

**Constellation Energy**

Nine Mile Point Nuclear Station

P.O. Box 63  
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May 1, 2006

U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**ATTENTION:** Document Control Desk

**SUBJECT:** Nine Mile Point Nuclear Station  
Unit No. 2; Docket No. 50-410

Cycle 11 Core Operating Limits Report, Revision 0

Attached is a copy of the Cycle 11 Core Operating Limits Report (COLR), Revision 0, for Nine Mile Point Unit 2 (NMP2). This report is being submitted pursuant to NMP2 Technical Specification 5.6.5.d.

Should you have questions regarding the information in this submittal, please contact M. H. Miller, Licensing Director, at (315) 349-1510.

Very truly yours,

Mark A. Schimmel  
Manager Engineering Services

MAS/RF/sac

Attachment: (1) Nine Mile Point Unit 2 Core Operating Limits Report

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A001

Document Control Desk

May 1, 2006

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NMP2L 2130

COMMITMENTS IDENTIFIED IN THIS CORRESPONDENCE:
<ul style="list-style-type: none"><li>NONE</li></ul> <p><b>Responsible Person/Organization:</b></p> <p><b>Due Date:</b></p> <p><b>SAR/TSB Revision Required? If yes,</b></p> <p><b>Type:</b></p> <p><b>Initiation Date:</b></p> <p><b>NCTS No.:</b></p>

Posting Requirements for Responses -- NOV/Order      No

**ATTACHMENT (1)**

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**Nine Mile Point Unit 2  
Core Operating Limits Report**

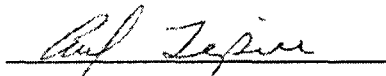





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NINE MILE POINT UNIT 2

CORE OPERATING LIMITS REPORT

Document No.: COLR2-11

Revision 0, Cycle 11

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This Controlled Document provides cycle specific core operating limits for use in conjunction with the Nine Mile Point Unit 2 Technical Specifications. Document pages may only be changed through a reissue of the entire document.

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

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**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

1.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

1.1 Limits for Technical Specification 3.2.1

The APLHGR(s) for each type of fuel as a function of AVERAGE PLANAR EXPOSURE shall not exceed the limits shown in Table 1.

The limits of Table 1 shall be reduced to a value of .78 times the two recirculation loop operation limit when in single recirculation loop operation.

Table 1

MAPLHGR VERSUS AVERAGE PLANAR EXPOSURE

Average Planar Exposure, GWd/ST	MAPLHGR Limits (kw/ft)									
	Bundle GE11-C6	Bundle GE11-C9A	Bundle GE11-C9B	Bundle GE11-C9C	Bundle GE14-C10A	Bundle GE14-C10B	Bundle GE14-C10C	Bundle GE14-C11A	Bundle GE14-C11B	Bundle GE14-C11C
0.00	13.42	13.42	13.42	13.42	12.82	12.82	12.82	12.82	12.82	12.82
14.51	---	---	---	---	12.82	12.82	12.82	12.82	12.82	12.82
19.13	---	---	---	---	12.82	12.82	12.82	12.82	12.82	12.82
19.72	13.42	13.42	13.42	13.42	---	---	---	---	---	---
27.22	12.29	12.29	12.29	12.29	---	---	---	---	---	---
57.61	---	---	---	---	8.00	8.00	8.00	8.00	8.00	8.00
63.50	8.90	8.90	8.90	8.90	5.00	5.00	5.00	5.00	5.00	5.00

Fuel Type	ID
GE11-P9CUB375-12GZ-120T-146-T6	GE11-C6
GE11-P9CUB404-12GZ-120T-146-T6-2504	GE11-C9A
GE11-P9CUB407-14GZ-120T-146-T6-2505	GE11-C9B
GE11-P9CUB407-14GZ-120T-146-T6-2506	GE11-C9C
GE14-P10CNAB406-15GZ-120T-150-T6-2687	GE14-C10A
GE14-P10CNAB404-15GZ-120T-150-T6-2688	GE14-C10B
GE14-P10CNAB403-17GZ-120T-150-T6-2689	GE14-C10C
GE14-P10CNAB415-17GZ-120T-150-T6-2874	GE14-C11A
GE14-P10CNAB414-16GZ-120T-150-T6-2873	GE14-C11B
GE14-P10CNAB417-15GZ-120T-150-T6-2872	GE14-C11C

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.

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

2.0 MINIMUM CRITICAL POWER RATIO (ODYN OPTION B)

2.1 Limits for Technical Specification 3.2.2

The Minimum Critical Power Ratio (MCPR) shall be equal to or greater than the appropriate MCPR limit from Figures 2a-14 and 2b-14 for GE14 and Figures 2a-11 and 2b-11 for GE11 times the K(f) shown in Figure 2c with tau (or "τ") defined as follows:

$$\tau = (\tau_{ave} - \tau_B) / (\tau_A - \tau_B)$$

where:

$\tau_A = 0.866$  seconds, control rod average scram insertion time limit to notch 39 per Specification 3.1.4.

$$\tau_B = .672 + 1.65 * [ N_1 / \sum_{i=1}^n N_i ]^{1/2} * .016$$

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

n = number of surveillance tests performed in cycle.

$N_i$  = number of active control rods measured in the  $i^{th}$  surveillance test

$\tau_i$  = average scram time to notch 39 of all rods measured in the  $i^{th}$  surveillance test

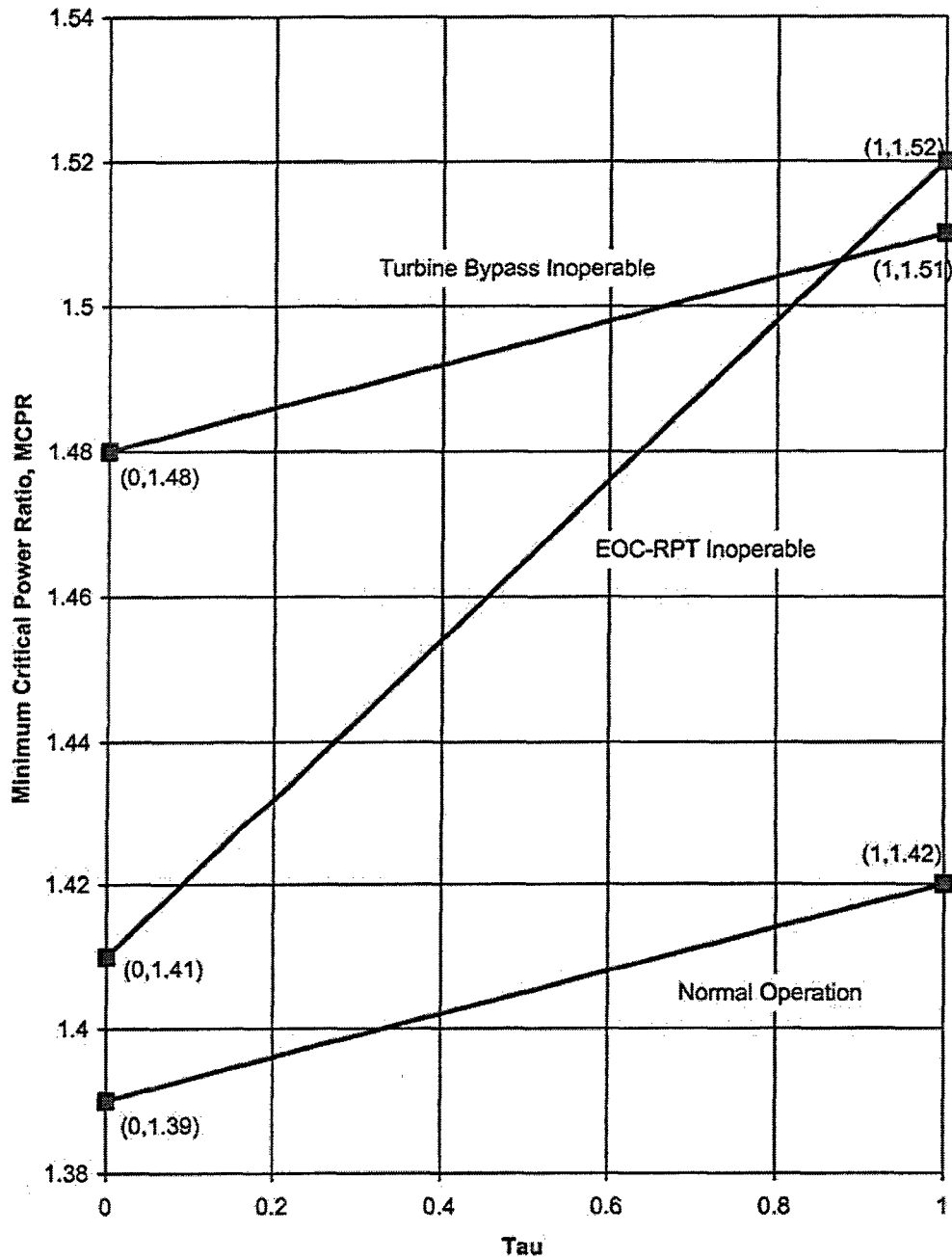
$N_1$  = total number of active rods measured in Specification 3.1.4.1.

**NOTES:**

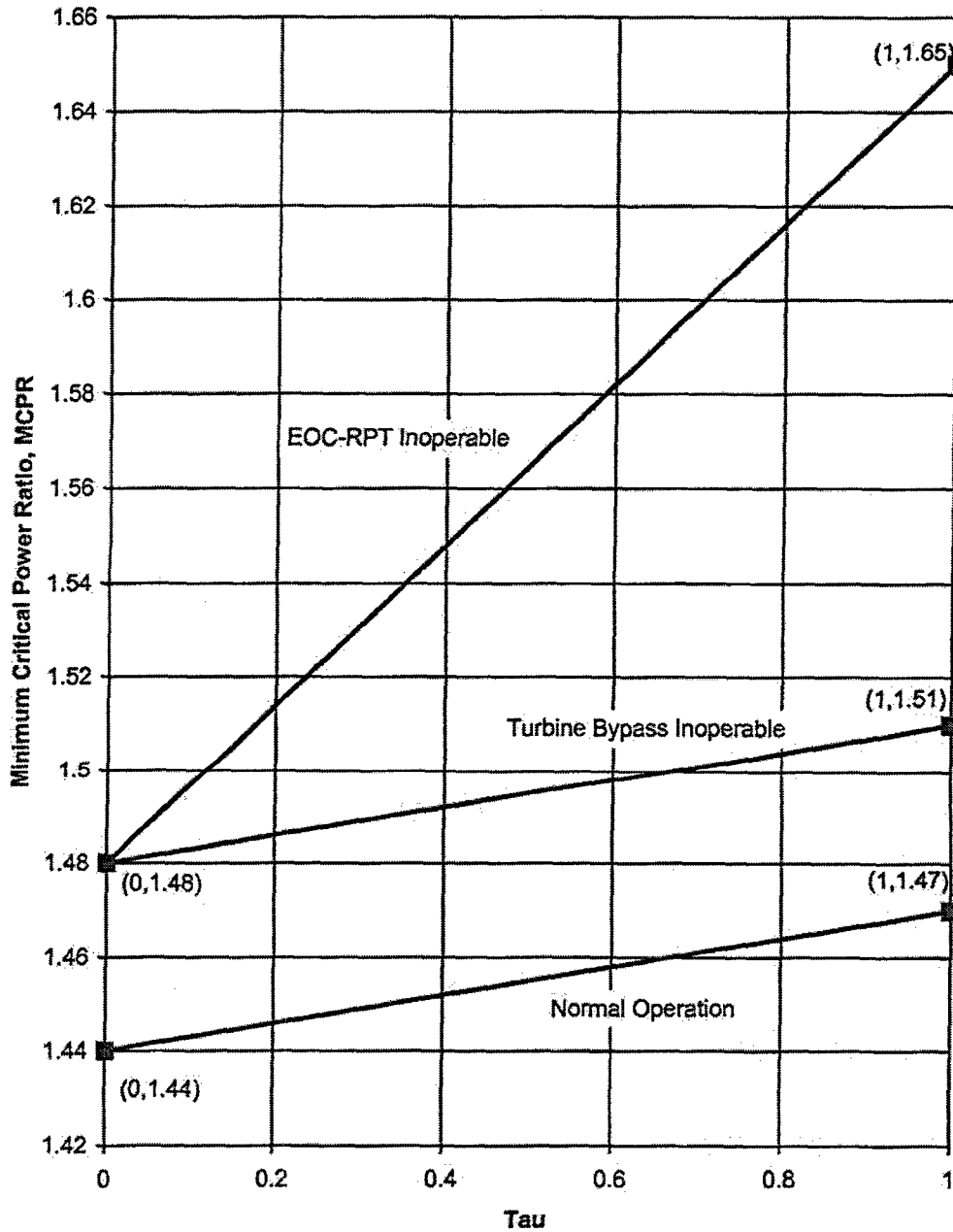
1. The MCPR Operating Limits in Figures 2a-11, 2a-14, 2b-11 and 2b-14 are based on a 1.07 Safety Limit MCPR (SLMCPR) for two recirculation loop operation and a 1.09 Safety Limit MCPR for single loop operation.
2.  $\tau = 1.0$  prior to performance of the initial scram time measurements for the cycle.
3. The Operating Limit MCPR values for Turbine Bypass Out of Service and EOC-RPT Out of Service are higher (more limiting) than for the standard normal operation case, and are therefore specifically identified in Figures 2a-14, 2b-14, 2a-11, and 2b-11. The OLMCPR values for all other analyzed EOOS transient events are bounded by the Normal Operation limits.
4. For operation between 30% and 90% RTP with a backup pressure regulator out of service, additional MCPR limit requirements have been established in Figures 2d and 2e.
5. EOR on Figures 2a-14, 2b-14, 2a-11, and 2b-11 is the End of Rated exposure as defined in the Cycle Management Report



Figure 2a-14  
 Nine Mile Point 2 Cycle 11  
 GE14 MCPR Operating Limits  
 (Beginning Of Cycle to EOR-1140 MWd/ST)



**Figure 2b-14**  
**Nine Mile Point 2 Cycle 11**  
**GE14 MCPR Operating Limits**  
**(EOR-1140 MWd/ST to End Of Cycle)**



**Figure 2a-11**  
**Nine Mile Point 2 Cycle 11**  
**GE11 MCPR Operating Limits**  
**(Beginning Of Cycle to EOR-1140 MWd/ST)**

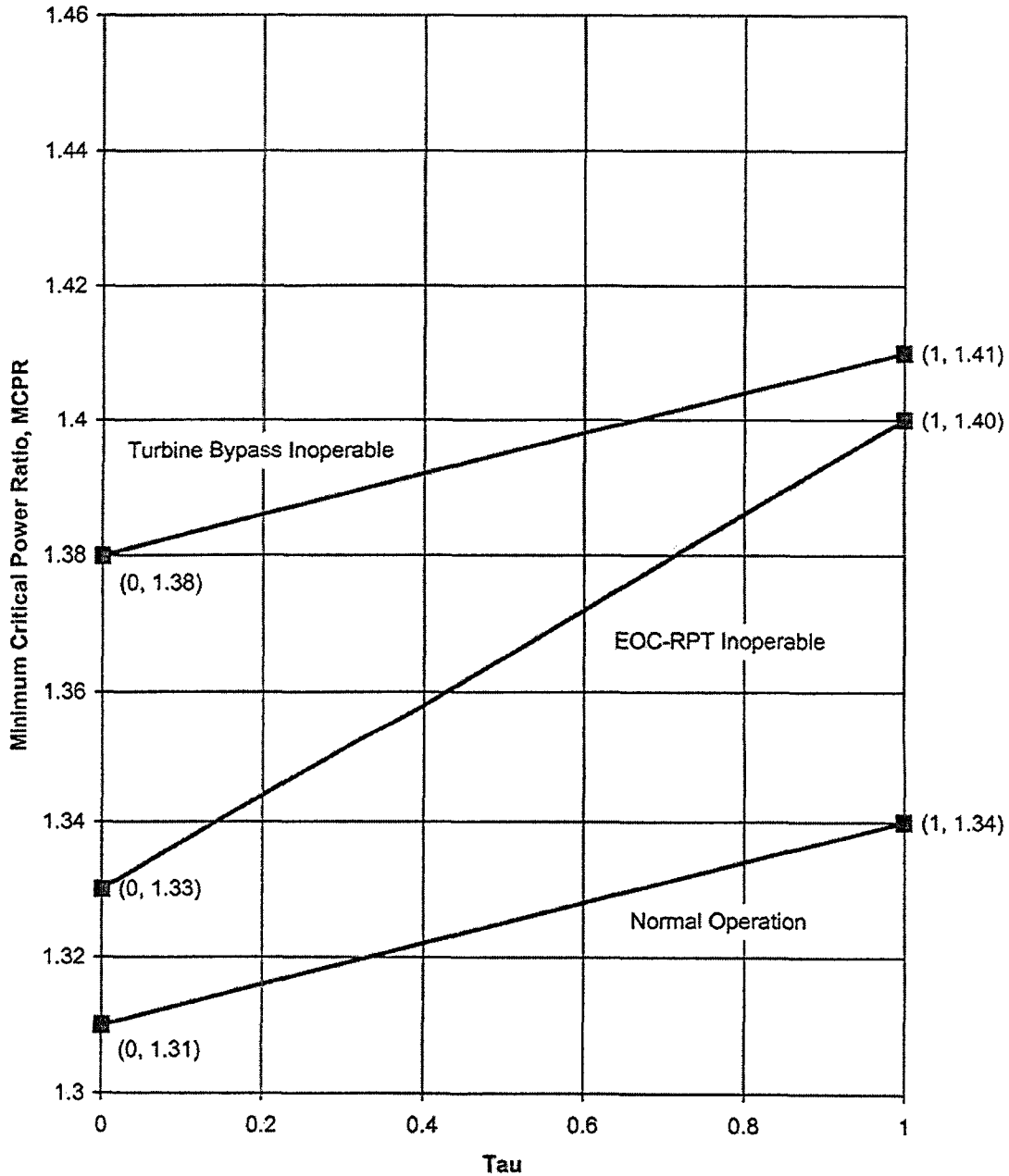
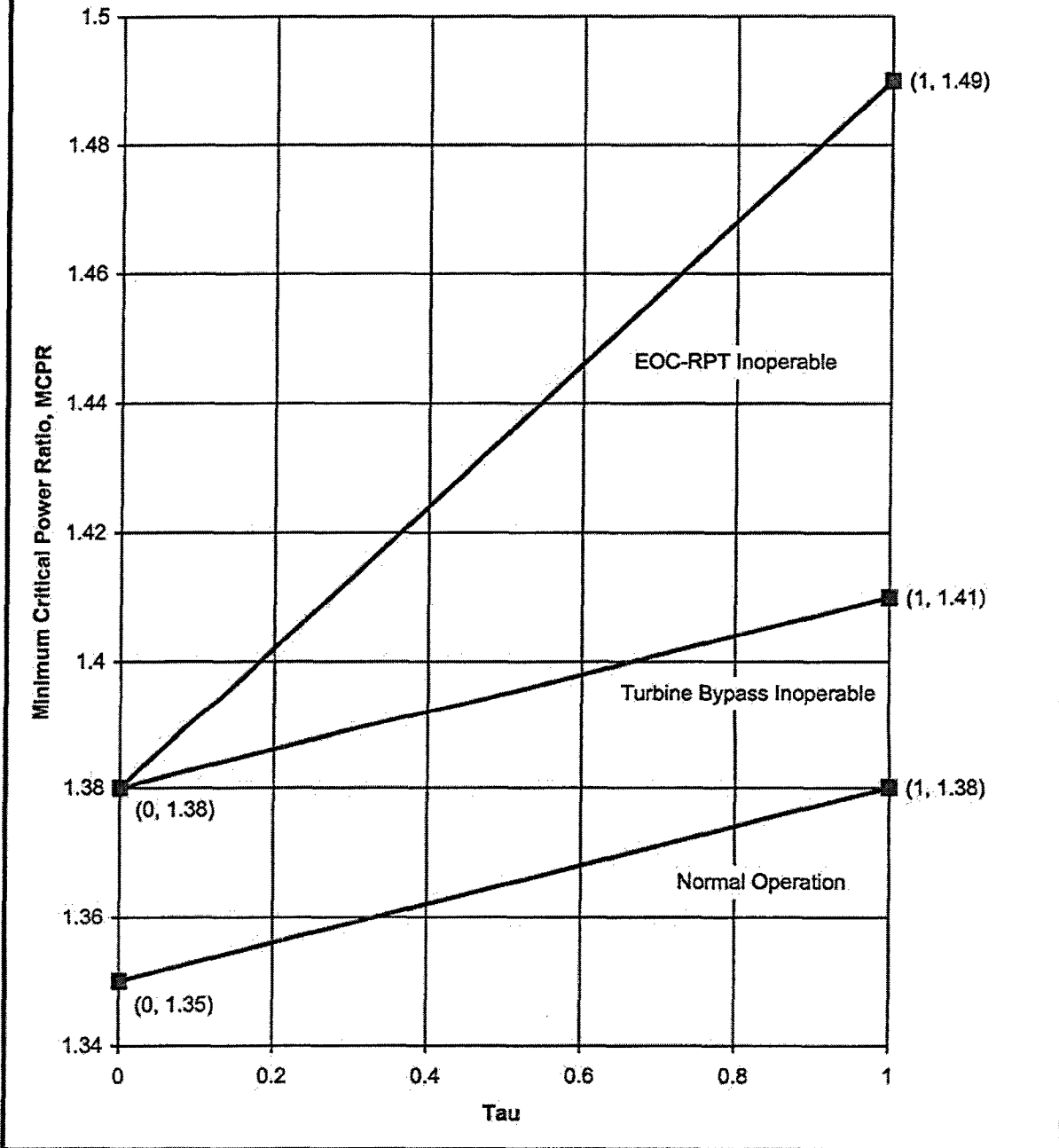


Figure 2b-11  
Nine Mile Point 2 Cycle 11  
GE11 MCPR Operating Limits  
(EOR-1140 MWd/ST to End Of Cycle)



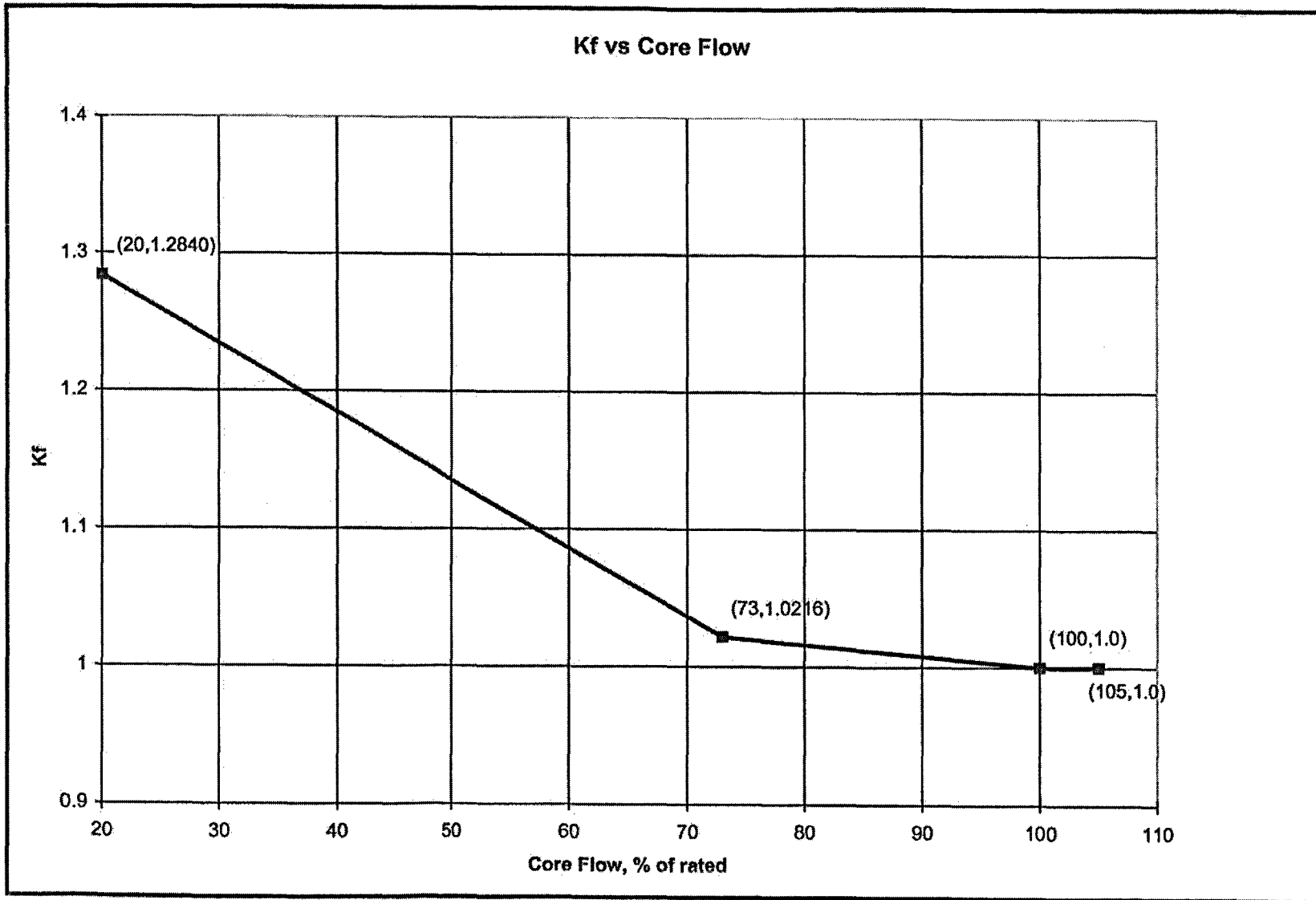


Figure 2d

GE11 MCPR Limits for Operation Without a Backup Pressure Regulator

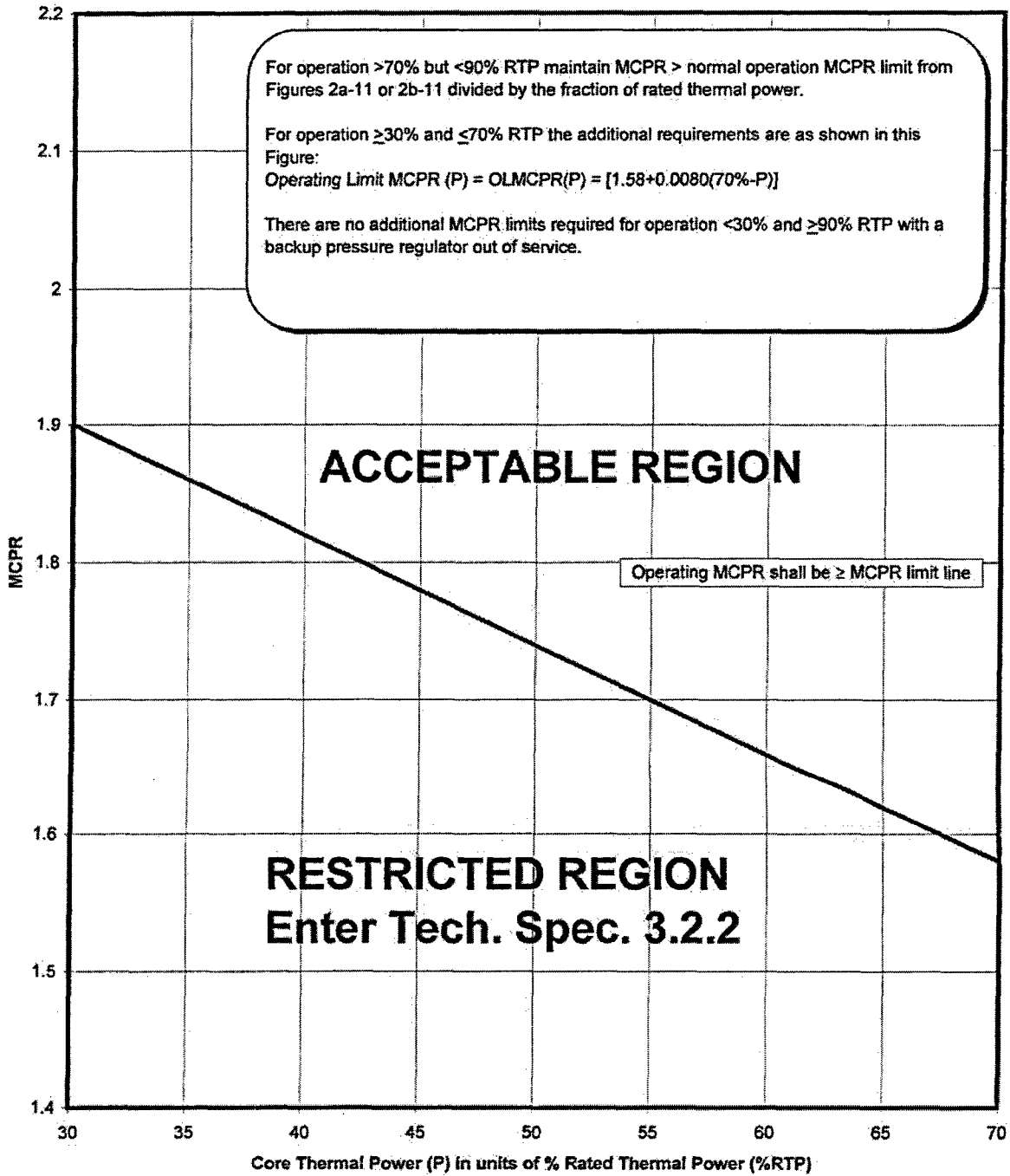
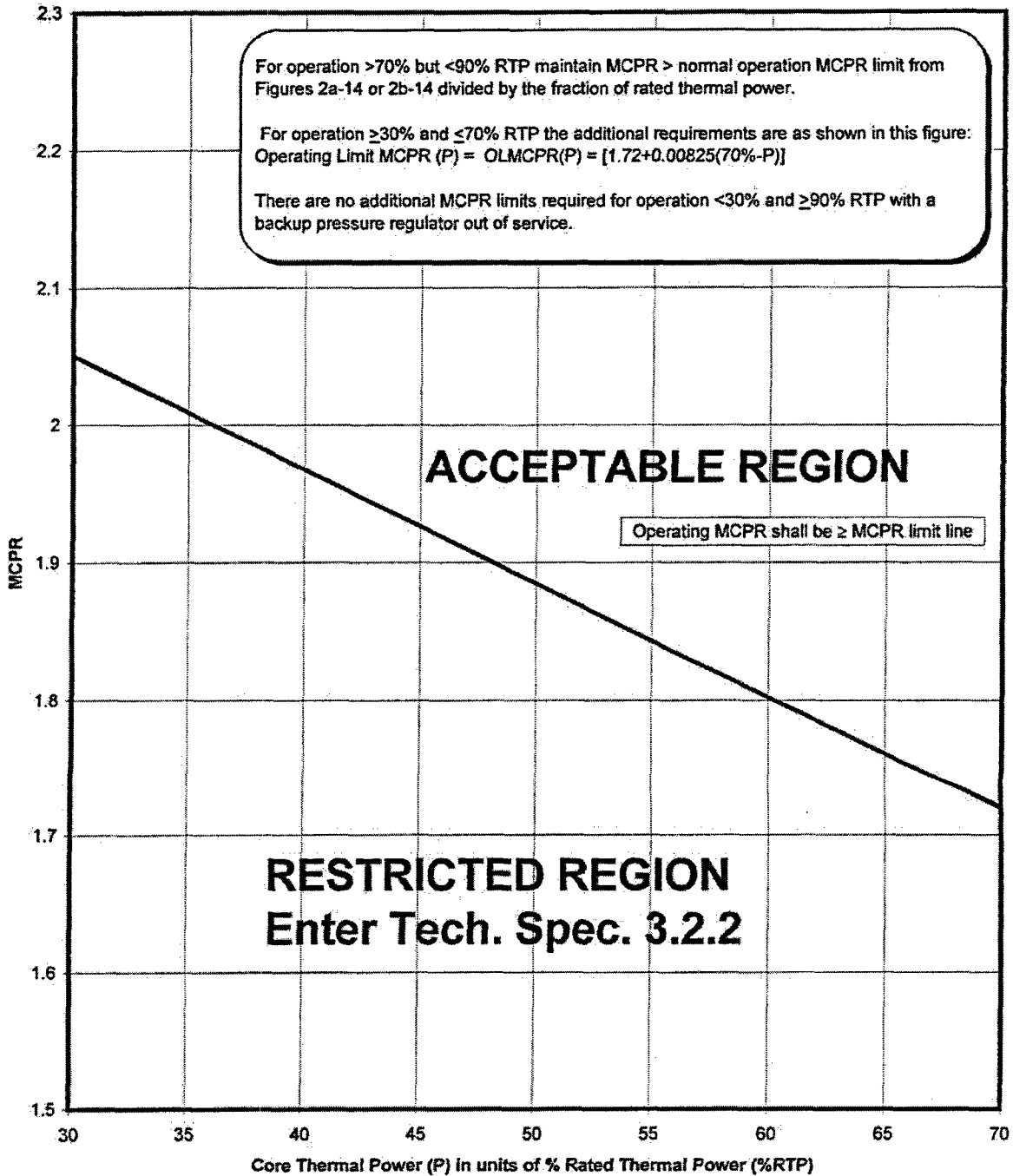


Figure 2e

GE14C MCPR Limits for Operation Without a Backup Pressure Regulator



**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 Limits for Technical Specification 3.2.3

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-10, Revision 0, "Nine Mile Point Unit 2 Reload 10, Reload Specific Lattice Data". This document contains the LHGR limits for both UO<sub>2</sub> 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.

**NOTE:** For operation  $\geq 30\%$  and  $< 90\%$  RTP with a backup pressure regulator out of service, additional LHGR limit requirements have been established as shown in Figure 3-11 and 3-14. There are no additional LHGR limits required for operation  $< 30\%$  and  $\geq 90\%$  RTP for operation with a backup pressure regulator out of service.



Figure 3-11

LHGR Limit for Operation Between 30% and 90% RTP  
Without a Backup Pressure Regulator  
for GE11

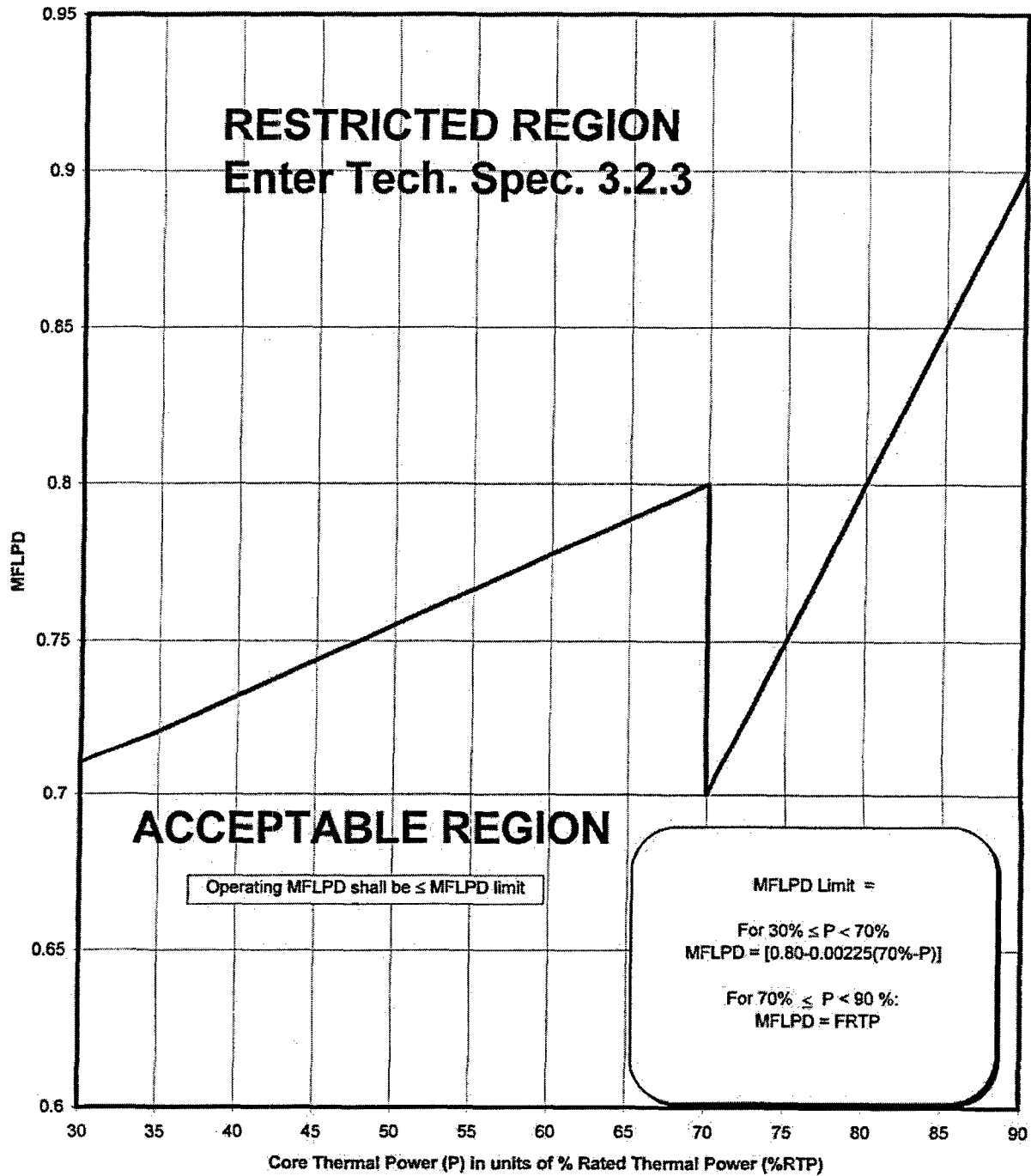
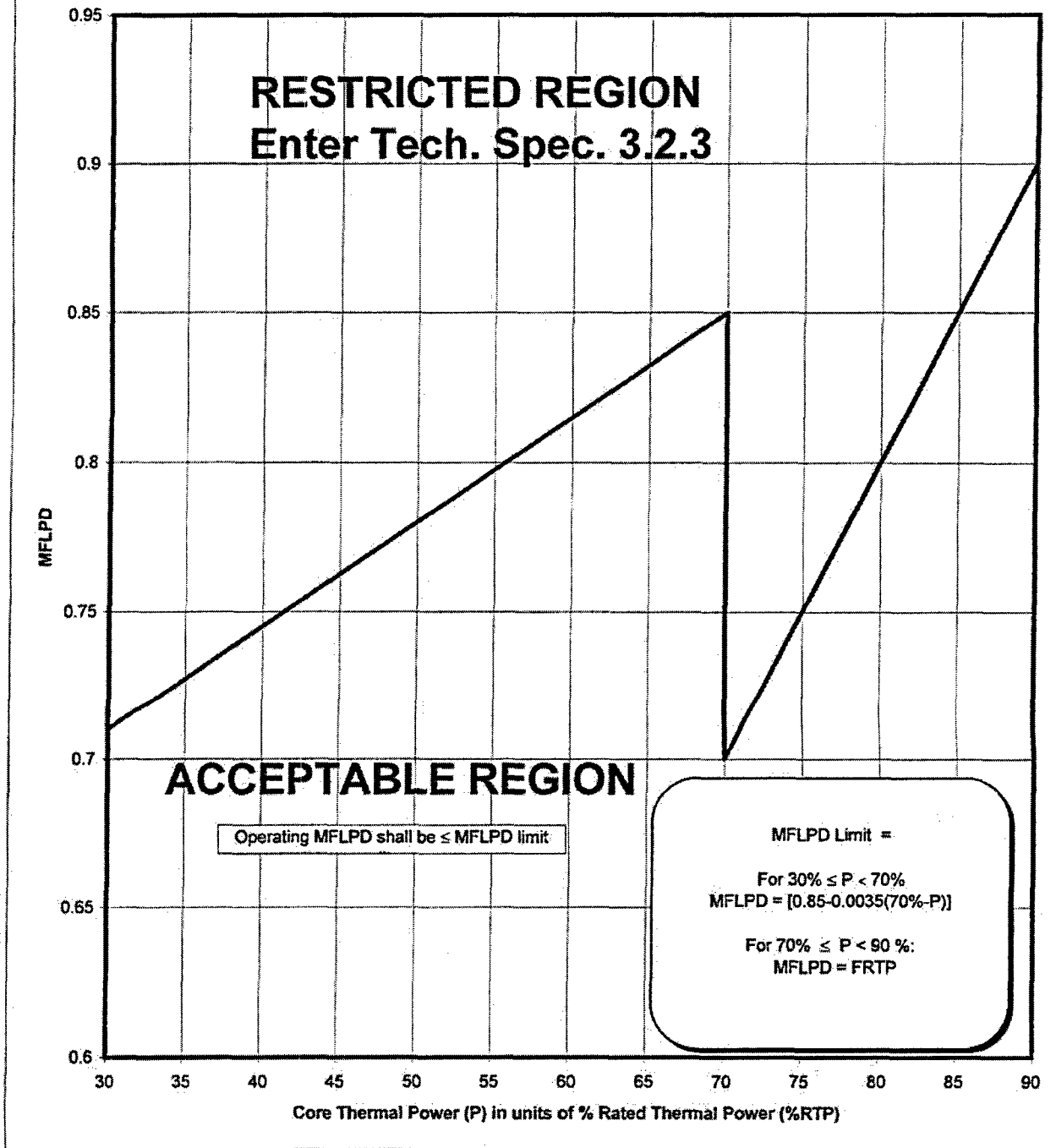


Figure 3-14

LHGR Limit for Operation Between 30% and 90% RTP  
Without a Backup Pressure Regulator  
for GE14C



**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

4.0 AVERAGE POWER RANGE MONITOR SETPOINTS

4.1 Limits for Technical Specification Table 3.3.1.1-1 (OPRM Upscale)

ALLOWABLE VALUE  $\leq 1.13$

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

5.0 ROD BLOCK MONITOR (RBM)

5.1 Allowable Value for Technical Specification Table 3.3.2.1-1

<u>Function</u>	<u>Allowable Value</u>
RBM Upscale	$\leq 0.66 (W - \Delta W) + 47\%$ with a maximum of 113%

**NOTE:** W = Loop Recirculation Flow as a percentage of the loop recirculation flow which produces a rated core flow of 108.5 MLB/HR.  $\Delta W$  is defined as the difference in indicated drive flow (in percent of drive flow which produces rated core flow) between two loop and single loop operation at the same core flow.  $\Delta W = 0$  for two loop operation.  $\Delta W = 5\%$  for single loop operation.

***NINE MILE POINT UNIT 2***  
***CORE OPERATING LIMITS REPORT***

6.0 REFERENCES FOR TECHNICAL SPECIFICATION

Technical Specification 5.6.5.b.1:  
General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15  
and NEDE 24011-P-A-15-US (September 2005).

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

7.0 REFERENCES FOR TECHNICAL SPECIFICATION BASES

2.1.1 BASES REFERENCE 3:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

2.1.1 BASES REFERENCE 4:

Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11, 0000-0023-4708-SRLR, Rev. 0, February 2006.

3.1.1 BASES REFERENCE 7:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

3.1.6 BASES REFERENCE 1:

Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11, 0000-0023-4708-SRLR, Rev. 0, February 2006.

3.2.1 BASES REFERENCE 1:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

3.2.2 BASES REFERENCE 2:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

3.2.2 BASES REFERENCE 3:

Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11, 0000-0023-4708-SRLR, Rev. 0, February 2006.

3.2.3 BASES REFERENCE 1:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

3.2.3 BASES REFERENCE 2:

Supplemental Reload Licensing Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11, 0000-0023-4708-SRLR, Rev. 0, February 2006.

3.2.4 BASES REFERENCE 3:

General Electric Standard Application for Reactor Fuel, NEDE 24011-P-A-15 and NEDE 24011-P-A-15-US (September 2005).

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

8.0 SOURCE DOCUMENTS

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

CORE OPERATING LIMIT

REFERENCE

Section 1.0 - APLHGR LIMITS

“Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11”, 0000-0050-1550-ER, Rev 0, March 2006

Section 2.0 - MCPR LIMITS

“Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11”, 0000-0050-1550-ER, Rev 0, March 2006

Section 3.0 - LHGR LIMITS

“Engineering Report for Nine Mile Point Nuclear Station Unit 2, Reload 10, Cycle 11”, 0000-0050-1550-ER, Rev 0, March 2006

**NINE MILE POINT UNIT 2**  
**CORE OPERATING LIMITS REPORT**

8.0. SOURCE DOCUMENTS (Cont)

CORE OPERATING LIMIT

REFERENCE

Section 4.0 - APRM SETPOINTS

Limits for Technical Specification  
Table 3.3.1.1-1 (OPRM Upscale)

"Engineering Report for Nine Mile Point  
Nuclear Station Unit 2, Reload 10, Cycle  
11", 0000-0050-1550-ER, Rev 0, March  
2006

Section 5.0 - RBM SETPOINTS

GE Engineering Report for Nine Mile Point  
Nuclear Station Unit 2 Reload 2 Cycle 3,  
NFD92-016 January 1992