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NMP1L 1959

U. S. Nuclear Regulatory Commission
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SUBJECT: Nine Mile Point Unit 1
Docket No. 50-220
License No. DPR-63

Cycle 17 Core Operating Limits Report, Revision 0

Gentlemen:

Attached is a copy of the Cycle 17 Core Operating Limits Report (COLR), Revision 0, for Nine Mile Point Unit 1 (NMP1). This report is being submitted pursuant to NMP1 Technical Specification 6.6.5.d.

Very truly yours,

William C. Holston
Manager Engineering Services

WCH/RF/sac
Attachment

cc: Mr. S. J. Collins, NRC Regional Administrator, Region I
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A001

NINE MILE POINT UNIT 1

CORE OPERATING LIMITS REPORT

Document No.: COLR1-17

Revision 0

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This Controlled Document provides cycle specific core operating limits for use in conjunction with the Nine Mile Point Unit 1 Technical Specifications. Document pages may only be changed through a reissue of the entire document.

CORE OPERATING LIMITS REPORT

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CORE OPERATING LIMITS REPORT

1.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

1.1 Limits for Technical Specification 3.1.7.a

During power operation, the APLHGR for each type of fuel as function of average planar exposure shall not exceed the limiting values shown in Table 1.

1.2 Limits for Technical Specification 3.1.7.e

During partial loop operation with four recirculation loops in operation, the APLHGR as a function of average planar exposure shall not exceed 98 percent of the limiting values shown in Table 1.

During partial loop operation with three recirculation loops in operation, the APLHGR as a function of average planar exposure shall not exceed 98 percent of the limiting values shown in Table 1.

2.0 MINIMUM CRITICAL POWER RATIO (MCPR)

2.1 Limits for Technical Specification 3.1.7.c

During power operation, the operating MCPR at rated power and flow shall be greater than or equal to the Operating Limit MCPR of:
1.48[1] for cycle exposures[2] from BOC19 to EOR19-2417 MWd/ST, and
1.53[1] for cycle exposures[2] from EOR19-2417 MWd/ST to EOC19.

If the feedwater pump configuration, as defined by Nuclear Engineering Report No. NER-1M-022, is such that a feedwater controller failure could result in maximum feedwater flow greater than that for two feedwater pumps (i.e., the shaft-driven pump plus one motor-driven pump), then the Operating Limit MCPR shall be 1.59.

For core flows other than rated, the MCPR limit shall be the Operating Limit MCPR identified above times K_f where K_f is as shown in Figure 2a.

Additional limits for operation between 45% and 90% Rated Thermal Power (RTP)[3][4] are required for operations without a backup pressure regulator. These limits are shown in Figure 2b.

2.2 Limits for Technical Specification 3.1.7.e

During 3 loop operation, the Operating Limit MCPR shall be increased by 0.02. No adjustment is needed during 4 loop operation.

NOTES:
(1) Based on a 1.07 MCPR Safety Limit (SLCPR).
(2) These cycle exposures are defined in the Cycle Management Report.
(3) Below 45% and above 90% RTP no additional limits are required for operation without a backup pressure regulator.
(4) These limits are valid for 3, 4, and 5 loop operation. (Note that for the MCPR Limit for 70% ≤ 90%, i.e. MCPR Limit = (Rated OLMCPR) / FRTP, the Rated OLMCPR is as determined by 2.1 and 2.2 above.)

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 Limits for Technical Specification 3.1.7.b

During power operation, the Linear Heat Generation Rate (LHGR) of any rod in any fuel assembly at any axial location shall not exceed the limiting values shown in RSLD-18, Revision 0, "Nine Mile Point Unit 1 Reload 18, Reload Specific Lattice Data". This document contains the LHGR limits for both UO2 rods (which contain no gadolinium) and the most limiting gadolinium-bearing rods. Other gadolinium-bearing rods have LHGR limits which lie between these two curves. Compliance with these limits will be monitored by the plant's process computer.

Additional limits for operation between 45% and 90% RTP[(1)] are required for operations without a backup pressure regulator. These limits are shown in Figure 3.

NOTE: (1) Below 45% and above 90% RTP no additional limits are required for operation without a backup pressure regulator.

4.0 POWER/FLOW RELATIONSHIP DURING OPERATION

4.1 Limits for Technical Specification 3.1.7.d and e

The power/flow relationship shall not exceed the limiting values shown in Figure 4.

5.0 REFERENCES FOR TECHNICAL SPECIFICATIONS

Technical Specification 6.6.5.b:
NEDE 24011-P-A, "General Electric Standard Application for Reactor Fuel," U.S. Supplement, Revision 14, June 2000.

6.0 SOURCE DOCUMENTS

The Core Operating Limits contained in this report were obtained from the following documents:

CORE OPERATING LIMITS	REFERENCE
APLHGR Limits (Section 1.0) Table 1 and corresponding three and four loop multipliers	0000-0017-3629-SRLR, Revision 1, March 2005, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Power Station Unit 1, Reload 18 Cycle 17
MCPR Limits (Section 2)	0000-0017-3629-SRLR, Revision 1, March 2005, Supplemental Reload Licensing Report for Nine Mile Point Nuclear Power Station Unit 1, Reload 18 Cycle 17 0000–0017–3637–ER, Revision 0, March 2005, Engineering Report for Nine Mile Point Nuclear Power Station Unit 1,Reload 18 Cycle 17
Pressure Regulator Out-of-Service Restriction	GE-NE-J11-03433-16-01-R1, "Pressure Regulator Out of Service Calculations for Nine Mile Point Unit 1", January 2005
LHGR Limits (Section 3)	
Pressure Regulator Out-of-Service Restriction	GE-NE-J11-03433-16-01-R1, "Pressure Regulator Out of Service Calculations for Nine Mile Point Unit 1", January 2005 0000-0017-3629-FBIR, Revision 0, "Fuel Bundle Information Report for Nine Mile Point Nuclear Station Unit 1 Reload 18 Cycle 17," March, 2005.
Power/Flow Relationship (Section 4)	NMP1 Technical Specification Amendment 92, Figure 3.1.7.aa

Table 1

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Average Planar Exposure GWd/ST	MAPLHGR Limits (kw/ft)				
	Bundle GE11-C14	Bundle GE11-C15	Bundle GE11-C16A	Bundle GE11-C16B	Bundle GE11-C17
0.00	8.90	8.82	9.93	9.93	9.81
0.20	8.90	8.82	9.93	9.93	9.81
1.00	8.96	8.89	9.89	9.90	9.78
5.00	9.32	9.22	9.78	9.70	9.64
10.00	9.66	9.56	9.61	9.67	9.49
15.00	9.57	9.50	9.53	9.53	9.36
17.50	9.33	9.49	9.53	9.53	--
20.00	8.64	9.44	8.88	8.88	8.87
25.00	8.46	8.58	8.61	8.61	8.41
30.00	--	8.32	8.45	8.45	--
35.00	7.90	8.26	8.42	8.42	8.30
45.00	6.79	8.34	8.44	8.44	8.31
50.00	6.31	--	8.47	8.47	--
55.00	--	8.41	8.48	8.48	8.37
65.00	6.38	8.48	6.38	6.38	8.46

NOTE:
(1) A "--" indicates that there is no entry for this box and the limit can be determined by linearly interpolating between the previous and next point in each column. MAPLHGRs are interpolated between exposure points for which explicit values are given.
(2) These MAPLHGR are not lattice dependent. The values shown also correspond to the limiting value for the most limiting lattice for use when hand calculations are required.

Fuel Type	ID
GE11-P9DUB339-12GZ-100T-145-T6-2537	GE11-C14
GE11-P9DUB362-13GZ-100T-145-T6-3899	GE11-C15
GE11-P9DUB376-12GZ-100T-145-T6-2585	GE11-C16A
GE11-P9DUB376-12GZ-100T-145-T6-2586	GE11-C16B
GE11-P9DUB382-13GZ-100T-145-T6-2831	GE11-C17

Figure 2a NMP-1 K(f) Curve for MCPR

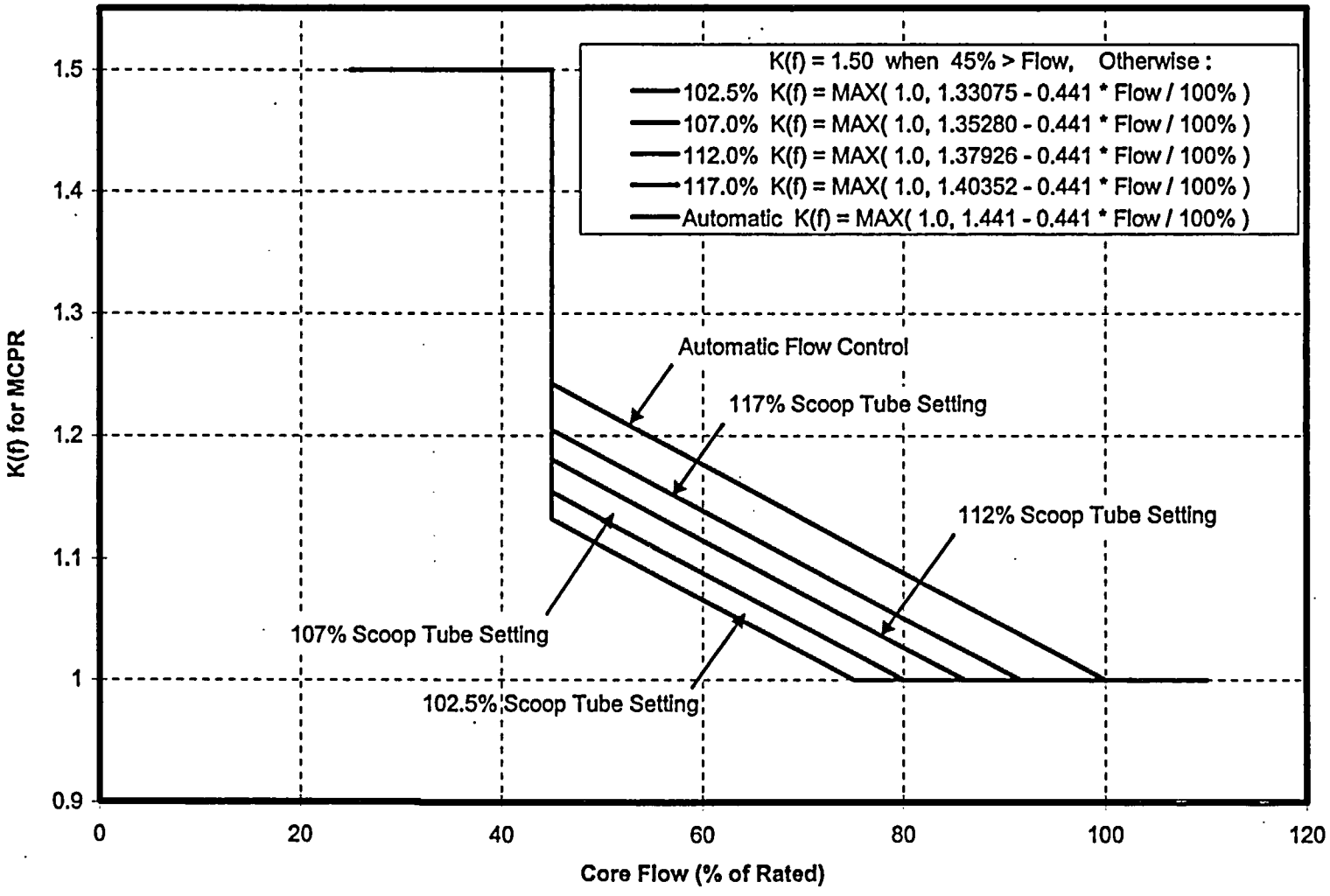

Figure 2b: MCPR Limits for Operation Between 45% and 90% RTP Without a Backup Pressure Regulator

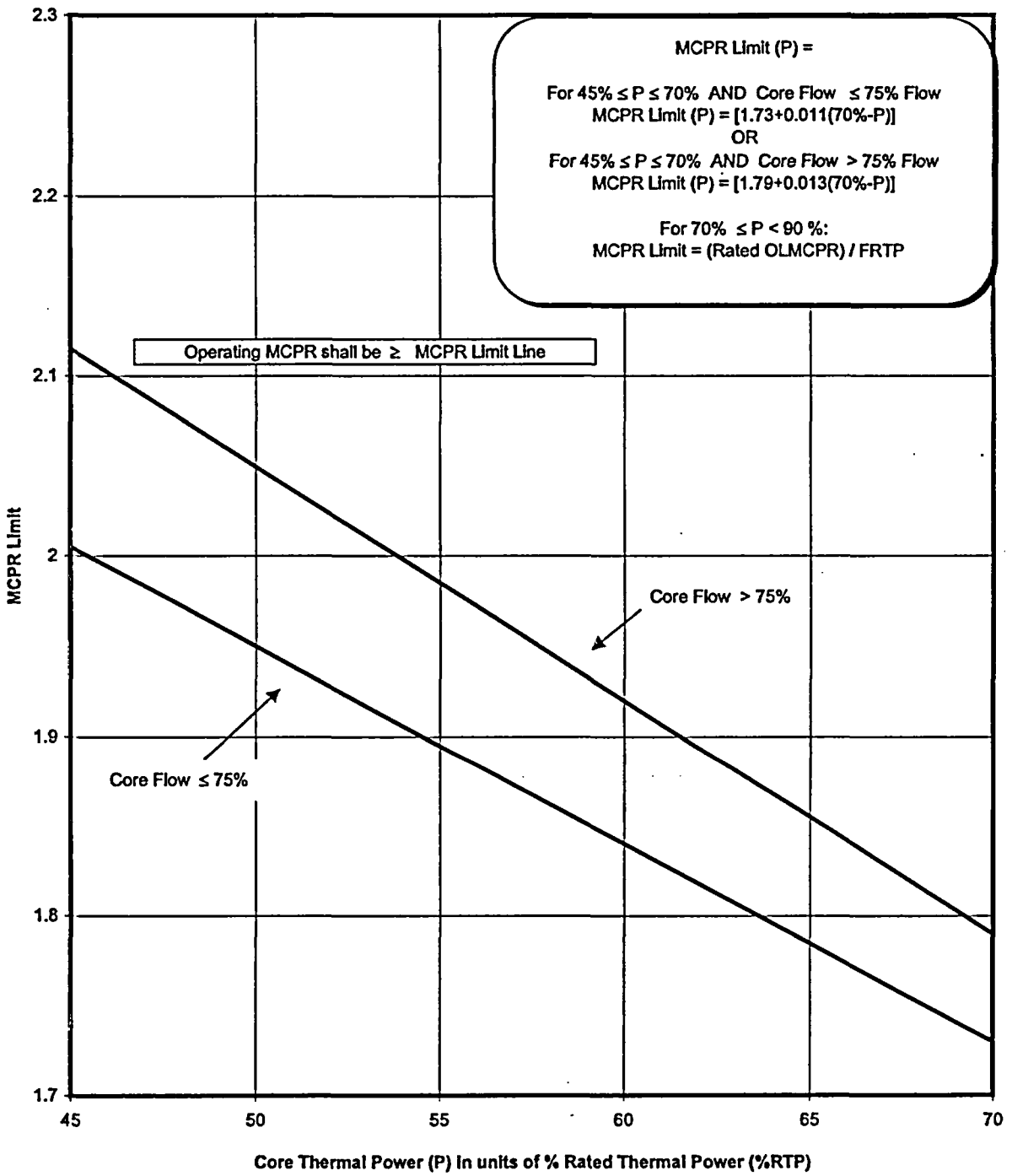

Figure 3: LHGR Limits for Operation Between 45% and 90% RTP Without a Backup Pressure Regulator

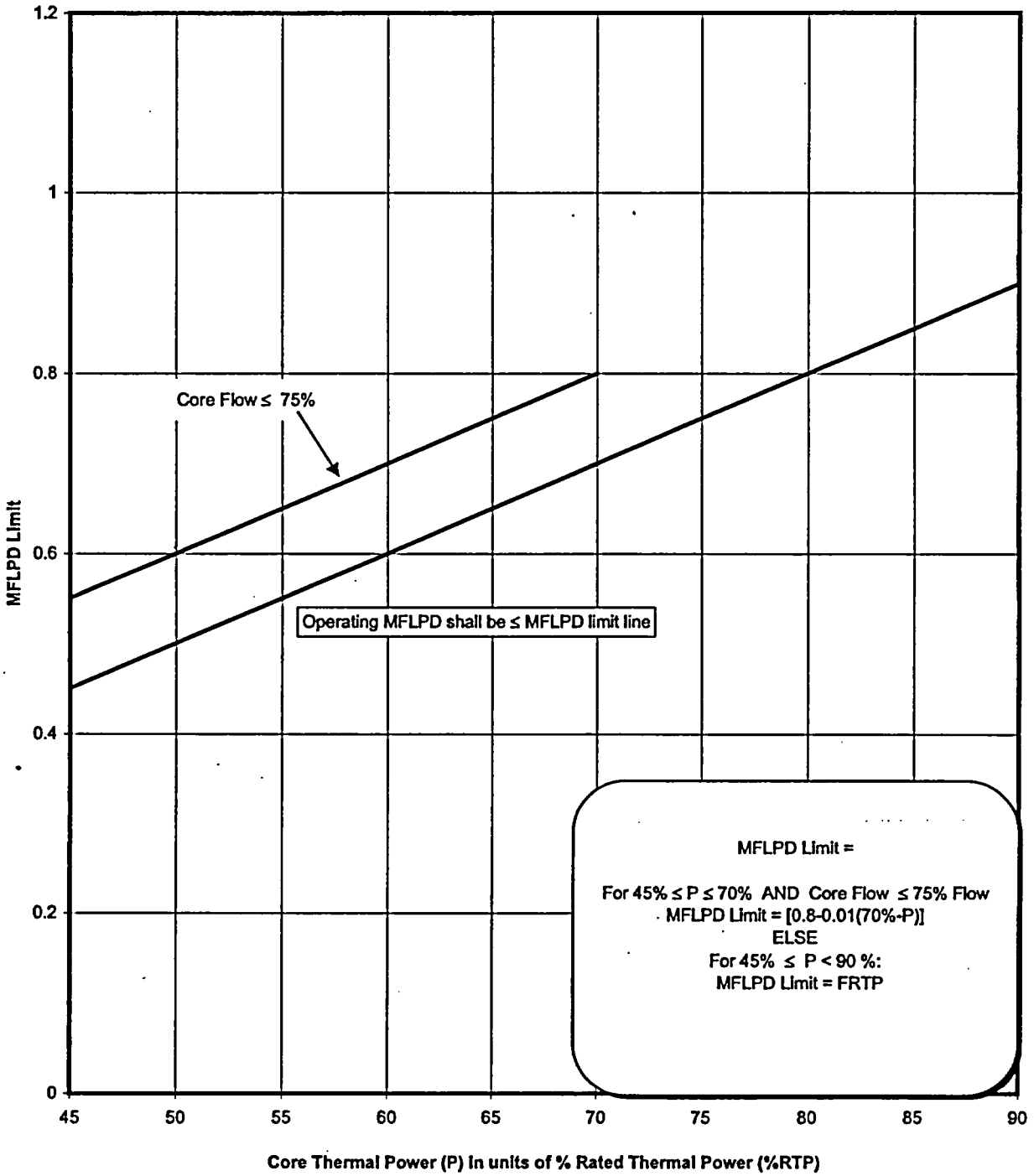

Figure 4 Limiting Power / Flow Line