.61	8.66	8.57	9.75	10.50
1.10 (1.00)	9.12	8.50	8.69	8.76	8.70	9.61	10.43
2.20 (2.00)	9.06	8.62	8.80	8.90	8.88	9.58	10.43
3.31 (3.00)	9.08	8.75	8.92	9.05	9.07	9.61	10.46
4.41 (4.00)	9.11	8.88	9.04	9.20	9.25	9.65	10.51
5.51 (5.00)	9.15	9.01	9.16	9.35	9.43	9.70	10.55
6.61 (6.00)	9.19	9.14	9.27	9.48	9.57	9.74	10.58
7.72 (7.00)	9.23	9.28	9.38	9.64	9.74	9.78	10.61
8.82 (8.00)	9.25	9.40	9.51	9.81	9.92	9.81	10.64
9.92 (9.00)	9.28	9.52	9.65	9.98	10.09	9.83	10.66
11.02 (10.00)	9.29	9.65	9.78	10.13	10.18	9.85	10.67
12.13 (11.00)	9.31	9.77	9.90	10.26	10.23	9.86	10.68
13.23 (12.00)	9.28	9.85	9.98	10.35	10.28	9.86	10.68
14.33 (13.00)	9.24	9.92	10.02	10.34	10.26	9.82	10.68
15.43 (14.00)	9.20	9.97	10.05	10.26	10.20	9.78	10.64
16.53 (15.00)	9.16	10.01	10.06	10.23	10.18	9.73	10.60
18.74 (17.00)	9.06	10.05	10.06	10.11	10.06	9.64	10.50
22.05 (20.00)	8.92	10.05	10.05	9.94	9.90	9.49	10.36
27.56 (25.00)	8.68	10.04	10.04	9.65	9.62	9.25	10.12
33.07 (30.00)	8.24	9.76	9.84	9.39	9.36	8.95	9.89
38.58 (35.00)	7.58	9.46	9.48	9.14	9.13	8.29	9.40
38.85 (35.24)	7.55	9.43	9.46	9.12	9.10	8.26	9.37
44.09 (40.00)	6.87	8.93	8.94	8.59	8.58	7.64	8.75
49.60 (45.00)	5.68	8.38	8.39	8.03	8.02	6.66	8.11
54.79 (49.71)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.30	7.32	7.14	7.13	5.21	7.00
55.50 (50.35)	--	7.19	7.22	7.05	7.04	5.08	6.89
58.16 (52.77)	--	--	--	--	--	4.21	--
60.63 (55.00)	--	5.83	5.86	5.86	5.85	--	5.47
63.40 (57.52)	--	--	--	--	--	--	4.57
63.50 (57.61)	--	4.91	4.95	5.14	5.13	--	--

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 7357	Lat. 7364	Lat. 7365	Lat. 7366	Lat. 7367	Lat. 7368	Lat. 7369
63.57 (57.67)	--	4.89	--	--	--	--	--
63.70 (57.79)	--	--	4.88	--	--	--	--
64.44 (58.46)	--	--	--	--	4.90	--	--
64.48 (58.50)	--	--	--	4.89	--	--	--

Table 16.3-11 MAPLHGR Limits

Bundle Type: GE14-P10DNAB372-17GZ-100T-145-T6-4175 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10786	Lat. 10787	Lat. 10788	Lat. 10789	Lat. 10790	Lat. 10791
0.00 (0.00)	9.41	8.34	8.67	8.69	8.64	9.81	10.39
0.22 (0.20)	9.33	8.38	8.70	8.75	8.70	9.76	10.37
1.10 (1.00)	9.12	8.45	8.76	8.86	8.79	9.61	10.30
2.20 (2.00)	9.05	8.54	8.85	8.98	8.90	9.58	10.31
3.31 (3.00)	9.06	8.65	8.95	9.08	9.01	9.60	10.34
4.41 (4.00)	9.09	8.76	--	9.19	9.12	9.64	--
5.51 (5.00)	9.13	8.87	9.17	9.31	9.24	9.69	10.43
6.61 (6.00)	9.17	8.99	9.27	9.43	9.37	9.73	10.47
7.72 (7.00)	9.20	9.12	9.38	9.56	9.51	9.77	10.51
8.82 (8.00)	9.23	9.25	9.49	9.69	9.65	9.80	10.53
9.92 (9.00)	9.25	9.39	9.61	9.83	9.80	9.82	10.55
11.02 (10.00)	9.27	9.51	9.73	9.97	9.96	9.84	10.57
12.13 (11.00)	9.28	9.63	9.85	10.10	10.13	9.85	10.58
13.23 (12.00)	9.25	9.70	9.95	10.18	10.21	9.85	10.58
14.33 (13.00)	9.22	9.75	10.00	10.20	10.09	9.81	10.58
15.43 (14.00)	9.17	9.81	10.02	10.11	9.93	9.77	10.54
16.53 (15.00)	9.13	9.88	10.03	10.05	9.89	9.72	10.49
17.64 (16.00)	9.08	9.83	9.94	10.00	9.85	9.68	10.44
18.74 (17.00)	9.04	9.78	9.84	9.95	--	9.63	10.39
19.84 (18.00)	8.99	9.74	9.77	--	--	9.58	--
20.94 (19.00)	8.94	9.71	9.71	9.85	9.71	--	10.29
22.05 (20.00)	--	9.66	--	--	--	--	--
23.15 (21.00)	8.85	--	9.61	9.76	9.62	9.43	10.19
25.35 (23.00)	8.75	--	9.50	9.67	9.53	9.33	10.09
26.46 (24.00)	8.70	--	--	--	9.49	9.28	10.05
27.56 (25.00)	8.65	9.42	9.41	9.58	9.45	9.23	10.00
33.07 (30.00)	8.21	9.20	9.19	9.39	9.26	8.93	9.77
38.58 (35.00)	7.55	9.03	9.01	9.18	9.12	8.27	9.25
38.85 (35.24)	7.51	9.01	8.99	9.15	9.10	8.24	9.22
44.09 (40.00)	6.82	8.54	8.54	8.73	8.68	7.62	8.60
49.60 (45.00)	5.63	8.04	8.05	8.19	8.14	6.63	7.96
54.64 (49.57)	3.98	--	--	--	--	--	--

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10786	Lat. 10787	Lat. 10788	Lat. 10789	Lat. 10790	Lat. 10791
55.12 (50.00)	--	7.19	7.22	7.40	7.39	5.17	6.79
55.50 (50.35)	--	7.09	7.13	7.32	7.30	5.04	6.68
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.77	5.85	6.23	6.20	--	5.19
62.69 (56.87)	--	--	--	--	--	--	4.52
63.44 (57.55)	--	4.88	--	--	--	--	--
63.50 (57.61)	--	--	4.93	5.33	5.39	--	--
63.70 (57.79)	--	--	4.87	--	--	--	--
64.88 (58.86)	--	--	--	4.91	--	--	--
65.11 (59.07)	--	--	--	--	4.93	--	--

Table 16.3-12 MAPLHGR Limits

Bundle Type: GE14-P10DNAB386-16GZ-100T-145-T6-4176 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10792	Lat. 10793	Lat. 10794	Lat. 10795	Lat. 10790	Lat. 10796
0.00 (0.00)	9.41	8.48	8.82	8.88	8.83	9.81	10.51
0.22 (0.20)	9.33	8.52	8.85	8.91	8.89	9.76	10.49
1.10 (1.00)	9.12	8.58	8.90	8.97	8.97	9.61	10.41
2.20 (2.00)	9.05	--	8.96	9.06	9.07	9.58	10.41
3.31 (3.00)	9.06	--	9.03	9.14	9.18	9.60	10.43
4.41 (4.00)	9.09	8.82	9.11	9.23	9.29	9.64	10.47
5.51 (5.00)	9.13	8.90	--	9.32	9.41	9.69	10.51
6.61 (6.00)	9.17	8.98	9.24	9.40	9.51	9.73	10.54
7.72 (7.00)	9.20	9.06	9.31	9.49	9.60	9.77	10.57
8.82 (8.00)	9.23	9.15	9.38	9.58	9.69	9.80	10.60
9.92 (9.00)	9.25	9.24	9.46	9.67	9.78	9.82	10.62
11.02 (10.00)	9.27	9.33	9.53	9.77	--	9.84	10.63
12.13 (11.00)	9.28	9.43	9.61	9.86	9.98	9.85	10.64
13.23 (12.00)	9.25	9.48	9.67	9.95	10.07	9.85	10.64
14.33 (13.00)	9.22	9.54	9.71	10.01	10.04	9.81	10.64
15.43 (14.00)	9.17	9.61	--	10.07	10.08	9.77	10.60
16.53 (15.00)	9.13	--	9.80	10.11	10.11	9.72	10.55
17.64 (16.00)	9.08	9.75	9.84	10.14	10.09	9.68	10.50
18.74 (17.00)	9.04	9.81	9.87	10.16	10.06	9.63	10.46
19.84 (18.00)	8.99	9.86	9.89	10.16	10.01	9.58	--
20.94 (19.00)	8.94	9.89	9.91	--	9.96	--	--
22.05 (20.00)	--	9.88	9.91	--	--	--	--
23.15 (21.00)	8.85	9.84	9.89	--	9.86	9.43	10.26
24.25 (22.00)	--	9.78	--	9.96	--	--	10.21
25.35 (23.00)	8.75	--	9.78	--	9.77	9.33	10.16
26.46 (24.00)	8.70	9.68	--	9.86	9.72	9.28	--
27.56 (25.00)	8.65	9.63	9.68	9.80	9.68	9.23	10.07
33.07 (30.00)	8.21	9.39	9.41	9.54	--	8.93	9.83
38.58 (35.00)	7.55	9.14	9.14	9.29	9.27	8.27	9.34
38.85 (35.24)	7.51	9.12	9.12	9.27	9.25	8.24	9.31
44.09 (40.00)	6.82	8.69	8.71	8.92	8.85	7.62	8.69
49.60 (45.00)	5.63	8.12	8.13	8.36	8.34	6.63	8.05

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10792	Lat. 10793	Lat. 10794	Lat. 10795	Lat. 10790	Lat. 10796
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.22	7.28	7.68	7.54	5.17	6.91
55.50 (50.35)	--	7.11	7.17	7.58	7.45	5.04	6.80
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.62	5.70	6.26	6.36	--	5.36
62.89 (57.06)	--	4.89	--	--	--	--	--
63.11 (57.26)	--	--	--	--	--	--	4.55
63.16 (57.30)	--	--	4.89	--	--	--	--
63.50 (57.61)	--	--	--	5.33	5.51	--	--
64.67 (58.67)	--	--	--	4.95	--	--	--
65.28 (59.23)	--	--	--	--	4.98	--	--

Table 16.3-13 MAPLHGR Limits

Bundle Type: GE14-P10DNAB386-16GZ-100T-145-T6-4177 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10797	Lat. 10798	Lat. 10799	Lat. 10800	Lat. 10790	Lat. 10801
0.00 (0.00)	9.41	8.50	8.61	8.60	8.53	9.81	10.38
0.22 (0.20)	9.33	8.54	8.64	8.67	8.57	9.76	10.36
1.10 (1.00)	9.12	8.60	8.70	8.76	8.66	9.61	10.28
2.20 (2.00)	9.05	8.68	8.78	8.85	8.77	9.58	10.28
3.31 (3.00)	9.06	--	8.86	8.95	8.88	9.60	10.32
4.41 (4.00)	9.09	8.84	8.94	9.05	9.00	9.64	10.36
5.51 (5.00)	9.13	8.93	9.03	9.15	9.12	9.69	10.40
6.61 (6.00)	9.17	9.02	9.11	9.26	9.25	9.73	10.44
7.72 (7.00)	9.20	9.11	--	9.37	9.39	9.77	10.48
8.82 (8.00)	9.23	9.20	9.30	9.48	9.53	9.80	10.50
9.92 (9.00)	9.25	9.30	9.38	9.57	9.67	9.82	10.52
11.02 (10.00)	9.27	9.39	9.46	9.67	9.78	9.84	10.54
12.13 (11.00)	9.28	9.48	9.54	9.78	--	9.85	10.55
13.23 (12.00)	9.25	9.54	9.60	9.88	10.01	9.85	10.55
14.33 (13.00)	9.22	9.59	9.66	9.98	10.10	9.81	10.55
15.43 (14.00)	9.17	9.64	9.73	10.06	10.08	9.77	10.50
16.53 (15.00)	9.13	--	9.79	10.13	10.05	9.72	10.46
17.64 (16.00)	9.08	9.76	9.85	10.18	10.03	9.68	10.41
18.74 (17.00)	9.04	9.82	9.89	10.14	9.98	9.63	10.36
19.84 (18.00)	8.99	9.86	9.92	10.09	9.94	9.58	--
20.94 (19.00)	8.94	9.89	9.93	--	--	--	--
22.05 (20.00)	--	9.88	9.90	--	--	--	--
23.15 (21.00)	8.85	9.84	--	9.94	9.79	9.43	10.16
24.25 (22.00)	--	9.79	--	--	--	--	--
25.35 (23.00)	8.75	--	9.74	9.84	9.70	9.33	10.06
26.46 (24.00)	8.70	--	--	9.80	9.66	9.28	10.01
27.56 (25.00)	8.65	9.64	9.63	--	9.62	9.23	9.96
33.07 (30.00)	8.21	9.40	9.39	9.53	9.42	8.93	9.73
38.58 (35.00)	7.55	9.14	9.14	9.29	9.26	8.27	9.21
38.85 (35.24)	7.51	9.12	9.12	9.27	9.24	8.24	9.18
44.09 (40.00)	6.82	8.69	8.70	8.91	8.84	7.62	8.56
49.60 (45.00)	5.63	8.12	8.12	8.34	8.29	6.63	7.91

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10797	Lat. 10798	Lat. 10799	Lat. 10800	Lat. 10790	Lat. 10801
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.23	7.25	7.66	7.59	5.17	6.73
55.50 (50.35)	--	7.12	7.14	7.56	7.51	5.04	6.62
58.07 (52.68)	--	--	--	--	--	4.20	--
60.63 (55.00)	--	5.65	5.68	6.23	6.45	--	5.11
62.49 (56.69)	--	--	--	--	--	--	4.51
63.02 (57.17)	--	4.88	--	--	--	--	--
63.12 (57.26)	--	--	4.88	--	--	--	--
63.50 (57.61)	--	--	--	5.30	5.53	--	--
64.64 (58.64)	--	--	--	4.94	--	--	--
65.26 (59.20)	--	--	--	--	4.96	--	--

Table 16.3-14 MAPLHGR Limits

Bundle Type: GE14-P10DNAB389-11GZ-100T-145-T6-4178 (GE14C)

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10802	Lat. 10803	Lat. 10804	Lat. 10805	Lat. 10790	Lat. 10806
0.00 (0.00)	9.41	9.03	9.03	8.99	8.94	9.81	10.09
0.22 (0.20)	9.33	9.04	9.05	9.05	9.01	9.76	10.06
1.10 (1.00)	9.12	9.09	9.10	9.16	9.11	9.61	9.96
2.20 (2.00)	9.05	9.15	9.16	9.30	9.25	9.58	9.95
3.31 (3.00)	9.06	9.21	9.23	9.42	9.40	9.60	9.99
4.41 (4.00)	9.09	9.28	9.30	9.51	9.51	9.64	10.04
5.51 (5.00)	9.13	9.35	9.37	9.59	9.63	9.69	10.08
6.61 (6.00)	9.17	9.41	9.45	9.68	9.76	9.73	10.13
7.72 (7.00)	9.20	9.49	9.52	9.77	9.88	9.77	10.16
8.82 (8.00)	9.23	9.56	9.60	9.87	9.98	9.80	10.19
9.92 (9.00)	9.25	9.64	--	--	10.08	9.82	10.22
11.02 (10.00)	9.27	9.71	9.76	10.06	10.17	9.84	10.23
12.13 (11.00)	9.28	9.79	9.83	10.14	10.26	9.85	10.24
13.23 (12.00)	9.25	9.86	9.89	10.20	10.26	9.85	10.25
14.33 (13.00)	9.22	--	--	10.23	10.21	9.81	10.23
15.43 (14.00)	9.17	--	9.93	10.24	--	9.77	10.18
16.53 (15.00)	9.13	9.92	9.95	10.25	10.23	9.72	10.13
17.64 (16.00)	9.08	9.94	9.97	10.25	10.18	9.68	10.09
18.74 (17.00)	9.04	9.96	9.97	10.25	10.13	9.63	10.04
19.84 (18.00)	8.99	9.96	9.98	10.23	--	9.58	--
20.94 (19.00)	8.94	9.97	9.97	--	10.03	--	--
22.05 (20.00)	--	9.94	9.97	--	--	--	--
23.15 (21.00)	8.85	--	9.94	10.08	9.93	9.43	9.83
24.25 (22.00)	--	9.84	--	--	--	--	9.78
25.35 (23.00)	8.75	--	9.82	9.98	9.83	9.33	9.73
26.46 (24.00)	8.70	9.73	--	9.93	9.79	9.28	9.68
27.56 (25.00)	8.65	9.68	9.72	9.88	9.74	9.23	9.64
33.07 (30.00)	8.21	9.43	9.46	9.67	9.54	8.93	9.40
38.58 (35.00)	7.55	9.16	9.19	9.42	9.36	8.27	8.79
38.85 (35.24)	7.51	9.14	9.16	9.40	9.34	8.24	8.76
44.09 (40.00)	6.82	8.71	8.71	9.02	8.92	7.62	8.14
49.60 (45.00)	5.63	8.13	8.12	8.43	8.41	6.63	7.33

Average Planar Exposure	MAPLHGR Limit (kW/ft)						
GWd/MT (GWd/ST)	Lat. 10785	Lat. 10802	Lat. 10803	Lat. 10804	Lat. 10805	Lat. 10790	Lat. 10806
54.64 (49.57)	3.98	--	--	--	--	--	--
55.12 (50.00)	--	7.36	7.32	7.77	7.62	5.17	6.13
55.50 (50.35)	--	7.25	7.21	7.67	7.54	5.04	6.00
58.07 (52.68)	--	--	--	--	--	4.20	--
60.50 (54.88)	--	--	--	--	--	--	4.37
60.63 (55.00)	--	5.84	5.84	6.42	6.46	--	--
63.50 (57.61)	--	4.91	4.92	5.49	5.58	--	--
63.61 (57.71)	--	4.88	--	--	--	--	--
63.63 (57.72)	--	--	4.88	--	--	--	--
65.22 (59.17)	--	--	--	4.94	--	--	--
65.83 (59.72)	--	--	--	--	4.86	--	--

The core monitoring system monitors LHGR limits and ECCS-LOCA MAPLHGR limits separately; therefore, the new ECCS-LOCA MAPLHGR limits shown in Reference 1 for GE14C in Section 16.4 are unaffected by changes to the LHGR curve, and application of the GE14L-B36-G7-lMLTR LHGR curve is acceptable from the ECCS-LOCA perspective.

The single loop operation multiplier on MAPLHGR and the ECCS-LOCA analytical initial MCPR values applicable to GE14C fuel type in the new cycle core are shown in the following table.

Table 16.3-15 Initial MCPR and Single Loop Operation Multiplier on MAPLHGR

Fuel Type	Initial MCPR	Single Loop Operation Multiplier on MAPLHGR
GE14C	1.350	0.83

The GE14C SLO multiplier applies to the EPU operating domain.

Monticello has an ECCS-LOCA PLHGR of 11.62 kW/ft for GE14C fuel type.

16.4 References

The SAFER/GESTR-LOCA analysis base reports applicable to the new cycle core are listed below.

References for GE14C

1. *Project Task Report Nuclear Management Company, LLC (NMC) Monticello Nuclear Generating Plant Extended Power Uprate Task T0407: ECCS-LOCA SAFER/GESTR*, GE-NE-0000-0060-9286-TR-R2, Revision 2, October 2011.

2. *Monticello Nuclear Plant GE14 ECCS-LOCA Evaluation with the RHR Intertie Line Open*, NSA 01-459, October 10, 2001.

```
52                                          5  6  9  9  6  5
50                                          11 9  10 10 9  11
48                        9  9  7  8  10  3  13 13 14 10 8  7  9  9
46                        9  9  15 15 20  18 18 18 18 20 15 15 9  9
44                  6  7  11 14 20 18 19  18 12 12 18 19 18 20 14 11 9  5
42                  9  10 13 20 10 18 15  12 17 17 12 15 18 10 20 13 10 9
40            9  9  11 13 7  18 19 14 17  7  15 15 7  17 14 19 18 7  13 11 9  9
38            9  9  14 20 18 15 14 17 15 17  8  8  17 15 17 14 15 18 20 14 1  9
36            7  15 20 10 19 14 10 13 17 10  12 12 10 17 13 10 14 19 10 20 15 7
34            8  15 18 18 14 17 13 7  13 17  7  7  17 13 7  13 17 14 18 18 15 8
32    5  11 10 20 19 15 17 15 17 13 17 12  19 19 12 17 13 17 15 17 15 19 20 10 11 5
30    6  9  14 18 18 12 7  17 10 17 12 17  13 13 17 12 17 10 17 7  12 18 18 14 9  6
28    9  10 13 18 12 17 15 8  12 7  19 13  7  7  13 19 7  12 8  15 17 12 18 13 10 9
26    9  10 13 18 12 17 15 8  12 7  19 13  7  7  13 19 7  12 8  15 17 12 18 13 10 9
24    6  9  14 18 18 12 7  17 10 17 12 17  13 13 17 12 17 10 17 7  12 18 18 14 9  16
22    5  11 10 20 19 15 17 15 17 13 17 12  19 19 12 17 13 17 15 17 15 19 20 10 11 5
20          8  15 18 18 14 17 13 7  13 17  7  7  17 13 7  13 17 14 18 18 15 8
18          7  15 20 10 19 14 10 13 17 10  12 12 10 17 13 10 14 19 10 20 15 7
16          9  2  14 20 18 15 14 17 15 17  8  8  17 15 17 14 15 18 20 14 9  9
14          9  9  11 13 7  18 19 14 17 7   15 15 7  17 14 19 18 7  13 11 9  9
12                9  10 13 20 10 18 15 12  17 17 12 15 18 10 20 13 10 9
10                6  7  11 14 20 18 19 18  12 12 18 19 18 20 14 11 7  6
 8                      9  9  15 15 20 18  18 18 18 20 15 15 9  9
 6                      9  9  7  8  10 14  13 13 3  10 8  7  9  9
 4                                  11 9  10 10 9  11
 2                                  5  6  9  9  6  5

      1  3  5  7  9  11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
```

Fuel Type			
1=GE14-P10DNAB392-16GZ-100T-145-T6-2931	(Cycle 25)	12=GE14-P10DNAB373-16GZ-100T-145-T6-3375	(Cycle 26)
2=GE14-P10DNAB375-16GZ-100T-145-T6-3101	(Cycle 25)	13=GE14-P10DNAB391-16GZ-100T-145-T6-3376	(Cycle 26)
3=GE14-P10DNAB391-15GZ-100T-145-T6-3377	(Cycle 26)	14=GE14-P10DNAB391-15GZ-100T-145-T6-3377	(Cycle 26)
5=GE14-P10DNAB392-16GZ-100T-145-T6-2931	(Cycle 24)	15=GE14-P10DNAB391-12GZ-100T-145-T6-3378	(Cycle 26)
6=GE14-P10DNAB392-17GZ-100T-145-T6-2932	(Cycle 24)	16=GE14-P10DNAB392-17GZ-100T-145-T6-2932	(Cycle 24)
7=GE14-P10DNAB392-16GZ-100T-145-T6-2931	(Cycle 25)	17=GE14-P10DNAB372-17GZ-100T-145-T6-4175	(Cycle 27)
8=GE14-P10DNAB424-14GZ-100T-145-T6-3100	(Cycle 25)	18=GE14-P10DNAB386-16GZ-100T-145-T6-4176	(Cycle 27)
9=GE14-P10DNAB375-16GZ-100T-145-T6-3101	(Cycle 25)	19=GE14-P10DNAB386-16GZ-100T-145-T6-4177	(Cycle 27)
10=GE14-P10DNAB392-16GZ-100T-145-T6-3102	(Cycle 25)	20=GE14-P10DNAB389-11GZ-100T-145-T6-4178	(Cycle 27)
11=GE14-P10DNAB391-12GZ-100T-145-T6-3103	(Cycle 25)		

Figure 1 Reference Core Loading Pattern

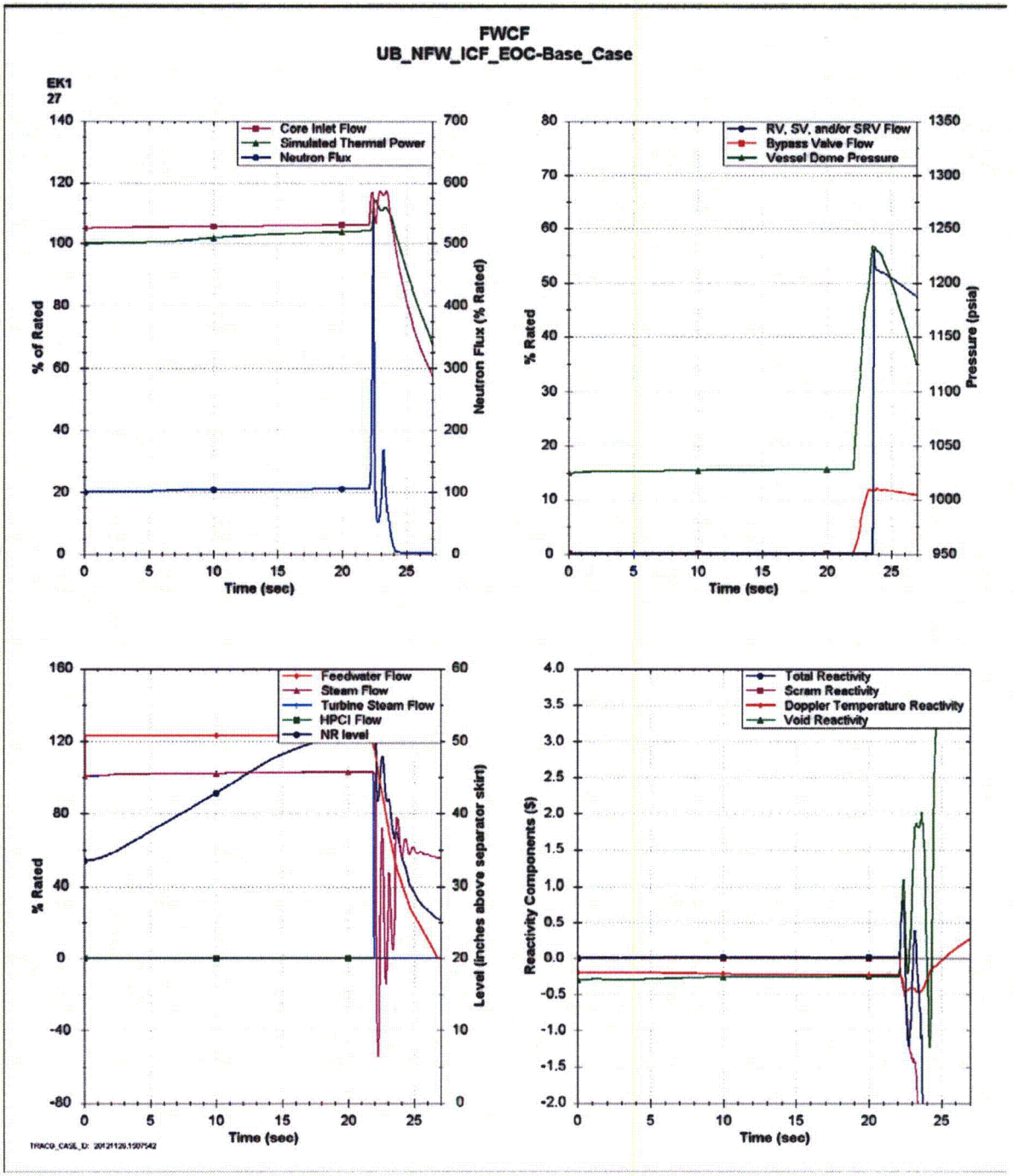

Figure 2 Plant Response to FW Controller Failure
(EOC ICF (UB))

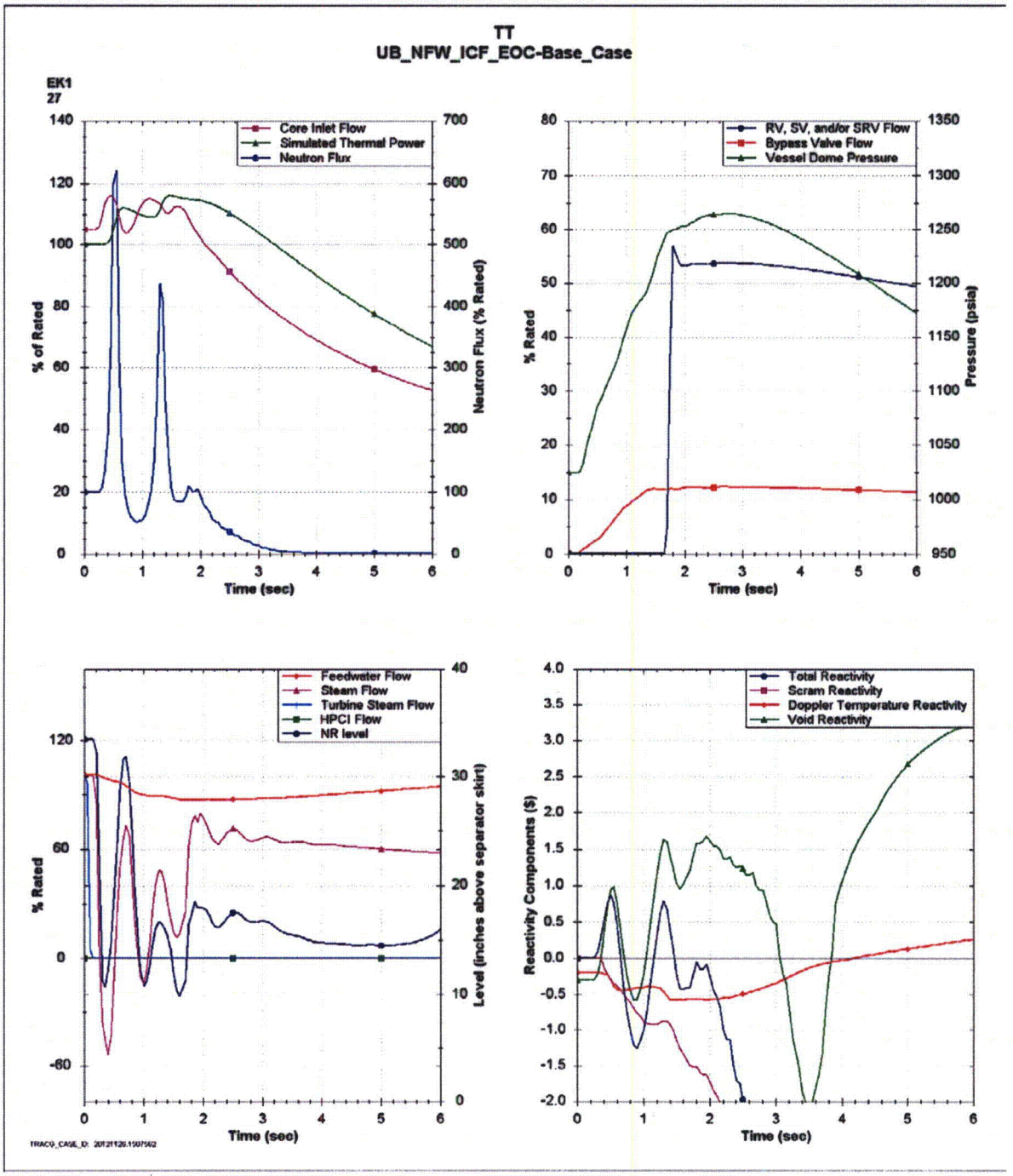

Figure 3 Plant Response to Turbine Trip with Bypass
(EOC ICF (UB))

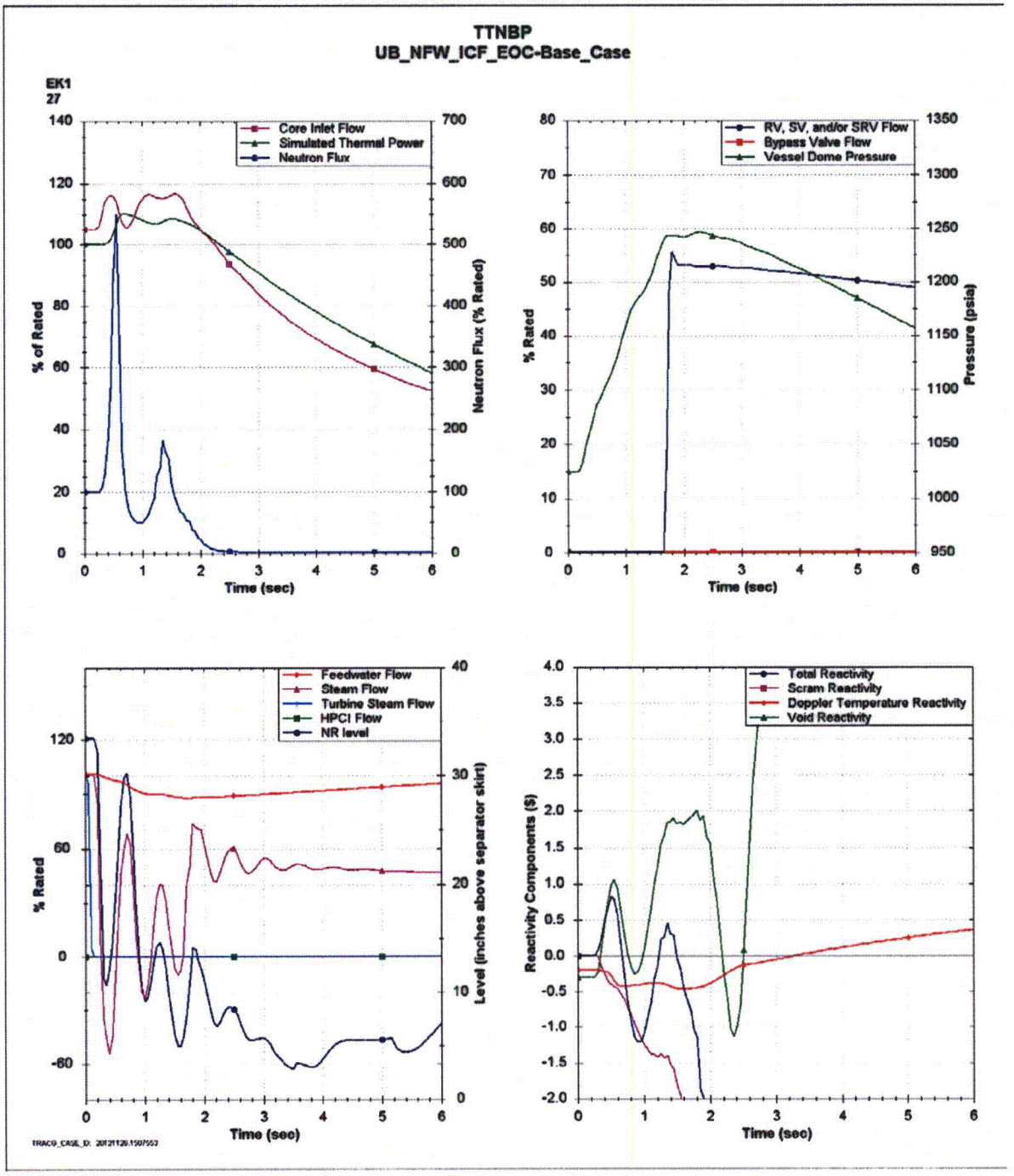

Figure 4 Plant Response to Turbine Trip w/o Bypass
(EOC ICF (UB))

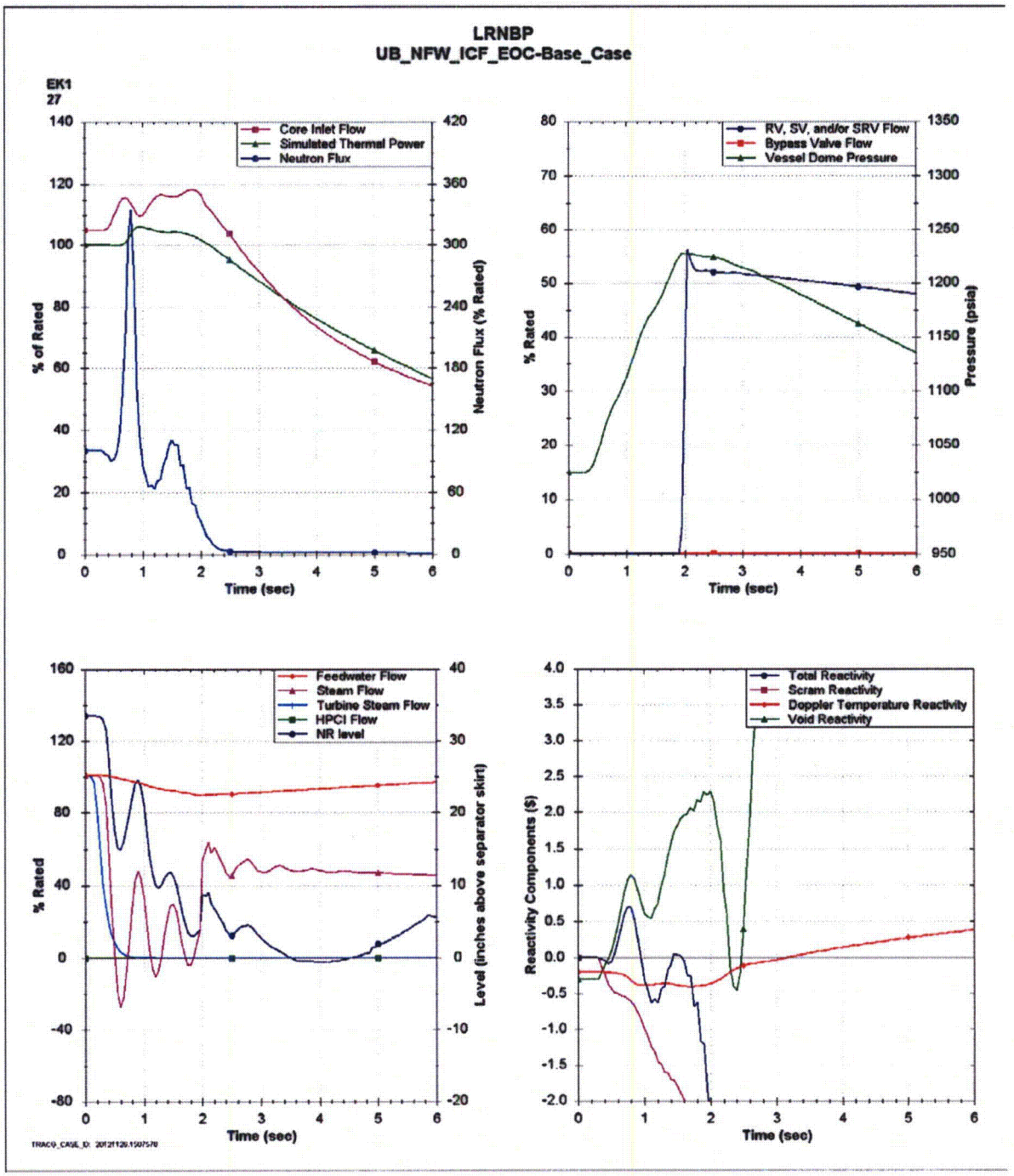

Figure 5 Plant Response to Load Rejection w/o Bypass
(EOC ICF (UB))

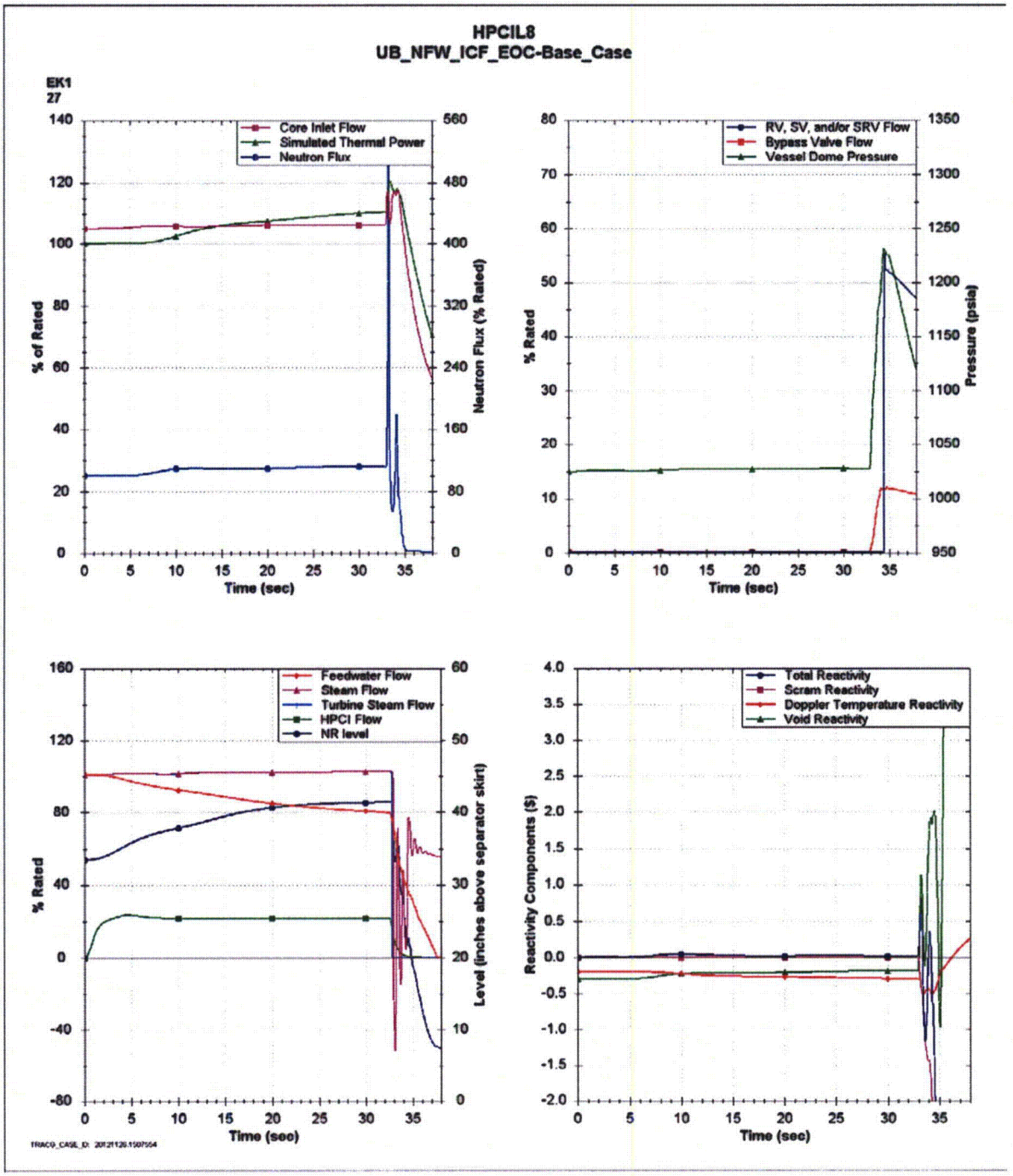

Figure 6 Plant Response to Inadvertent HPCI /L8
(EOC ICF (UB))

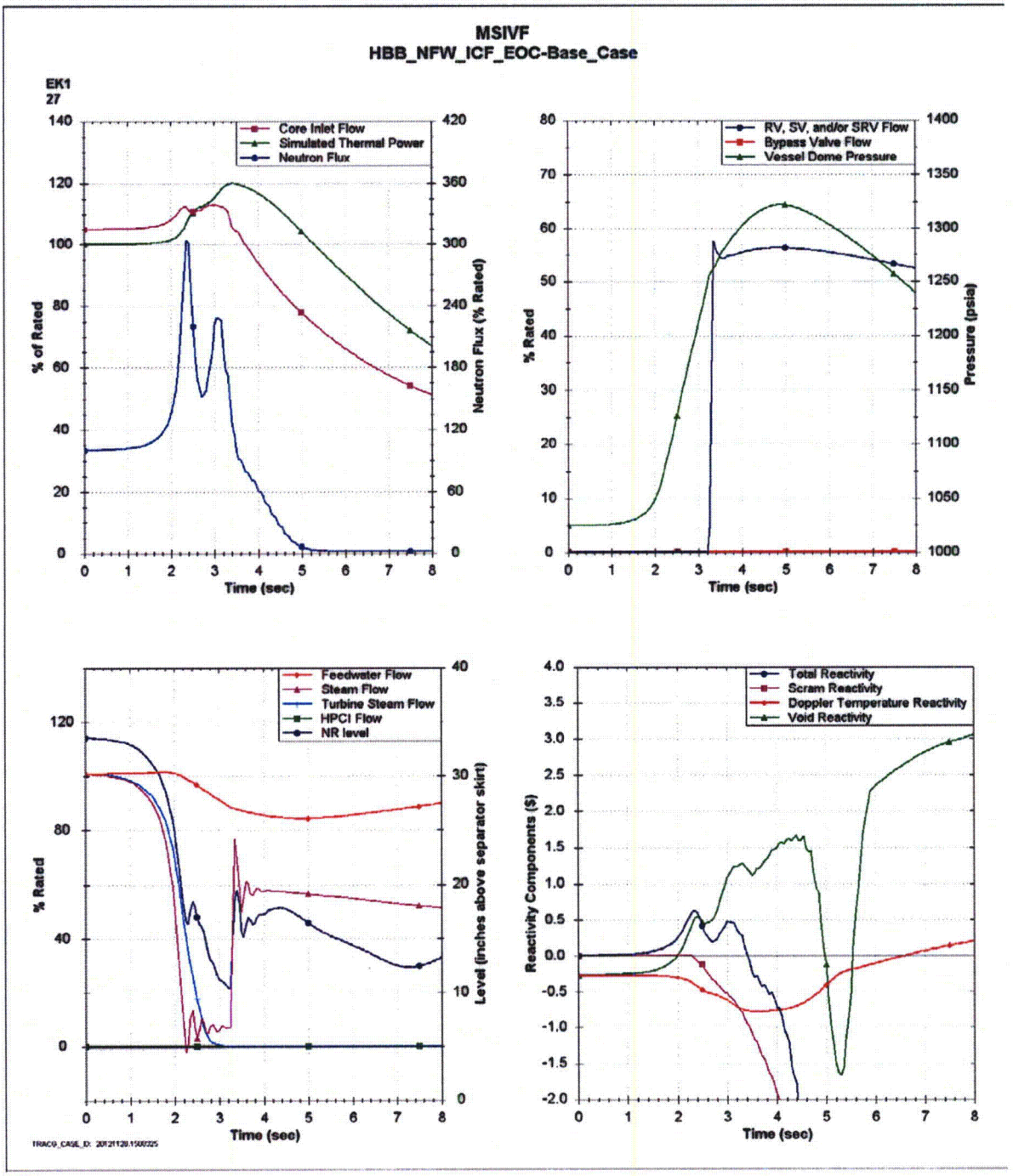

Figure 7 Plant Response to MSIV Closure (Flux Scram) – (EOC ICF (HBB))

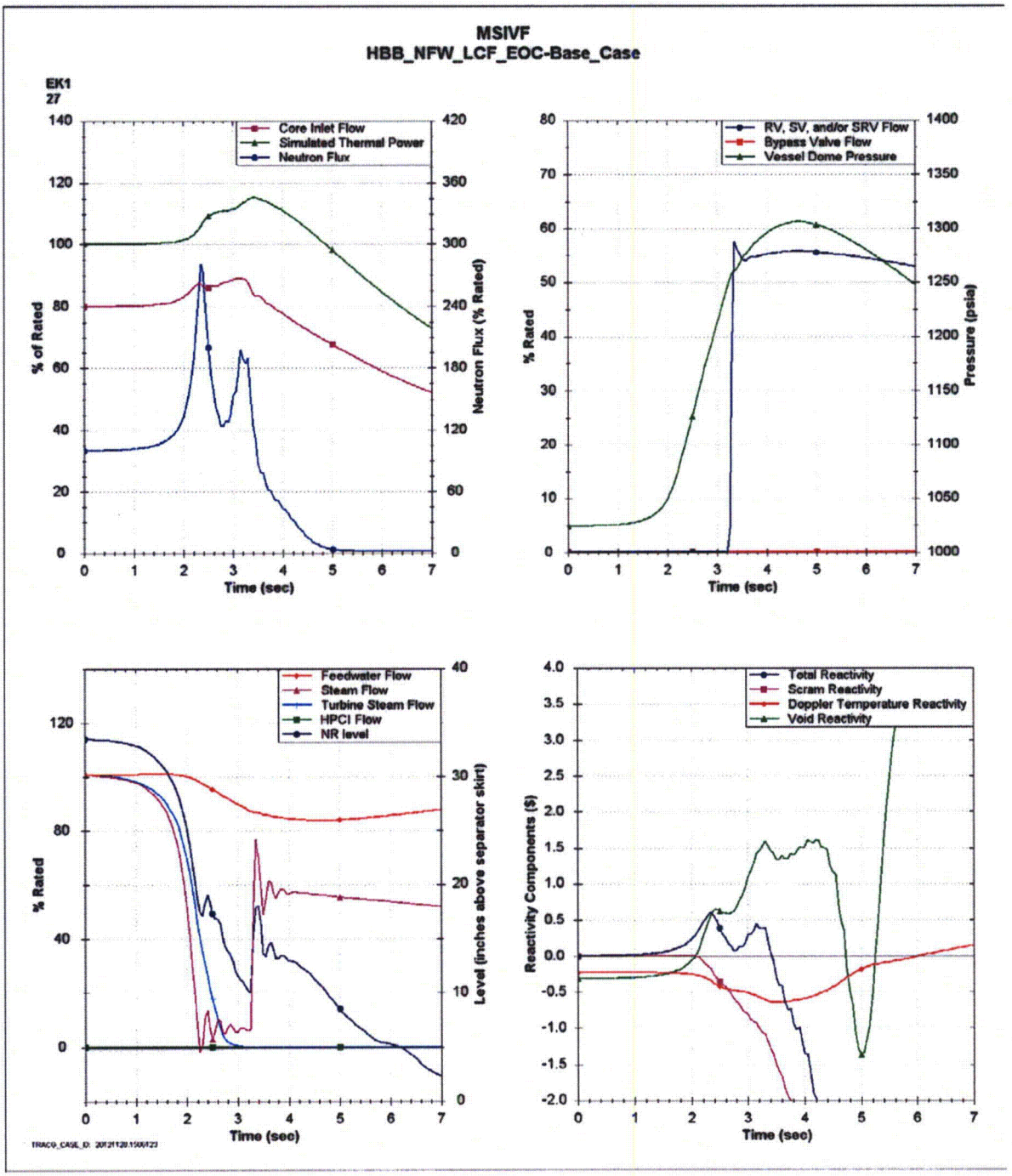

Figure 8 Plant Response to MSIV Closure (Flux Scram) – (EOC LCF (HBB))

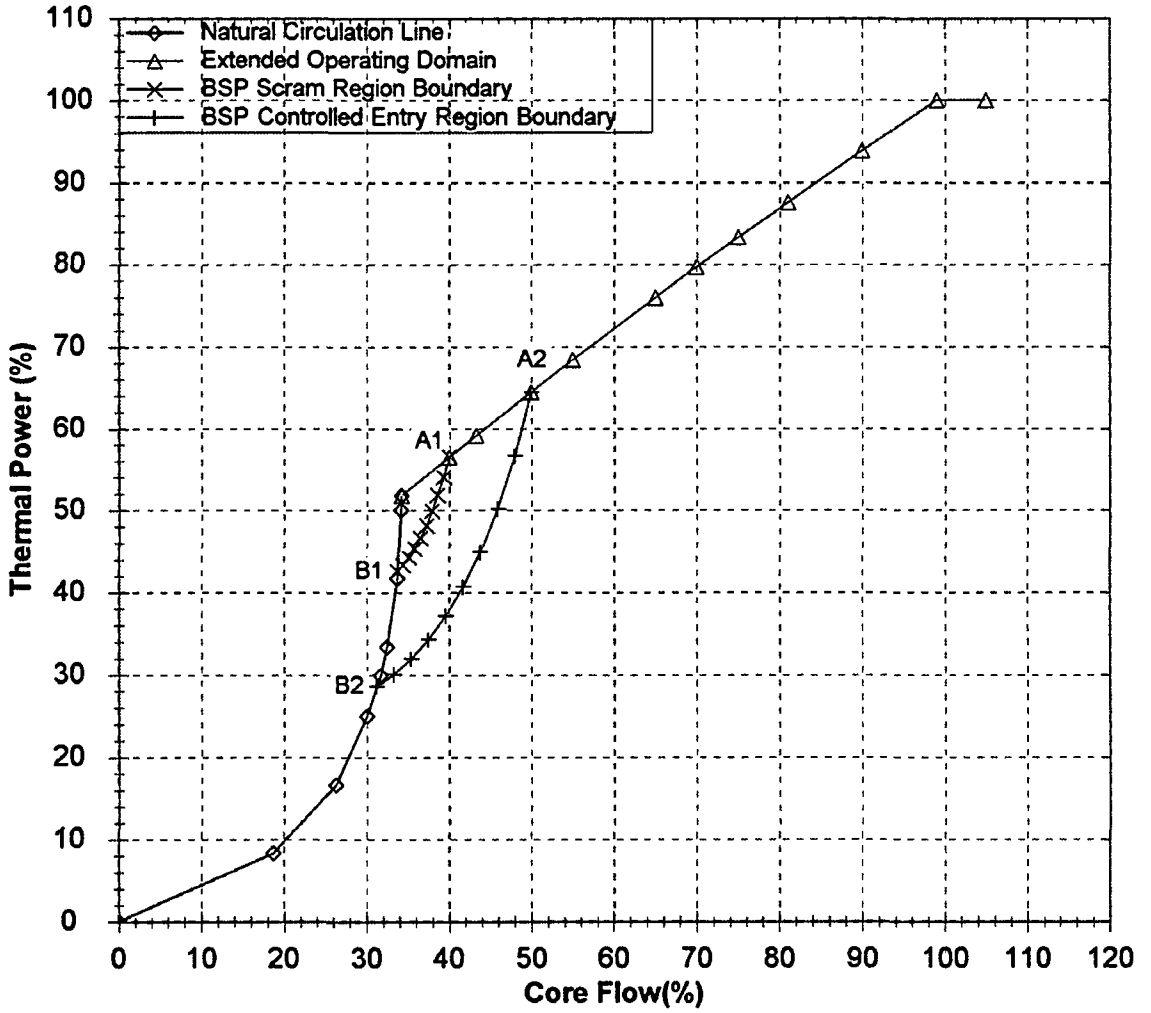

Figure 9 BSP Region Boundaries

Appendix A
Analysis Conditions

The reactor operating conditions used in the reload licensing analysis for this plant and cycle are presented in Table A-1. The pressure relief and safety valve configuration for this plant are presented in Table A-2. Additionally, the operating flexibility options listed in Section 8 are supported by the reload licensing analysis.

Table A-1 Reactor Operating Conditions

Parameter	Analysis Value	
	ICF NFWT	LCF[16] NFWT
Thermal power, MWt	2004.0	2004.0
Core flow, Mlb/hr	60.5	46.1
Reactor pressure (core mid-plane), psia	1041.0	1036.3
Inlet enthalpy, Btu/lb	524.8	517.1
Non-fuel power fraction[17]	NA	NA
Steam flow, Mlb/hr	8.39	8.39
Dome pressure, psig	1010.2	1009.8
Turbine pressure, psig	943.9	943.7

Table A-2 Pressure Relief and Safety Valve Configuration

Valve Type	Number of Valves	Lowest Setpoint (psig)
Safety/Relief Valve	8	1170 (Relief Mode)

[16] The low core flow analysis condition used a bounding core flow value.
[17] The non-fuel power fraction is not available from TRACG04

Appendix B
Thermal-Mechanical Compliance

A thermal-mechanical compliance check is performed to assure that the fuel will operate without violating the thermal-mechanical design limits. These limits are designed such that reactor operation within these limits provides assurance that the fuel will not exceed any thermal-mechanical design or licensing limits during all modes of operation. The fuel thermal-mechanical limits are met for the current cycle.

Appendix C
Decrease in Core Coolant Temperature Event

The Loss-of-Feedwater Heating event was analyzed at 100% rated power using the BWR Simulator Code. The use of this code is consistent with the approved methodology. The transient plots, neutron flux and heat flux values normally reported in Section 9 are not an output of the BWR Simulator Code; therefore, those items are not included in this document. The OLMCPR result is shown in Section 11.

Appendix D
Off-Rated Limits

Off-Rated Power Dependent Limits

ARTS power dependent thermal limits have been developed for operation with all Equipment In-Service and a Pressure Regulator Out-Of-Service (PROOS) in Reference D-1.

The MCPRp limits provided in Reference D-1 are based on a SLMCPR of 1.15.

MCPRp Limits for: **Base Case**			
Limits for Power < 40.0%			
Flow > 50.0%		**Flow ≤ 50.0%**	
Power (%)	**Limit** *MCPRp*	**Power (%)**	**Limit** *MCPRp*
25.0	3.62	25.0	2.83
40.0	2.91	40.0	2.37
Limits for Power ≥ 40.0%			
Power (%)		**Limit** *Kp*	
40.0		1.323	
60.0		1.150	
90.0		1.056	
100.0		1.000	

MCPRp Limits for: **Pressure Regulator Out-of-Service**			
Limits for Power < 40.0%			
Flow > 50.0%		**Flow ≤ 50.0%**	
Power (%)	**Limit** *MCPRp*	**Power (%)**	**Limit** *MCPRp*
25.0	3.62	25.0	2.83
40.0	2.91	40.0	2.37
Limits for Power ≥ 40.0%			
Power (%)		**Limit** *Kp*	
40.0		1.550	
60.0		1.460	
85.0		1.240	
85.0		1.072	
90.0		1.056	
100.0		1.000	

LHGRFACp/MAPFACp Limits for: **Base Case**			
Limits for Power < 40.0%			
Flow > 50.0%		**Flow ≤ 50.0%**	
Power (%)	**Limit**	**Power (%)**	**Limit**
25.0	0.496	25.0	0.522
40.0	0.519	40.0	0.638
Limits for Power ≥ 40.0%			
Power (%)		**Limit**	
40.0		0.687	
100.0		1.000	

LHGRFACp/MAPFACp Limits for: **Pressure Regulator Out-of-Service**			
Limits for Power < 40.0%			
Flow > 50.0%		**Flow ≤ 50.0%**	
Power (%)	**Limit**	**Power (%)**	**Limit**
25.0	0.496	25.0	0.522
40.0	0.519	40.0	0.638
Limits for Power ≥ 40.0%			
Power (%)		**Limit**	
40.0		0.645	
85.0		0.825	
85.0		0.894	
100.0		1.000	

Off-Rated Flow Dependent Limits

The flow dependent ARTS MCPR limits are documented in Reference D-1. The flow dependent LHGRFAC/MAPFAC limits are documented in Reference D-2. The off-rated flow dependent limits provided in References D-1 and D-2 have been validated for this cycle.

The MCPRf limits provided in Reference D-1 are based on a SLMCPR of 1.15.

MCPRf Limits for: **Base Case**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit** *MCPRf*
30.0	1.64
94.4	1.23
107.0	1.23

MCPRf Limits for: **Pressure Regulator Out-of-Service**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit** *MCPRf*
30.0	1.64
94.4	1.23
107.0	1.23

LHGRFACf Limits for: **Base Case**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit**
30.0	0.660
80.0	1.000
107.0	1.000

LHGRFACf Limits for: **Pressure Regulator Out-of-Service**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit**
30.0	0.660
80.0	1.000
107.0	1.000

MAPFACf Limits for: **Base Case**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit**
30.0	0.660
80.0	1.000
107.0	1.000

MAPFACf Limits for: **Pressure Regulator Out-of-Service**	
Limits for a Maximum Runout Flow of 107.0%	
Flow (%)	**Limit**
30.0	0.660
80.0	1.000
107.0	1.000

References

D-1 *Monticello Nuclear Generating Plant Offrated Limits and Pressure Regulator Downscale Failure Analysis at MELLLA+*, 0000-0131-4356-R1, Revision 1, January 2012.

D-2 *Monticello Nuclear Generating Plant Offrated Limits and Pressure Regulator Downscale Failure Analysis at EPU*, 0000-0108-2960-R0, Revision 0, November 2009.

Appendix E
Mislocated Fuel Loading Error

The Monticello Nuclear Generating Plant Cycle 27 Mislocated Fuel Loading Error analysis was evaluated. The event is non-limiting for fuel types through GE14 if the following condition is satisfied:

$$OLMCPR_{plant/cycle} \geq 1.28 \times (SLMCPR_{plant/cycle} / 1.07)$$

This criterion has been demonstrated to be generically applicable to GE14 reloads.

The minimum OLMCPR calculated for Monticello Cycle 27 is 1.62 (shown in Section 11 for GE14 fuel from BOC27 to EOC27) while the plant/cycle specific SLMCPR is 1.15. Using 1.15 in the equation yields 1.38 on the right side.

Using these values the above equation would yield $1.62 \geq 1.38$.

Therefore, the Mislocated Fuel Loading Error is non-limiting for Monticello Cycle 27.

Appendix F
Turbine Trip with Bypass and Degraded Scram

The Turbine Trip with Bypass (TTWBP) event was analyzed with the postulated Option A degraded scram and an OLMCPR value was determined. No Option B analysis was performed for the TTWBP. The Option A calculated OLMCPR for the TTWBP is used for Option B and this value sets the OLMCPR limit for Option B because it is higher than the most limiting OLMCPR calculated for a pressurization event. Therefore, if the cycle average scram time does not satisfy the criterion provided in Reference F-1 and Monticello Nuclear Generating Plant decides to interpolate between Option A and Option B scram times, this can be accomplished by using the procedure provided in Reference F-1 with the following modification to Equation 4 of Reference F-1:

The modified equation to establish the new operating limit for pressurization events is given below:

$$OLMCPR_{New} = MAX\left(OLMCPR_{Option\ B} + \frac{\tau_{ave} - \tau_B}{\tau_A - \tau_B} \Delta OLMCPR, OLMCPR_{TTWBP} \right) \quad (4)$$

where: τ_{ave} and τ_B are defined in Equations 1 and 3 of Reference F-1, respectively;

τ_A = the technical specification limit on core average scram time to the 20 percent insertion position

OLMCPR Option B = the most limiting OLMCPR calculated for a pressurization event actually analyzed for Option B

ΔOLMCPR = the difference between OLMCPR Option A and OLMCPR Option B

For Monticello Cycle 27, the OLMCPRs for the HPCIL8 event are 1.74 for Option A and 1.54 for Option B. Therefore, the ΔOLMCPR for the HPCIL8 event is 0.20. The OLMCPR for the TTWBP event is 1.62.

This approach is cycle independent with the TTWBP analyzed in this manner as long as the cycle specific OLMCPR Option B and ΔOLMCPR values are used in the calculation.

References

F-1. *Monticello Option B Licensing Basis*, LRC03.040, March 24, 2003 from L. R. Conner to Rick Rohrer.

Appendix G
Monticello Non-Standard SRLR Items

This appendix contains Monticello non-standard SRLR items that are being provided at the request of Xcel Energy.

Additional Section 9 Information

For the inadvertent HPCI event, the level 8 trip was modeled as the OPL-3 setpoint value. The turbine trip signal is initiated manually after the narrow-range water level has reached equilibrium. This was done since confirmation could not be obtained that a level 8 event would not occur during this event.

Additional Section 11 Information

The following table summarizes the cycle rated power and flow MCPR values for the events reported in this SRLR. If the event's Option A or Option B limit are merged together in a single column, then the event cannot be interpolated based on scram times. For a description of how to implement Option B scram times see Appendix F.

Cycle MCPR values **Exposure range: BOC27 to EOC27**		
	Option A	**Option B**
	GE14C	**GE14C**
FW Controller Failure	Not Limiting	Not Limiting
Load Reject w/o Bypass	Not Limiting	Not Limiting
Turbine Trip w/o Bypass	Not Limiting	Not Limiting
Inadvertent HPCI /L8 Turbine Trip	1.74	1.54
Loss of Feedwater Heating	1.34	
Fuel Loading Error (misoriented)	1.37	
Fuel Loading Error (mislocated)	Determined to be non-limiting	
SLO Pump Seizure	1.45	
Turbine Trip with Bypass	1.62	
Control Rod Withdrawal Error (RBM setpoint at 114%)	1.40	
Load Rejection with Bypass[18]	Determined to be non-limiting	
LOCA Analysis Limit MCPR	1.35	

[18] This event corresponds to "Single Turbine Control Valve Slow Closure (GESIL 502)". Since Cycle 22 results for this event were far from limiting and no significant changes have occurred that would significantly increase this event's results for this cycle, this event was determined to be non-limiting.

Additional Section 12 Information

The Dome Pressure Safety Limit, provided via the OPL-3, of 1332.0 psig is satisfied.

Additional Section 16 Information

These analyses indicate that plant operation up to 376 MWt with the RHR intertie line open is acceptable from an ECCS performance standpoint, provided a MAPLHGR multiplier of 0.75 is implemented or that the peak bundle power does not exceed 3.9 MWt.

The power and flow dependent LHGRFAC multipliers are sufficient to provide adequate protection for the off-rated conditions from an ECCS-LOCA analysis perspective and there is no need for additional MAPFAC multipliers for the ECCS-LOCA evaluation.

No single-loop operation multiplier on PLHGR is required.

Maximum Subcritical Banked Withdrawal Position (MSBWP)

The Maximum Subcritical Banked Withdrawal Position analysis confirmed that the reference core loading pattern satisfied cold shutdown margin requirements including bank position 04.

Appendix H
TRACG04 AOO Supplementary Information

Reference H-1 provides the results of the evaluations supporting the application of TRACG04 for AOO analyses for Monticello. Section 11 of this report presents the MCPR limits based on the TRACG04 methodology of Reference H-2.

The safety evaluation report for licensing topical report NEDE-32906P (Reference H-2) concluded that the application of TRACG04 methods to AOO and overpressure transient analyses were acceptable subject to certain limitations and conditions. Several of these conditions request that additional, application-specific information be provided. The information provided below responds to these requests for the identified items.

Limitation/Condition 23 (Transient LHGR Limitation 3)

The Transient LHGR Limitation 3 specified in Reference H-2 requires that in order to account for the impact of void history bias, plant-specific EPU and MELLLA+ applications using either TRACG04 or ODYN will demonstrate an equivalent to 10 percent margin to the fuel centerline melt and the 1 percent cladding circumferential plastic strain acceptance criteria due to pellet-cladding mechanical interaction for all of the limiting AOO transient events, including equipment out-of-service. Limiting transients in this case, refers to transients where the void reactivity coefficient plays a significant role (such as pressurization events).

The analyses for Monticello Cycle 27 met the conditions of the Void Reactivity Coefficient Correction Model Condition (Limitation 21 of Reference H-2) and the Void Reactivity Coefficient Correction Model Basis Condition (Limitation 22 of Reference H-2); and therefore per Limitation 23 of Reference H-2, the pressurization transient events are not required to demonstrate 10 percent margin to the fuel centerline melt and the 1 percent cladding circumferential plastic strain acceptance criteria.

References for Appendix H

H-1. *Monticello TRACG Implementation for Reload Licensing Transient Analysis*, 0000-0082-0062-R1, Revision 1, May 2010.

H-2. *Final Safety Evaluation of GE Hitachi Nuclear Energy Americas, LLC Licensing Topical Report NEDE-32906P, Supplement 3-A, "Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients"*, Revision 1, April 2010.

Appendix I
NEDC-33173P-A Supplementary Information

The safety evaluation for licensing topical report NEDC-33173P-A (Reference I-1) concluded that the application of GEH/GNF methods to expanded operating domains was acceptable subject to certain limitations and conditions. Several of these conditions request that additional, application-specific information be provided. The information provided below responds to these requests for the identified items.

Limitation/Condition 6 (R-factor)

The plant specific R-factor calculation at a bundle level was performed consistent with lattice axial void conditions expected for the hot channel operating state applicable to this cycle of operation. For Monticello Cycle 27 at the EPU licensed power level, a 60% void profile was used for the calculation of bundle R-factors.

Limitation/Condition 10 (Transient LHGR 2)

The Transient LHGR 2 limitation specified in Reference I-1 requires each EPU and MELLLA+ fuel reload to document the calculation results of the analyses demonstrating compliance to transient T-M acceptance criteria. Table I-1 summarizes the percent margin to the Thermal Overpower and Mechanical Overpower limits.

Table I-1 Margin to the Thermal Overpower and Mechanical Overpower Limits

Criteria	GE14C
Thermal Overpower	7.85%
Mechanical Overpower	7.91%

Limitation/Condition 11 (Transient LHGR 3)

The Transient LHGR 3 limitation specified in Reference I-1 requires that in order to account for the impact of the void history bias, plant-specific EPU and MELLLA+ applications using either TRACG04 or ODYN will demonstrate an equivalent to 10 percent margin to the fuel centerline melt and the 1 percent cladding circumferential plastic strain acceptance criteria due to pellet-cladding mechanical interaction for all of the limiting AOO transient events, including equipment out-of-service. Limiting transients in this case, refers to transients where the void reactivity coefficient plays a significant role (such as pressurization events).

However, as stated in Appendix H the void history bias was incorporated into the transient model within the TRACG04 code, and therefore the 10 percent margin to the fuel centerline melt and the 1 percent cladding circumferential plastic strain acceptance criteria is no longer required.

Limitation/Condition 14 (Part 21 Evaluation of GESTR-M Fuel Temperature Calculation)

GE14 LHGR limits applied to Monticello Cycle 27 EPU License incorporate a 350 psi penalty on fuel rod critical pressure in the fuel rod internal pressure design ratio. These limits comply with the NRC's conclusions regarding this subject (Reference I-2).

Limitation/Condition 17 (Steady State 5 Percent Bypass Voiding)

The bypass voiding condition was evaluated for the licensed core loading and confirmed that the bypass void fraction remained below 5 percent at all LPRM levels when operating at steady-state conditions within the licensed upper boundary. For a power/flow condition that conservatively bounded the licensed power/flow upper boundary, the bypass void fraction at the D level LPRM location was calculated to be 0.0%.

Limitation/Condition 19 (Void-Quality Correlation 1)

The OLMCPR limitation requiring an additional 0.01 adder on the OLMCPR does not apply to EPU or MELLLA+ licensing calculations when TRACG04 methods are used (Reference I-3). Therefore, the OLMCPR adder is not applied to Monticello Cycle 27.

References for Appendix I

I-1. *Applicability of GE Methods to Expanded Operating Domains, NEDC-33173P-A, Revision 4, November 2012.*

I-2. *Applicability of GE Methods to Expanded Operating Domains, NEDC-33173P-A, Revision 1, September 2010.*

I-3. *Final Safety Evaluation of GE Hitachi Nuclear Energy Americas, LLC Licensing Topical Report NEDE-32906P, Supplement 3-A, "Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for TRACG AOO and ATWS Overpressure Transients"*, Revision 1, April 2010.

Appendix J
List of Acronyms

Acronym	Description
ΔCPR	Delta Critical Power Ratio
Δk	Delta k-effective
2RPT (2PT)	Two Recirculation Pump Trip
ADS	Automatic Depressurization System
ADSOOS	Automatic Depressurization System Out of Service
AOO	Anticipated Operational Occurrence
APRM	Average Power Range Monitor
ARTS	APRM, Rod Block and Technical Specification Improvement Program
BOC	Beginning of Cycle
BSP	Backup Stability Protection
BWROG	Boiling Water Reactor Owners Group
COLR	Core Operating Limits Report
CPR	Critical Power Ratio
DIRPT	Delta MCPR over Initial MCPR for a two-Recirculation Pump Trip
DIVOM	Delta CPR over Initial MCPR vs. Oscillation Magnitude
DR	Decay Ratio
DS/RV	Dual Mode Safety/Relief Valve
ECCS	Emergency Core Cooling System
ELLLA	Extended Load Line Limit Analysis
EOC	End of Cycle (including all planned cycle extensions)
EOR	End of Rated (All Rods Out 100%Power / 100%Flow / NFWT)
EPU	Extended Power Uprate
ER	Exclusion Region
FFWTR	Final Feedwater Temperature Reduction
FMCPR	Final MCPR
FOM	Figure of Merit
FWCF	Feedwater Controller Failure
FWHOOS	Feedwater Heaters Out of Service
FWTR	Feedwater Temperature Reduction
GESTAR	General Electric Standard Application for Reactor Fuel
GETAB	General Electric Thermal Analysis Basis
GSF	Generic Shape Function
HAL	Haling Burn
HBB	Hard Bottom Burn
HBOM	Hot Bundle Oscillation Magnitude
HCOM	Hot Channel Oscillation Magnitude
HFCL	High Flow Control Line
HPCI	High Pressure Coolant Injection
HTSP	High Trip Set Point
ICA	Interim Corrective Action

Acronym	Description
ICF	Increased Core Flow
IMCPR	Initial MCPR
ITSP	Intermediate Trip Set Point
IVM	Initial Validation Matrix
Kf	Off-rated flow dependent OLMCPR multiplier
Kp	Off-rated power dependent OLMCPR multiplier
L8	Turbine Trip on high water level (Level 8)
LCF	Low Core Flow
LHGR	Linear Heat Generation Rate
LHGRFACf	Off-rated flow dependent LHGR multiplier
LHGRFACp	Off-rated power dependent LHGR multiplier
LOCA	Loss of Coolant Accident
LPRM	Local Power Range Monitor
LRHBP	Load Rejection with Half Bypass
LRNBP	Load Rejection without Bypass
LTR	Licensing Topical Report
LTSP	Low Trip Set Point
MAPFACf	Off-rated flow dependent MAPLHGR multiplier
MAPFACp	Off-rated power dependent MAPLHGR multiplier
MAPLHGR	Maximum Average Planar Linear Heat Generation Rate
MCPR	Minimum Critical Power Ratio
MCPRf	Off-rated flow dependent OLMCPR
MCPRp	Off-rated power dependent OLMCPR
MELLLA	Maximum Extended Load Line Limit Analysis
MELLLA+	MELLLA Plus
MOC	Middle of Cycle
MRB	Maximal Region Boundaries
MSF	Modified Shape Function
MSIV	Main Steam Isolation Valve
MSIVOOS	Main Steam Isolation Valve Out of Service
MSR	Moisture Separator Reheater
MSROOS	Moisture Separator Reheater Out of Service
MTU	Metric Ton Uranium
MWd	Megawatt day
MWd/ST	Megawatt days per Standard Ton
MWd/MT	Megawatt days per Metric Ton
MWt	Megawatt Thermal
N/A	Not Applicable
NBP	No Bypass
NCL	Natural Circulation Line
NFWT	Normal Feedwater Temperature
NOM	Nominal Burn
NTR	Normal Trip Reference
OLMCPR	Operating Limit MCPR
OOS	Out of Service

Acronym	Description
OPRM	Oscillation Power Range Monitor
Pbypass	Reactor power level below which the TSV position and the TCV fast closure scrams are bypassed
Pdome	Peak Dome Pressure
Psl	Peak Steam Line Pressure
Pv	Peak Vessel Pressure
PCT	Peak Clad Temperature
PHE	Peak Hot Excess
PLHGR	Peak Linear Heat Generation Rate
PLU	Power Load Unbalance
PLUOOS	Power Load Unbalance Out of Service
PRFDS	Pressure Regulator Failure Downscale
PROOS	Pressure Regulator Out of Service
Q/A	Heat Flux
RBM	Rod Block Monitor
RC	Reference Cycle
RCF	Rated Core Flow
RFWT	Reduced Feedwater Temperature
RPS	Reactor Protection System
RPT	Recirculation Pump Trip
RPTOOS	Recirculation Pump Trip Out of Service
RV	Relief Valve
RVM	Reload Validation Matrix
RWE	Rod Withdrawal Error
SC	Standard Cycle
SL	Safety Limit
SLMCPR	Safety Limit Minimum Critical Power Ratio
SLO	Single Loop Operation
SRLR	Supplemental Reload Licensing Report
S/RV (SRV)	Safety/Relief Valve
SRVOOS	Safety/Relief Valve(s) Out of Service
SS	Steady State
SSV	Spring Safety Valve
STU	Short Tons (or Standard Tons) of Uranium
TBV	Turbine Bypass Valve
TBVOOS	Turbine Bypass Valves Out of Service
TCV	Turbine Control Valve
TCVOOS	Turbine Control Valve Out of Service
TCVSC	Turbine Control Valve Slow Closure
TLO	Two Loop Operation
TRF	Trip Reference Function
TSIP	Technical Specifications Improvement Program
TSV	Turbine Stop Valve
TSVOOS	Turbine Stop Valve Out of Service
TT	Turbine Trip

Acronym	Description
TTHBP	Turbine Trip with Half Bypass
TTNBP	Turbine Trip without Bypass
UB	Under Burn