Exelon Generation®

Technical Specification 5.6.5

NMP2L 2668
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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-001

Nine Mile Point Nuclear Station, Unit 2
Renewed Facility Operating License No. NPF-69
NRC Docket No. 50-410

Subject: Core Operating Limits Report

Enclosed is a copy of the Core Operating Limits Report, Cycle 16, Revision 3, for Nine Mile Point Unit 2 (NMP2). This report is being submitted pursuant to NMP2 Technical Specification 5.6.5.d.

Should you have any questions regarding the information in this submittal, please contact Mr. John Darweesh at (315) 349-7444.

Sincerely,

Dennis M. Moore
Regulatory Assurance Manager, Nine Mile Point Nuclear Station
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DMM/KJK

Enclosure: Core Operating Limits Report for Nine Mile Point Unit 2, Cycle 16, Revision 3

cc: NRC Regional Administrator, Region I
NRC Project Manager
NRC Senior Resident Inspector

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NRR

Enclosure

Core Operating Limits Report

For

Nine Mile Point Unit 2, Cycle 16, Revision 3

CORE OPERATING LIMITS REPORT

FOR

NINE MILE POINT UNIT 2 CYCLE 16

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Revision History

Revision	Description
Revision 3	Revised to reflect measured scram time results for Equipment In Service and Turbine Bypass Valve Out Of Service options
Revision 2	New Issue for Cycle 16
Revision 1	Revised to reflect MELLLA+ Implementation
Revision 0	New Issue for Cycle 15

List of Tables

1.0 Terms and Definitions

ADSOOS	Automatic Depressurization System Out of Service
APLHGR	Average Planar Linear Heat Generation Rate
APRM	Average Power Range Monitor
ARTS	APRM and RBM Technical Specification Analysis
BPV	Bypass Valve
BSP	Backup Stability Protection
COLR	Core Operating Limits Report
CRD	Control Rod Drive
DLO	Dual Loop Operation
ECCS	Emergency Core Cooling System
EIS	Equipment In Service
ELLLA	Extended Load Line Limit Analysis
EOC	End of Cycle
EOC-RPT	See RPTOOS.
EOOS	Equipment Out of Service
EOR	End of Rated. The cycle exposure at which reactor power is equal to 100% rated (3988 MW_{th}), recirculation flow equal to 100% rated (108.5 Mlb/hr), and all control blades are fully withdrawn with equilibrium xenon.
FWHOOS	Feedwater Heater(s) Out of Service
GEH	General Electric-Hitachi
GNF	Global Nuclear Fuel
GPM	Gallons Per Minute
HFCL	High Flow Control Line
HTSP	High Trip Set Point (regarding RBM)
ICF	Increased Core Flow
INOP	Inoperable
ITSP	Intermediate Set Point (regarding RBM)
K_P	OLMCPR Multiplier
LCO	Limiting Condition for Operation
LHGR	Linear Heat Generation Rate
$LHGRFAC_F$	ARTS LHGR thermal limit flow dependent adjustments and multipliers
$LHGRFAC_P$	ARTS LHGR thermal limit power dependent adjustments and multipliers

LOCA	Loss of Coolant Accident
LTSP	Low Trip Set Point (regarding RBM)
$MAPFAC_F$	Off-rated flow dependent MAPLHGR multiplier
$MAPFAC_P$	Off-rated power dependent MAPLHGR multiplier
MAPLHGR	Maximum Average Planar Linear Heat Generation Rate
MCPR	Minimum Critical Power Ratio
$MCPR_F$	ARTS MCPR thermal limit flow dependent adjustments and multipliers
$MCPR_P$	ARTS MCPR thermal limit power dependent adjustments and multipliers
MELLLA	Maximum Extended Load Line Limit Analysis
MELLLA+	Maximum Extended Load Line Limit Analysis Plus
MSIV	Main Steam Isolation Valve
MSIVOOS	Main Steam Isolation Valve Out of Service
NCL	Natural Circulation Line
NRC	Nuclear Regulatory Commission
OLMCPR	Operating Limit MCPR
OPRM	Oscillation Power Range Monitor
PROOS	Pressure Regulator Out of Service
RDF	Recirculation Drive Flow
RPTOOS	Recirculation Pump Trip Out of Service; also known as EOC-RPT
RTP	Rated Thermal Power (3988 MW_t)
RBM	Rod Block Monitor
RWE	Rod Withdraw Error
SLMCPR	Safety Limit MCPR
SLO	Single Loop Operation
SRV	Safety Relief Valve
SRVOOS	Safety Relief Valve Out of Service
TBVOOS	Turbine Bypass Valve Out of Service
TS	Technical Specification

2.0 General Information

This report is prepared in accordance with Technical Specification 5.6.5 of Reference 1. Power and flow dependent limits are listed for various power and flow levels. Linear interpolation is to be used for intermediate values.

This report provides the values of the power distribution limits, control rod withdraw block instrumentation setpoints and stability protection setpoints for Nine Mile Point Unit 2 Cycle 16.

OPERATING LIMIT TECHNICAL SPECIFICATION REQUIREMENTS

Operating Limit	Requirement
APLHGR	Technical Specification LCO 3.2.1
MCPR	Technical Specification LCO 3.2.2
LHGR	Technical Specification LCO 3.2.3

This report provides the following cycle-specific parameter limits for Nine Mile Point Unit 2 CYCLE 16 (RELOAD 15):

- Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)
- Single Loop Operation (SLO) MAPLHGR multipliers
- Operating Limit Minimum Critical Power Ratio (OLMCPR)
- ARTS MCPR thermal limit adjustments and multipliers
- Single Loop Operation (SLO) MCPR adjustment
- Linear Heat Generation Rate (LHGR)
- ARTS LHGR thermal limit multipliers
- Single Loop Operation (SLO) LHGR multipliers
- Rod Block Monitor (RBM) Analytical Limits, Allowable Values and MCPR Limits
- Turbine Bypass Valve Parameters
- EOC Recirculation Pump Trip (EOC-RPT) Parameters
- Backup Stability Protection Parameters

Per TS 5.6.5, these values have been determined using NRC-approved methodology and are established such that all applicable limits of the plant safety analysis are met. The limits specified in this COLR support both DLO and SLO as required by TS LCO 3.4.1 and Main Turbine Bypass System inoperable as required by TS LCO 3.7.5.

The "BASE" thermal limit values shown in tables are for normal, equipment-in-service (EIS) two loop operation. Analysis also supports ICF for operational flexibility. Additional equipment out of service applicability can be found in Section 8.0, Modes of Operation.

The EIS and Turbine Bypass Valves Out-Of-Service (TBVOOS) for rated and off-rated conditions are based on measured scram times. The remainder of the rated and off-rated conditions are based on the improved scram time. The measured and improved scram time limits are both referred to as Option B.

The data presented in this report is valid for all licensed operating domains on the operating map, including (Reference 2):

- Maximum Extended Load Line Limit Analysis Plus to a minimum core flow of 85% of rated.
- Increased Core Flow up to 105% rated (Rated Core Flow is 108.5 Mlb/hr).
- Extended Power Uprate to 3988 MW_{th}.

3.0 MAPLHGR Limits

The Maximum Average Planar Linear Heat Generation Rate limits, in $\frac{KW}{ft}$, obtained from the ECCS analysis are provided in Table 3-1 and Table 3-2. The limiting MAPLHGR value for the most limiting lattice of each fuel type as a function of exposure is given. For SLO, a multiplier is used as shown in Table 3-3.

Table 3-1
MAPLHGR Versus Average Planar Exposure
GE14C
(Reference 2 – Table 16.3-1)

Average Planar Exposure [GWD/ST]	MAPLHGR Limit [KW/ft]
0.00	12.82
14.51	12.82
19.13	12.82
57.61	8.00
63.50	5.00

Table 3-2
MAPLHGR Versus Average Planar Exposure
GNF2
(Reference 2 – Table 16.3-2)

Average Planar Exposure [GWD/ST]	MAPLHGR Limit [KW/ft]
0.00	13.78
17.15	13.78
60.78	6.87
63.50	5.50

Table 3-3
MAPLHGR SLO Multiplier
All Fuel Types
(Reference 2 – Table 16.3-3)

Fuel Type	SLO Multiplier
GE14C	0.78
GNF2	0.78

Note that per TS LCO 3.4.1, Single Loop Operation in the MELLLA or MELLLA+ domains is prohibited.

The MAPLHGR multipliers, $MAPFAC_P$ and $MAPFAC_F$, are set to unity for all power and flow conditions per Reference 2 – Section 16.

4.0 MCPR Limits

The Operating Limit MCPRs listed in Table 4-1 cover all conditions listed in Section 8.0, Modes of Operation. Additional EOOS information can be found in Section 8.0. ARTS provides for power and flow dependent thermal limits adjustments, which allow for a more reliable administration of the MCPR thermal limit. Per TS 3.2.2, all MCPR's shall be verified in accordance with limits specified in this section. Control rod scram time verification is also required per TS 3.1.4, "Control Rod Scram Times".

The applicable MCPR thermal limit set shall be determined with Tau (τ), a measure of scram time performance throughout the cycle based on the cumulative plant scram time test results. The equations listed below are the generic equations for Boiling Water Reactors listed in Reference 8 - Item 2, "CRD Scram Insertion Time Conformance Procedure". Nine Mile Unit 2 specific coefficients are provided in Reference 17 – Section 5.0.

Tau (τ) is determined based on the cumulative plant scram time test results. τ_A is the control rod average scram insertion time limit to notch 39 per TS 3.1.4, "Control Rod Scram Times". This corresponds to the SCRAM Time Option A MCPR thermal limit set in Table 4-1. The SCRAM Time Option B MCPR thermal limit set takes credit for measured plant SCRAM speeds that are faster than the τ_A SCRAM insertion time limit. The lower Option B limits may be used provided that the actual plant average scram speed (τ_{AVE}) is faster or equal to the Option B SCRAM time speed limit (τ_B). This is determined by ensuring that $\tau \leq 0$. The calculation of Tau shall be performed in accordance with site procedures. Linear interpolation shall be used to calculate the OLMCPR value if Tau is between 0.0 (Tau Option B) and 1.0 (Tau Option A). The equations for Tau are defined as follows:

$$\tau = \frac{\tau_{ave} - \tau_B}{\tau_A - \tau_B}$$

Where: $\tau_A = 0.866$ seconds (Reference 1, Section 3.1.4)

$\tau_B = 0.556 + 1.65 \cdot \sqrt{\frac{N_1}{\sum_{i=1}^{n} N_i}} \cdot 0.0098$ seconds (Reference 17, Section 5.0)

$\tau_{ave} = \frac{\sum_{i=1}^{n} N_i \tau_i}{\sum_{i=1}^{n} N_i}$ seconds

n is the number of surveillance tests performed in the cycle; N_i is the number of active control rods measured in surveillance test i; N_1 is the total number of active rods measured; τ_i is the average scram time to notch 39 for rods in surveillance test i; 0.556 is the mean distribution for average scram insertion time to position 39 drop-out; 0.0098 is the standard deviation of the distribution for average scram insertion time to position 39 drop-out at NMP2 (Reference 8 – Item 2, Reference 17 – Section 5.0).

Table 4-1
Operating Limit Minimum Critical Power Ratio (OLMCPR)
All Fuel Types
(Reference 2 – Section 11)

EOOS Combination	SCRAM Time Option	Cycle Exposure	
		<EOR-2404 MWD/ST	≥EOR-2404 MWD/ST
BASE	A	1.68	1.68
	B	1.48	1.48
BASE SLO	A	1.71	1.71
	B	1.51	1.51
TBVOOS	A	1.73	1.73
	B	1.50	1.50
TBVOOS SLO	A	1.76	1.76
	B	1.53	1.53
RPTOOS	A	1.78	1.78
	B	1.55	1.57
RPTOOS SLO	A	1.81	1.81
	B	1.58	1.60
PROOS	A	1.73	1.75
	B	1.55	1.57

Table 4-2
Power Dependent MCPR Limit Adjustments and Multipliers ($MCPR_P$)
All Fuel Types
(Reference 2 – Appendix D, Reference 16 – Section 7, Reference 17 – Section 4)

EOOS Combination	Core Flow [% of rated]	Core Thermal Power [% of rated]							
		0	23	<26	≥26	55	60	85	100
		Operating Limit MCPR			Operating Limit MCPR Multiplier (K_P)				
BASE	>75				1.218	1.180	1.150	1.056	1.000
	≤75	2.65	2.65	2.57					
BASE SLO	>75				1.218	1.180	1.150	1.056	1.000
	≤75	2.68	2.68	2.60					
TBVOOS	>75				1.218	1.180	1.150	1.056	1.000
	≤75	3.51	3.51	3.22					
TBVOOS SLO	>75				1.218	1.180	1.150	1.056	1.000
	≤75	3.54	3.54	3.25					
RPTOOS	>75				1.190	1.167	1.150	1.068	1.000
	≤75	2.65	2.65	2.57					
RPTOOS SLO	>75				1.190	1.167	1.150	1.068	1.000
	≤75	2.68	2.68	2.60					
PROOS	>75				1.190	1.167	1.158	1.056	1.000
	≤75	2.65	2.65	2.57					

ARTS power dependent thermal limits have been confirmed for operation with Equipment In-Service, Turbine Bypass Valves Out-Of-Service (TBVOOS), Recirculation Pump Trip Out-Of-Service (RPTOOS) and Pressure Regulator Out-Of-Service (PROOS).

Table 4-3
Flow Dependent MCPR Limits ($MCPR_F$) for DLO
All Fuel Types
(Reference 2 – Appendix D, Reference 16 – Table 7-20, Reference 17 – Table 4-17)

Flow [% rated]	$MCPR_F$ Limit
0.0	2.01
30.0	1.78
94.2	1.29
112.0	1.29

Table 4-4
Flow Dependent MCPR Limits ($MCPR_F$) for SLO
All Fuel Types
(Reference 2 – Appendix D, Reference 16 – Table 7-20, Reference 17 – Table 4-17)

Flow [% rated]	$MCPR_F$ Limit
0.0	2.04
30.0	1.81
94.2	1.32
112.0	1.32

5.0 LHGR Limits

The LHGR limit is the product of the exposure dependent LHGR limit and the minimum of the $LHGRFAC_P$ or the $LHGRFAC_F$.

The off-rated limits assumed in the ECCS-LOCA analyses are confirmed to be consistent with the cycle-specific off-rated LHGR multipliers calculated for MELLLA+ operation. The off-rated LHGR multipliers provide adequate protection for MELLLA+ operation (Reference 2).

Table 5-1
LHGR Limits for UO_2 Fuel
(Reference 5, Reference 6, Reference 13)

Fuel Type	LHGR Limit [KW/ft]
GE14C	See Reference 6 – Table D-2
GNF2	See Reference 13 – Table B-1

Table 5-2
LHGR Limits for Gadolinia Rods
(Reference 5, Reference 6, Reference 13)

Fuel Type	LHGR Limit [KW/ft]
GE14C	See Reference 6 – Table D-4
GNF2	See Reference 13 – Table B-2

Table 5-3*
Power Dependent LHGR Multiplier $LHGRFAC_P$
All Fuels Types
(Reference 2 – Appendix D, Reference 16 – Section 7, Reference 17 – Section 4)

EOOS Combination	Core Flow [% of rated]	Core Thermal Power [% of rated]							
		0	23	<26	≥26	55	60	85	100
BASE	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.495	0.495	0.502					
BASE SLO	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.495	0.495	0.502					
TBVOOS	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.475	0.475	0.502					
TBVOOS SLO	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.475	0.475	0.502					
RPTOOS	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.495	0.495	0.502					
RPTOOS SLO	>75				0.613	0.720	0.791	0.922	1.000
	≤75	0.495	0.495	0.502					
PROOS	>75				0.613	0.720	0.740	0.831	1.000
	≤75	0.495	0.495	0.502					

** BASE limits were used if EOOS limits are less limiting than BASE case.*

Table 5-4
Flow Dependent LHGR Multiplier $LHGRFAC_F$
All Fuel Types and Modes of Operation
(Reference 2 – Appendix D, Reference 16 – Section 7, Reference 17 – Section 4)

EOOS Condition	Core Flow [% of rated]				
	0	30	52.7	85	112
	$LHGRFAC_F$ Multiplier				
DLO	0.420	0.625		1.000	1.000
SLO	0.420	0.625	0.780	0.780	0.780

6.0 Rod Block Monitor Setpoints

Per Technical Specifications 3.3.2.1, the RBM instrumentation channels will be operable with the allowable values set to the values shown in Table 6-1. The values given in Table 6-1 are unfiltered; these unfiltered values are applicable as the time filter constant is set to zero. (Reference 9 – Table 5B, Reference 4 – Attachment 1 Table 4-5). 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 Rod Withdraw Error.

Table 6-1
Rod Block Monitor Setpoints[1]
(Reference 2 – Section 10, Reference 7 – Section 5.1.3, Reference 10 – Section 3)

Power Level	Allowable Value	Nominal Trip Setpoint	Analytical Limit
LTSP	124.6%	124.2%	127.0%
ITSP	119.6%	119.2%	122.0%
HTSP	114.6%	114.2%	117.0%
INOP	N/A	N/A	N/A

The ARTS RWE analysis validated the MCPR values in Table 6-2 below for use in Cycle 16. The RWE MCPR values have been analyzed at discrete setpoint values and unblocked (continuous withdraw) conditions. The most limiting RBM OLMCPR of 1.45 is less limiting than the minimum cycle-specific OLMCPR.

Table 6-2
ARTS RWE Validated MCPR Values
(Reference 2 – Section 10)

Power Level [% Rated]	MCPR
<90%	≥1.70
≥90%	≥1.40

[1] Values given are unfiltered; for filtered values see Reference 10.

7.0 Turbine Bypass Valve Parameters

Per Technical Specification LCO 3.7.5, whenever the reactor power is at or above 23% RTP the main turbine bypass system shall be operable or the plant must operate with the TBVOOS penalties. The definition of operable is given in Table 7-1 below.

Table 7-1
Turbine Bypass Valve Response Time
(Reference 11 – Section 1.6)

Event	Response Time [sec]
Maximum delay time before start of bypass valve opening following initial turbine inlet valve movement	0.15
Maximum time after initial turbine inlet valve movement for bypass valve position to reach 80% of full flow (includes the above delay time)	0.30

8.0 Modes of Operation

Table 8-1
Modes of Operation
(Reference 2, Reference 12 – Table 15.0-6, Reference 16)

Options[2]	Allowed Operating Region
BASE	Yes
BASE SLO	Yes
TBVOOS	Yes
TBVOOS SLO	Yes
RPTOOS	Yes
RPTOOS SLO	Yes
PROOS	Yes
MSIVOOS	Yes
MSIVOOS SLO	Yes

The ADSOOS and SRVOOS conditions are included in the BASE analysis and are therefore the same as the BASE OLMCPRs. There are no thermal limit penalties for combining any operating condition with the ADSOOS and/or the SRVOOS conditions.

For Automatic Depressurization System (ADS) valves out of service, all conditions support only one ADSOOS (Reference 16 – Section 7.2.1, Reference 1 – Section 3.5.1).

For Safety Relief Valves (SRV) Out of Service, all conditions support up to 2 SRVOOS (Reference 16 – Section 7.2.1).

[2] The EOOS Options listed apply to both Option A and Option B

For Main Steam Isolation Valve (MSIV) Out of Service, only one MSIV may be inoperable and reactor power must be maintained ≤ 75% rated power (Reference 16 – Section 7.2.1). There are no thermal limit penalties associated with MSIV out of service. Analogous to the ADSOOS and SRVOOS conditions, the MSIVOOS condition can be treated as the BASE case in the thermal limit tables.

SLO is restricted by two parameters, namely recirculation flow and rod line. The maximum allowable SLO recirculation drive flow is 41,800 GPM due to recirculation piping vibration limitations and the maximum SLO rod line is 89% (ELLLA boundary). Where these two parameters intersect on the Power Flow Maps restricts SLO maximum power. The SLO rod line restriction is also governed by Tech Spec 3.4.1 LCO (Reference 1). Operation in SLO is restricted to the ELLLA region; this region and applicable restrictions are described in the SLO Loop Power Flow Maps (References 14 and 15).

Operation with RPTOOS was justified for Nine Mile Point Unit 2 (Reference 16 –Section 7.2.1).

There is no formally analyzed option for FWHOOS, however per Reference 7 – Section 1.2.4 there is a 20°F decrease from the rated temperature within analyzed conditions.

9.0 Stability Protection

The OPRM Amplitude Discriminator Setpoint (S_{AD}) is 1.10 (Reference 2 - Section 15.2). Results have been validated with feedwater temperature ≥ 420.5°F in accordance with Reference 7. Per TS 5.6.5.a.4, the BSP regions and values are as shown below in Tables 9-1 and 9-2. A graphical representation of these values can be found in Appendix A (Reference 2).

Table 9-1
BSP Endpoints for Normal Feedwater Temperature[3]
(Reference 2 – Table 15-2)

Endpoint	Power [% of rated]	Flow [% of rated]	Definition
A1	69.1	43.6	Scram Region Boundary, HFCL
B1	39.7	29.5	Scram Region Boundary, NCL
A2	64.5	50.0	Controlled Entry Region Boundary, HFCL
B2	27.5	28.9	Controlled Entry Region Boundary, NCL
A3	96.0	79.7	BSP Boundary Intercept with MELLLA+ Boundary
B3	72.3	55.0	BSP Boundary Intercept with MELLLA+ Boundary

[3] Bounding for both DLO and SLO

Table 9-2
Automatic BSP Setpoints[4]
(Reference 2 – Table 15-3)

Parameter	Symbol	Value
Slope of Automatic BSP APRM flow-biased trip linear segment	m_{TRIP}	1.26
Automatic BSP APRM flow-biased trip setpoint power intercept. Constant Power Line for Trip from zero Drive Flow to Flow Breakpoint value.	$P_{BSP-TRIP}$	39.7% RTP
Automatic BSP APRM flow-biased trip setpoint drive flow intercept. Constant Flow Line for Trip.	$W_{BSP-TRIP}$	36.9% RDF
Flow Breakpoint value	$W_{BSP-BREAK}$	16.4% RDF

10.0 Power Flow Operating Map

See Appendix B for a Power Flow Map (Reference 7).

11.0 Methodology

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the Nuclear Regulatory Commission, particularly those described in the following documents:

1. "General Electric Standard Application for Reactor Fuel (GESTAR II)", NEDE-24011-P-A-21, May 2015
2. "General Electric Standard Application for Reactor Fuel (GESTAR II) (Supplement for United States)", NEDE-24011-P-A-21-US, May 2015

[4] Applicable to both DLO and SLO.

12.0 References

1. "Nine Mile Point Nuclear Station Unit 2 Renewed Facility Operating License", Docket No. 50-410, Renewed License No. NPF-69, Exelon Document.
2. "Supplemental Reload Licensing Report for Nine Mile Point Unit 2 Reload 15 Cycle 16 Extended Power Uprate (EPU)/Maximum Extended Load Line Limit Analysis Plus (MELLLA+)", December 2017, Global Nuclear Fuel Document No. 001N4653, Revision 2.
3. [REMOVED]
4. "Nine Mile Point Nuclear Station Unit 2 ARTS/MELLLA, Task T0900: Transient Analysis", GE Energy Document No. GE-NE-0000-0055-2373-R0, Revision 0, February 2007.
5. "Fuel Bundle Information Report for Nine Mile Point Unit 2 Reload 15 Cycle 16 Extended Power Uprate (EPU)/Maximum Extended Load Line Limit Analysis Plus (MELLLA+)", GNF Document No. 001N4654, Revision 0, February 2016.
6. "GE14 Compliance with Amendment 22 of NEDE-24011-P-A (GESTAR II), NEDC-32868P, Revision 5, May 2013," GNF Document No. MFN 13-028, May 24, 2013.
7. "Safety Analysis Report for Nine Mile Point Unit 2 Maximum Extended Load Line Limit Analysis Plus", GEH Document No. NEDC-33576P Revision 0, October 2013.
8. "Qualification of the One-Dimensional Core Transient Model for Boiling Water Reactors," NEDO-24154 and NEDE-24154P, Volumes I, II, and III, October 1978.
9. "Revise 22A2843AM", Engineering Change Notice for NSSS161405000 "Design Spec Data Sheet, Neutron Monitoring System", Exelon Document Number 007242, Rev. 1, April 1st, 2008.
10. "Instrumentation Limits Calculation Constellation Generation Group Nine Mile Point Nuclear Station Unit 2 Rod Block Monitor (NUMAC ARTS-MELLLA)" GEH Document No. 0000-0053-1006 NMP2 A-M-T506-RBM-Calc-2006, Revision 1, March 2008.
11. "Final resolved OPL-3 parameters for NMP2 C16", Exelon ENSAF ID Number ES1500019 Revision 0, June 23rd, 2015.
12. "Nine Mile Point Nuclear Station Unit 2 Updated Safety Analysis Report", U.S. Nuclear Regulatory Commission Docket 50-410 License NPF-69, Revision 22, October 2016, Exelon Document.
13. "GNF2 Advantage Generic Compliance with NEDE-24011-P-A (GESTAR II)", NEDC-33270P, Revision 5, May 2013, GNF Document No. MFN 13-029, May 24, 2013
14. "Power Flow Operating Map 1 Recirc Loop in Operation (OPRM System Operable)", Nine Mile Point Drawing No. EM-950B-001, Revision 18.00, September 9th, 2015, Exelon Document.

15. "Power Flow Operating Map 1 Recirc Loop in Operation (OPRM System Inoperable)", Nine Mile Point Drawing No. EM-950B-002, Revision 00.00, September 9th, 2015, Exelon Document.
16. "GNF2 Fuel Design Cycle-Independent Analyses for Exelon Nine Mile Point Nuclear Station Unit 2", GEH Document No. 003N2003 Revision 1, February 2016.
17. "Nine Mile Point Unit 2 Option B' Scram Speed Implementation", GEH Document No. 004N0521-R0, September 2017.

Appendix A

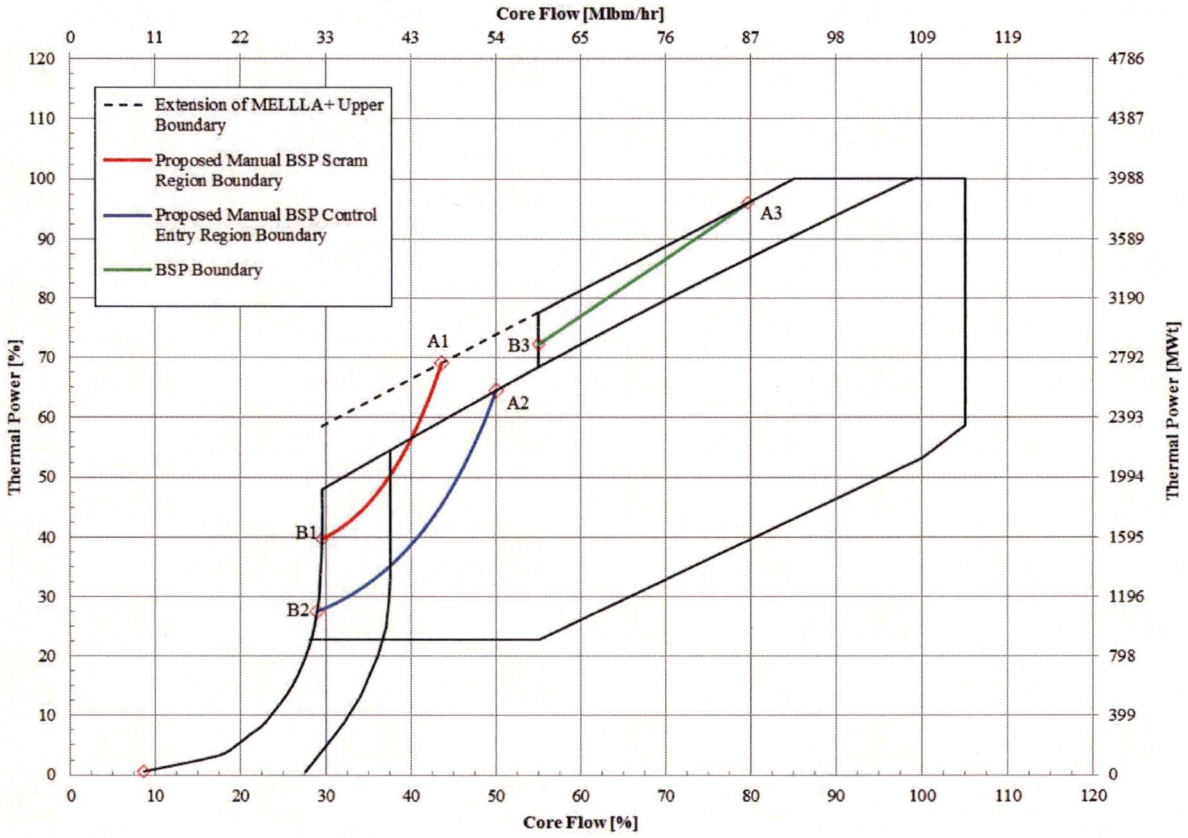

Figure 19 Manual BSP Regions and BSP Boundary for Normal Feedwater Temperature Operation

Appendix B

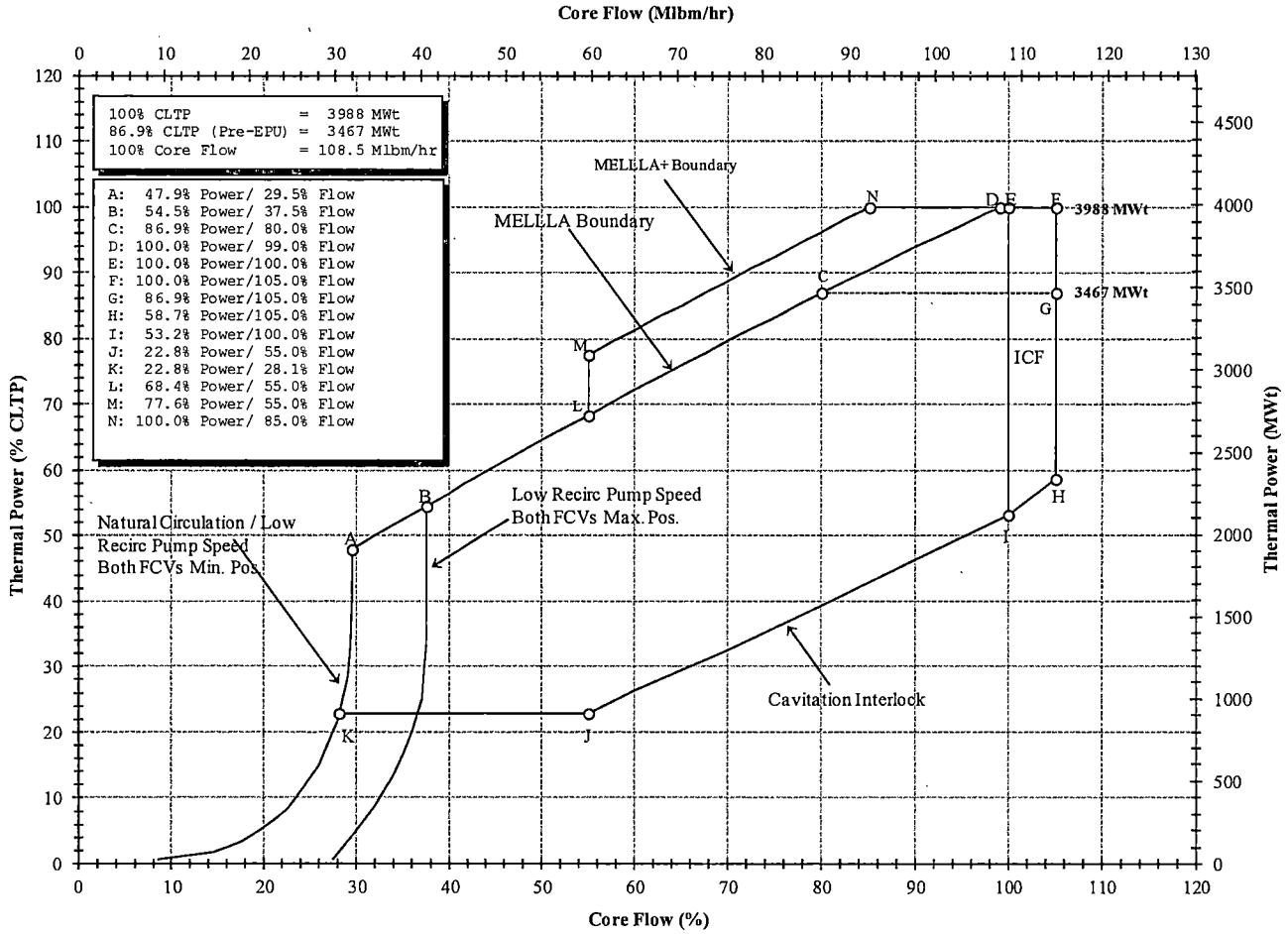

Figure 1-1 Power/Flow Operating Map for MELLLA+ in Dual Loop Operation

Note: Operation in the MELLLA+ and MELLLA regions is not analyzed for single loop operation. Refer to Section 8.0 Modes of Operation, Tech Spec 3.4.1 (Reference 1), and Reference 14 and 15 (SLO Power-to-Flow Map) for Single Loop Operation restrictions.