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August 28, 2006
PY-CEI/NRR-2987L

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

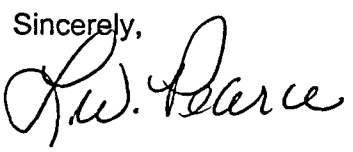
Perry Nuclear Power Plant
Docket No. 50-440

Subject: Mid-cycle Revision to the Core Operating Limits Report

Enclosed is a mid-cycle revision to the Cycle 11 Core Operating Limits Report (COLR) for the Perry Nuclear Power Plant (PNPP). A description of the purpose of the revision is provided on page i of the Enclosure. This mid-cycle revision of the COLR is submitted in accordance with Technical Specification 5.6.5, "Core Operating Limits Report."

There are no regulatory commitments contained in this letter or its Enclosure. If there are any questions or if additional information is required, please contact Mr. Gregory A. Dunn, Manager – FENOC Fleet Licensing, at (330) 315-7243.

Sincerely,



L. William Pearce

Enclosure

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III

A001

Enclosure
PY-CEI/NRR-2987L

Mid-Cycle Revision of the PNPP Core Operating Limits Report

PERRY OPERATIONS MANUAL

Plant Data Book Entry

TITLE: CORE OPERATING LIMITS REPORT FOR THE PERRY NUCLEAR POWER PLANT UNIT 1 CYCLE 11 (RELOAD 10)

PDB - F0001 /Rev. 13 MPL: J11 EFFECTIVE DATE: 8-29-06

SUMMARY OF LAST CHANGE:

Clarification of the administrative limit on MFLCPR during single loop operations.

REFERENCES: Technical Specification 5.6.5, "Core Operating Limits Report"

COMMITMENTS: None

PREPARED BY: J. Meyer 7-11-06
Date

UNIT 1 CORE OPERATING LIMITS REPORT

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UNIT 1 CORE OPERATING LIMITS REPORT

INDEX (Continued)

INTRODUCTION AND REFERENCES

INTRODUCTION

This Core Operating Limits Report for PNPP Unit 1 Cycle 11 is prepared in accordance with the requirements of PNPP Technical Specification Administrative Controls 5.6.5. The core operating limits presented were developed using NRC-approved methods (Reference 2). Results from the reload analysis for the General Electric fuel in PNPP Unit 1 for Cycle 11 are documented in References 3, 4 and 15.

The cycle-specific core operating limits for the following PNPP Unit 1 Technical Specifications are included in this report:

1. Average Planar Linear Heat Generation Rate (APLHGR) Limits for each fuel/lattice type, including the power and flow dependent MAPFAC curves with the single loop MAPLHGR reduction factor. (Technical Specification 3.2.1)

2. Minimum Critical Power Ratio Operating Limit including the power and flow dependent MCPR curves for Two Loop Operation and Single Loop Operation. (Technical Specification 3.2.2)

   Additional power dependent MCPR curves for Two Loop Operation and Single Loop Operation are provided for operation with one pressure regulator out of service.

3. Linear Heat Generation Rate (LHGR) Limits for each fuel/lattice type, including the power and flow dependent MAPFAC curves with the single loop MAPLHGR reduction factor. (Technical Specification 3.2.3)

4. The simulated thermal power time constant. (Technical Specification 3.3.1.1, SR 3.3.1.1.14)

5. Oscillation Power Range Monitor (OPRM) Instrumentation. (Technical Specification 3.3.1.3)

REFERENCES

1. Perry Nuclear Power Plant Updated Safety Analysis Report, Unit 1, Appendix 15B-Reload Safety Analysis.

2. "General Electric Standard Application for Reactor Fuel-GESTAR II", NEDE-24011-P-A-14 and NEDE-24011-P-A-14-US (US Supplement), June 2000.

3. "Supplemental Reload Licensing Report for Perry Nuclear Power Plant Unit 1 Reload 10 Cycle 11", GNF Document 0000-0028-4692SRLR, Rev 1, March 2005.

4. "Fuel Bundle Information Report for Perry Nuclear Power Plant Unit 1 Reload 10 Cycle 11", GNF Document 0000-0028-4692FBIR, Rev 0, December 2004.

5. License Amendment No. 61 to Facility Operating License NPF - 58, June 2, 1994.

6. Generic Letter 88-16, "REMOVAL OF CYCLE-SPECIFIC PARAMETERS FROM TECHNICAL SPECIFICATIONS".

7. Technical Specification 3.2.1, Average Planar Linear Heat Generation Rate.

8. Technical Specification 3.2.2, Minimum Critical Power Ratio.

9. Technical Specification 3.2.3, Linear Heat Generation Rate.

10. Technical Specification 3.3.1.1, Reactor Protection System Instrumentation.

11. Technical Specification 5.6.5, Core Operating Limits Report.

12. Technical Specification 2.1.1.2, Safety Limit MCPR.

13. License Amendment No. 33 to Facility Operating License NPF - 58, September 13, 1990.

14. License Amendment 112 to Facility Operating License NPF-58, June 1, 2000.

15. "Supplemental Reload Licensing Report for Perry Nuclear Power Plant Unit 1 Reload 8 Cycle 9", GNF Document J11-03754SRLR, Rev 1, January 2003.

16. CR 03-01377, "Equation for OL MCPR(P) in the Core Operating Limits Report is Suspect."

17. License Amendment 132, Perry Nuclear Power Plant, Unit 1 - Issuance of Amendment RE: Revision of the Minimum Critical Power Ratio Safety Limit (TAC No. MC 2599), February 3, 2005.

18. License Amendment 134, Perry Nuclear Power Plant, Unit 1 - Issuance of Amendment RE: Single Recirculation Loop Operation (TAC No. MC 4224), March 31, 2005.

19. Calculation FM-012, OPRM Device Settings and Setpoints, Revision 1, Addendum A-01.

AVERAGE PLANAR LINEAR HEAT GENERATION RATE (TS 3.2.1)

All AVERAGE PLANAR LINEAR HEAT GENERATION RATES (APLHGRs) shall not exceed the result obtained from multiplying the applicable MAPLHGR limits* by the smaller of either the flow dependent MAPLHGR factor ($MAPFAC_f$) Figure 3.2.1-1 or the power dependent MAPLHGR factor ($MAPFAC_p$) Figure 3.2.1-2.

The following table lists the MAPLHGR limits as a function of exposure for GE14 fuel:

Exposure (GWD/st)	ECCS MAPLHGR Limit (KW/FT)
0.00	12.82
14.51	12.82
19.13	12.82
57.61	8.00
63.50	5.00

NOTE: MAPLHGR Limits are defined in Reference 3. $MAPFAC_f$ and $MAPFAC_p$ are defined in Reference 15.

NOTE: The Single Loop Operation limits take effect when reset for single loop operation per LCO 3.4.1,"Recirculation Loops Operating". This is consistent with note "(b)" to Table 3.3.1.1-1 of the Technical Specifications. Use FTI-B0012 Single Loop Operation to implement the revised MAPLHGR Limits.

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* These applicable MAPLHGR limits are:

1. Those for the respective fuel as a function of the average planar exposure (as described by the NRC approved methodology described in GESTAR-II)

or,

2. When hand calculations are required, the MAPLHGR limit as a function of the average planar exposure as shown in Figures 3.2.1-3 (GE14).

Flow Dependent MAPLHGR Factor ($MAPFAC_f$), Fuel Type GE14

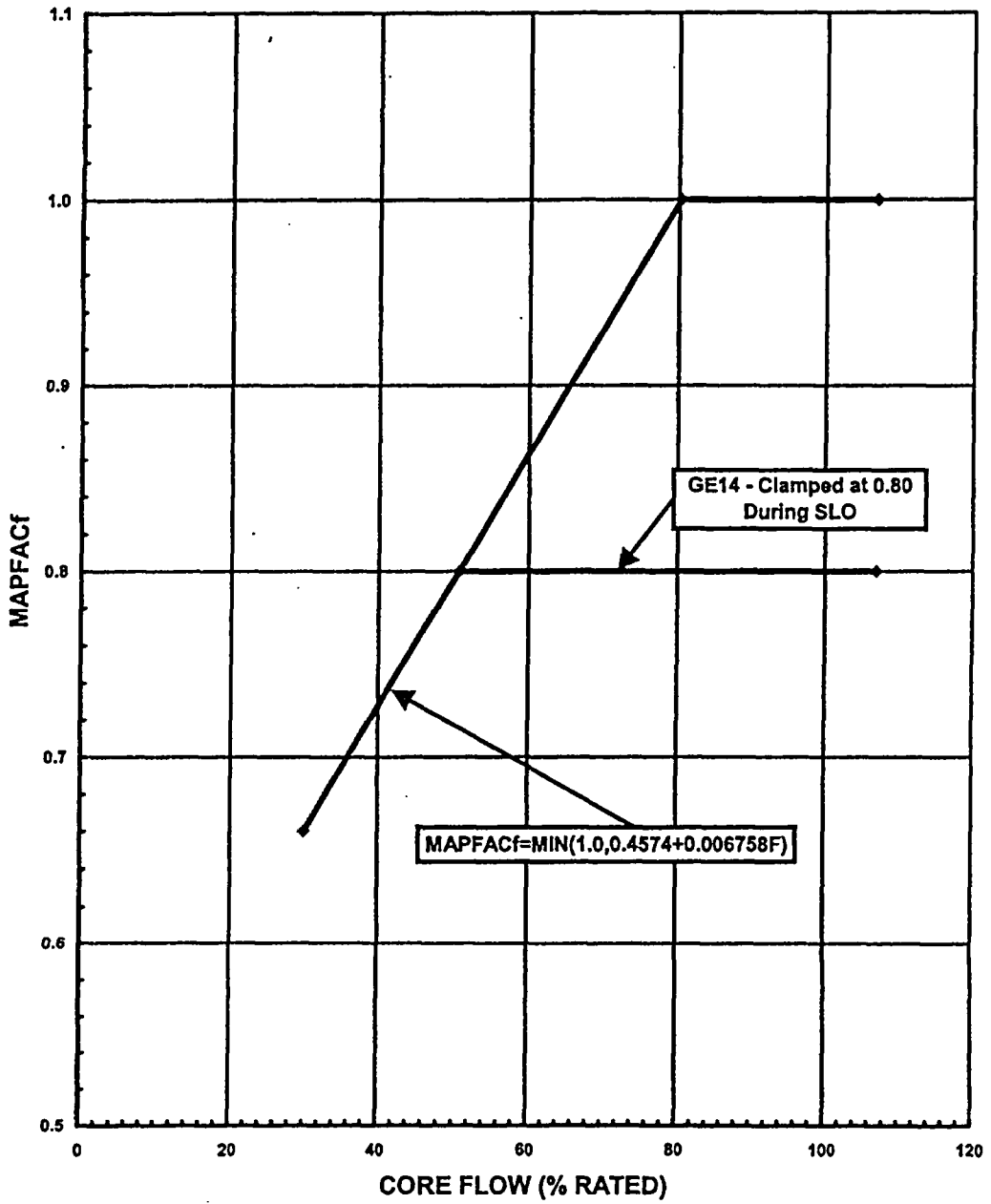


Figure 3.2.1-1

Power Dependent MAPLHGR Factor ($MAPFAC_p$), Fuel Types GE14

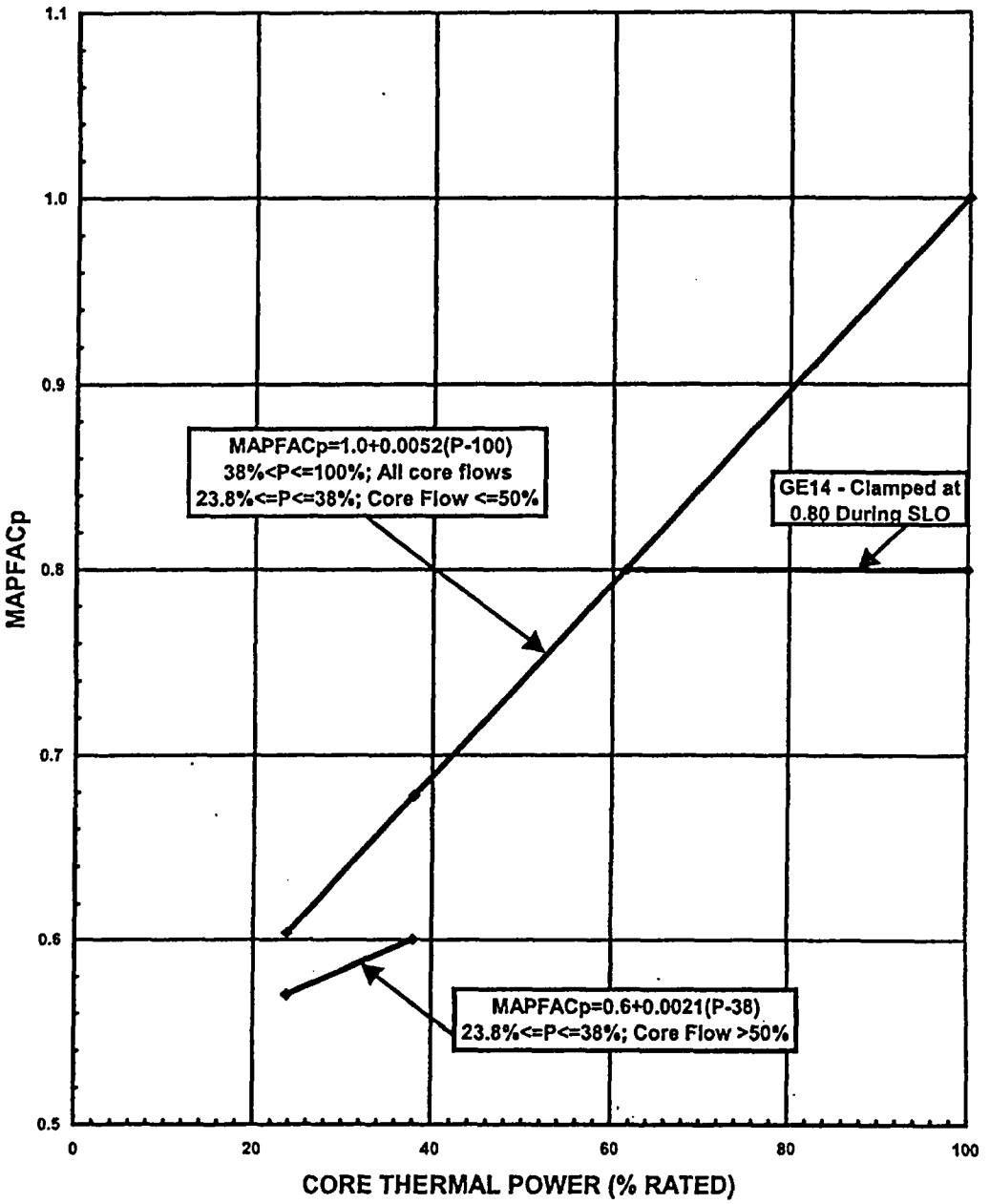
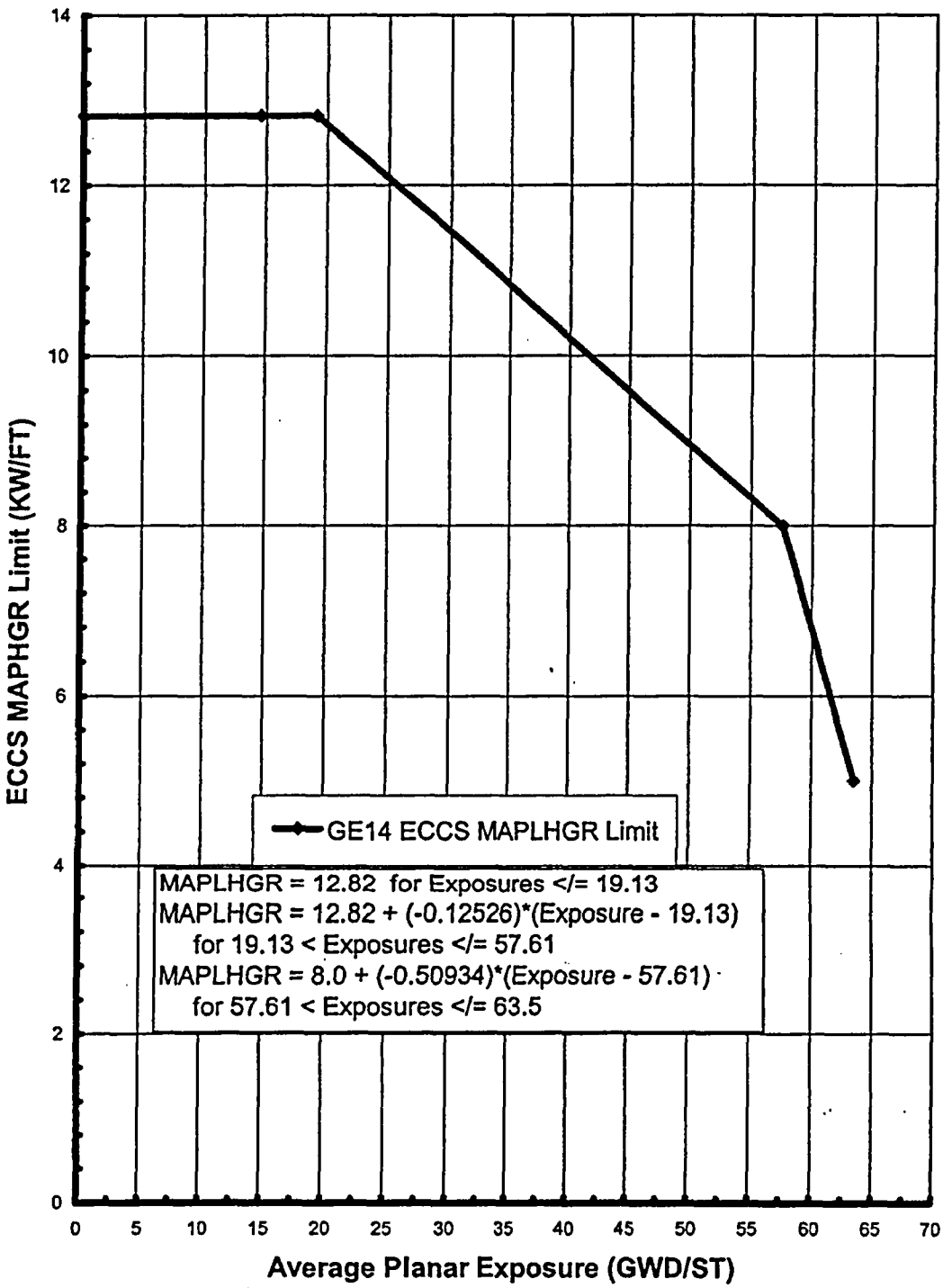


Figure 3.2.1-2

MAPLHGR Versus Average Planar Exposure, Fuel Type GE14



NOTE: 1. Intermediate MAPLHGR values are obtained by linear interpolation between adjacent points.

Figure 3.2.1-3

MINIMUM CRITICAL POWER RATIO (TS 3.2.2)

The MINIMUM CRITICAL POWER RATIO (MCPR) shall be equal to or greater than the higher of the $MCPR_f$ and $MCPR_p$ limits at the indicated core flow and THERMAL POWER as specified in Figures 3.2.2-1 and 3.2.2-2 for Two Loop Operation and Figures 3.2.2-3 and 3.2.2-4 for Single Loop Operation.

The MCPR Safety Limit for Cycle 11 is 1.08 and the MCPR Safety Limit for Single Loop Operation is 1.10 <TECHNICAL SPECIFICATIONS 2.1.1.2> (Reference 3 and 17). During Single Loop Operation with 3D MONICORE monitor in "2 LOOPS ON" mode, the Maximum Fraction of Limiting Critical Power Ratio (MFLCPR) shall be equal to or less than 0.98. Use FTI-B0012 Single Loop Operation to implement this revised MFLCPR.

NOTE 1: For Cycle 11 no change to MCPR limits is required for planned reduction of feedwater temperature to as low as 325.5°F. Final feedwater temperature may be reduced to 255.5°F after all control rods are withdrawn at the end of cycle if the OPRMs are OPERABLE.

NOTE 2: Planned reduction of rated feedwater temperature from nominal rated feedwater temperature is not permitted during plant operation with the reactor recirculation system in Single Loop Operation, if the OPRMs are operable.

NOTE 3: Figures 3.2.2-1 and 3.2.2-2 depict the limiting fuel type for Two Loop Operation. Figures 3.2.2-3 and 3.2.2-4 depict the limiting fuel type for Single Loop operation. Specific values are found in References 3 and 15.

Figures 3.2.2-5 and 3.2.2-6 depict power dependent MCPR curves for Two Loop Operation and Single Loop Operation for operation with one pressure regulator out of service. This may be implemented as either a change to the core monitoring software or appropriate administrative limit.

Figure 3.2.2-7 depicts implementing an administrative limit to the Maximum Fraction Limiting Critical Power Ratio with One Pressure Regulator Out Of Service.

In the case where a Pressure Regulator is out of service and the plant is in Single Loop Operations, limit MFLCPR to the smaller of 0.98 and Figure 3.2.2-7, MFLCPR Limit With One Pressure Regulator Out Of Service.

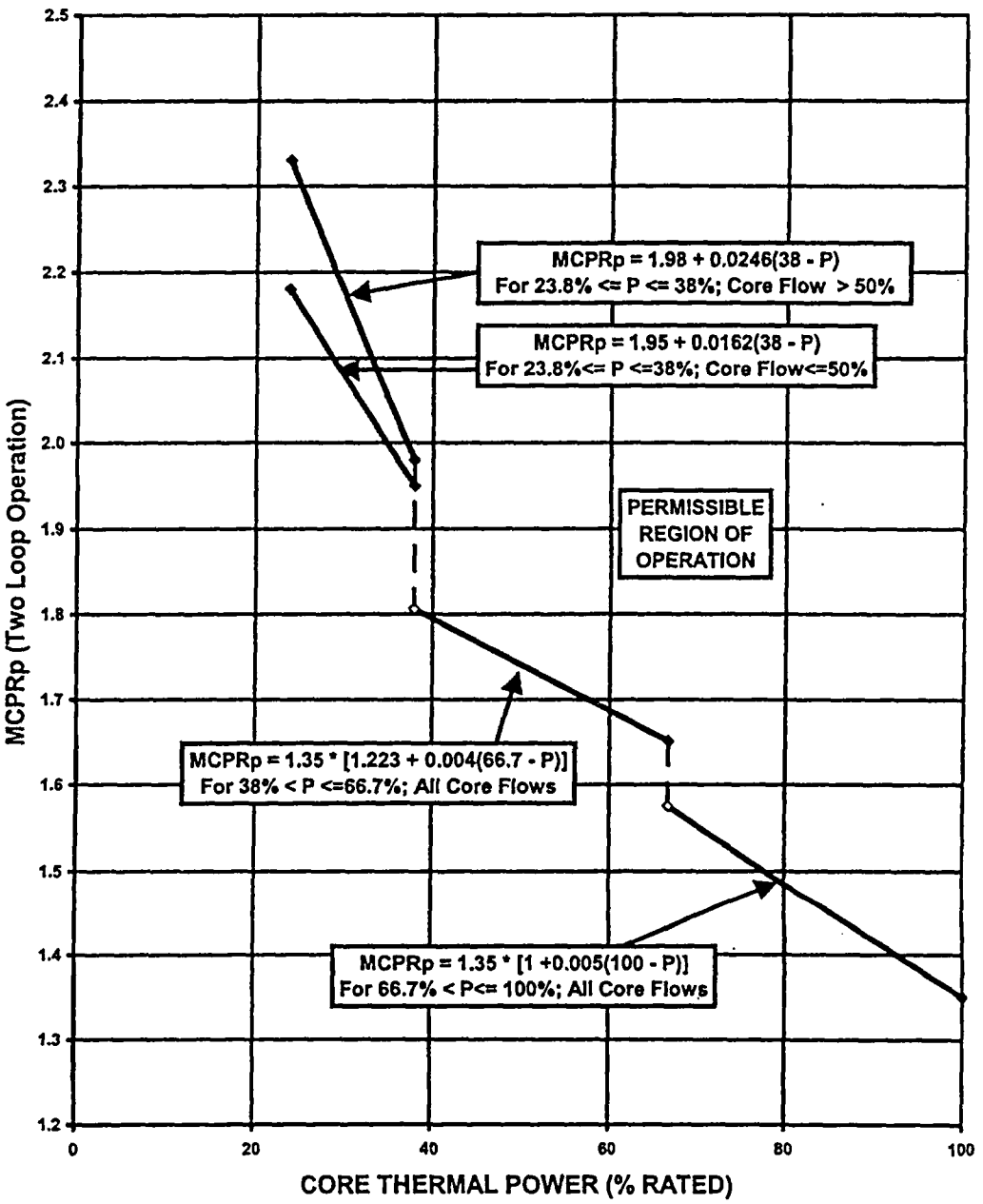
NOTE 4: There are a total of 19 safety/relief valves, the two lowest setpoint valves are assumed to be out-of-service in the transient analysis.

NOTE 5: The MCPR operating limit is increased 0.02 to account for the increase in the single loop MCPR safety limit with the reactor recirculation system in Single Loop Operation.

NOTE 6: The Single Loop Operation limits take effect when reset for Single Loop Operation per LCO 3.4.1, "Recirculation Loops Operating". This is consistent with note "(b)" to Table 3.3.1.1-1 of the Technical Specifications.

NOTE 7: The standard off-rated limits established as part of the GE14 new fuel introduction from Cycle 9 are applicable for the current Cycle 11 with the appropriate scaling. The SLMCPR basis for MCPR(P) limits below Pbypass for GE14 is 1.10, and the MCPR(F) coefficients are based on a SLMCPR of 1.07. Therefore, scaling of (1.08/1.10) was applied to the MCPR(P) graphs and scaling of (1.08/1.07) is applied to MCPR(F) coefficients to account for the changes in the SLMCPR (Reference 3).

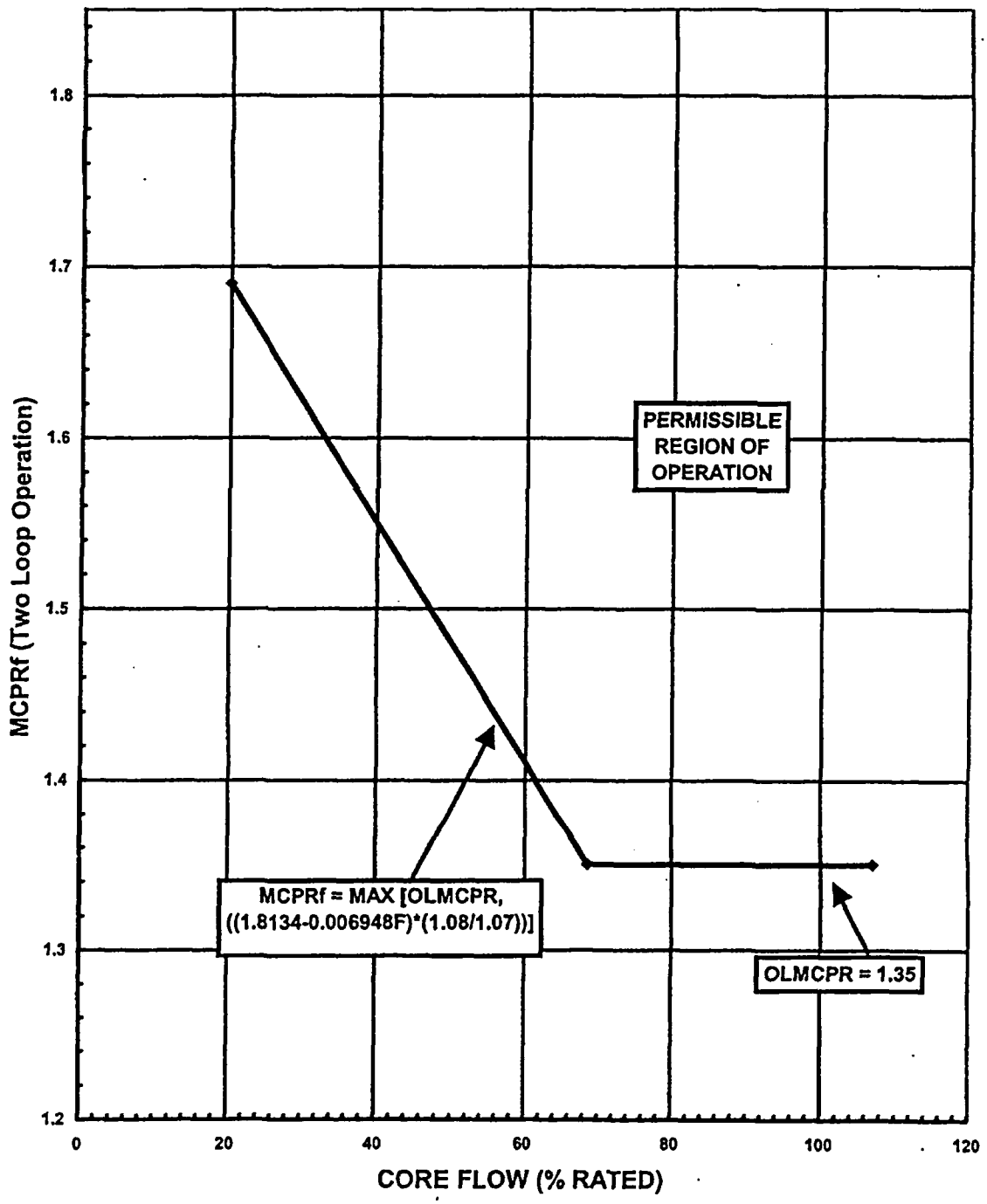
Power Dependent MCPR Limit ($MCPR_p$),
Fuel Type GE14 (Two Loop Operation)*



* Refer to NOTE 3 on Page 9

Figure 3.2.2-1

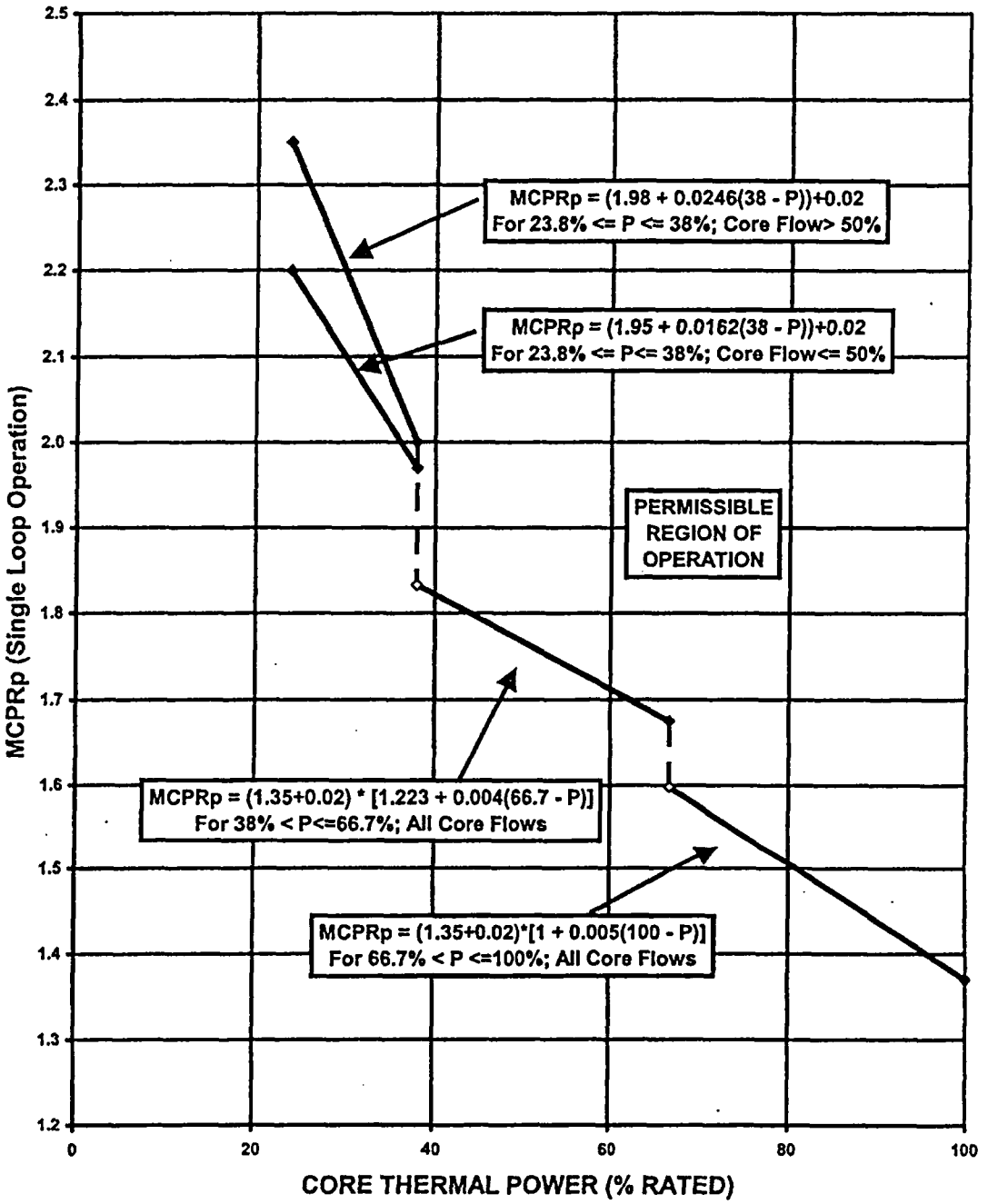
Flow Dependent MCPR Limit ($MCPR_f$),
Fuel Type GE14 (Two Loop Operation)*



* Refer to NOTE 3 on Page 9 and Note 7 on Page 10

Figure 3.2.2-2

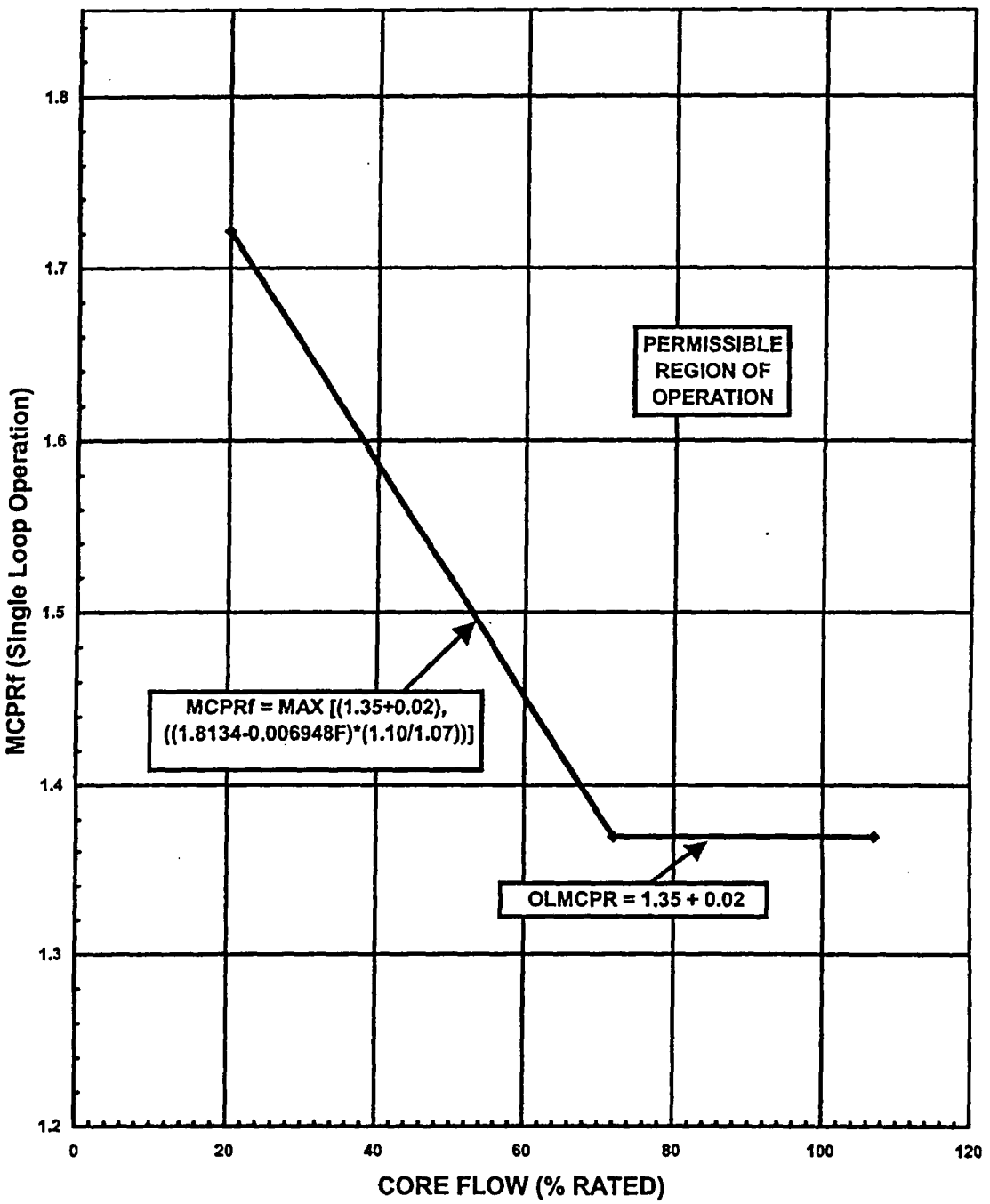
Power Dependent MCPR Limit ($MCPR_p$),
Fuel Type GE14 (Single Loop Operation)*



* Refer to NOTE 3 and NOTE 5 on Page 9

Figure 3.2.2-3

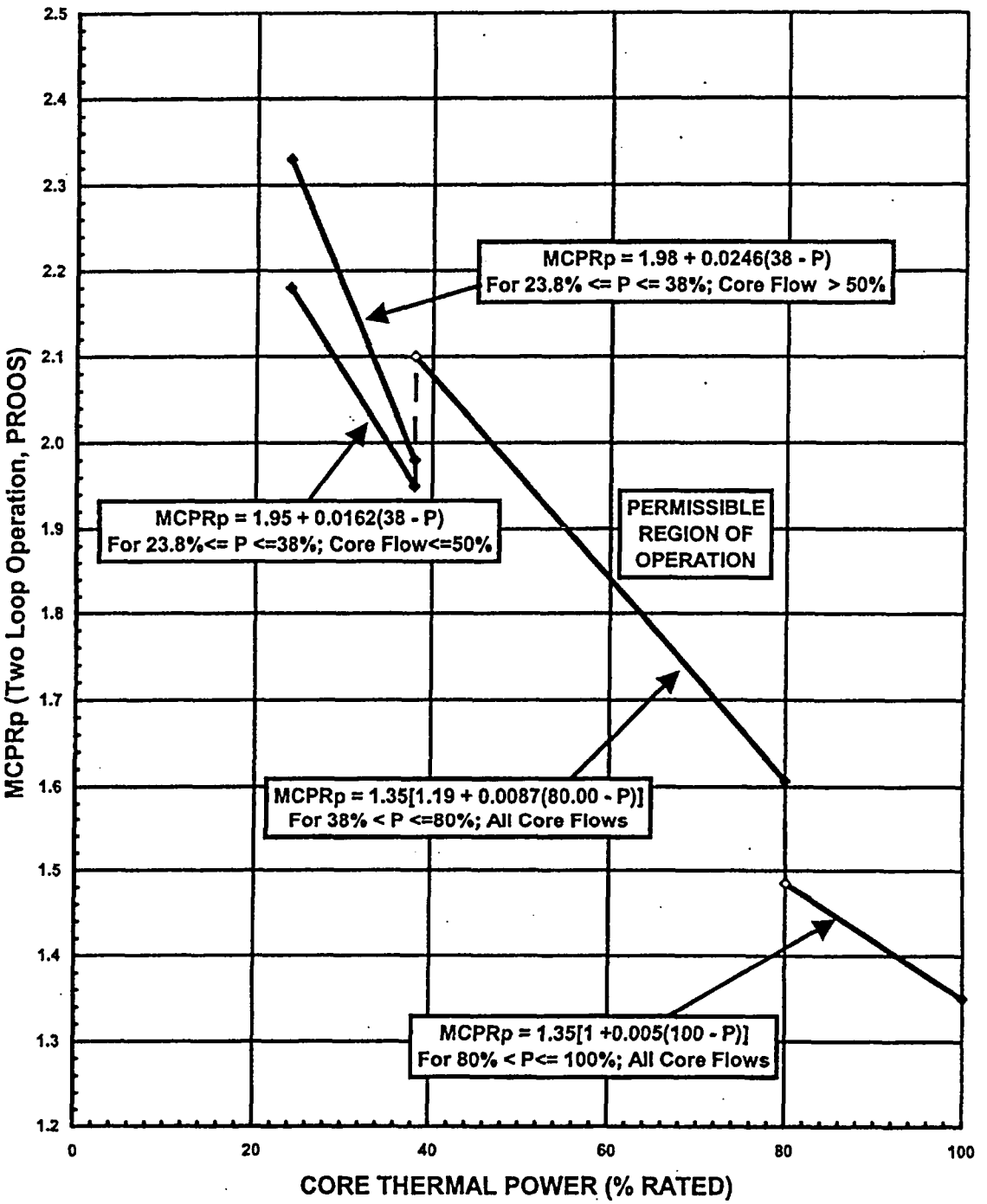
Flow Dependent MCPR Limit ($MCPR_f$),
Fuel Type GE14 (Single Loop Operation)*



* Refer to NOTE 3 and NOTE 5 on Page 9 and Note 7 on Page 10.

Figure 3.2.2-4

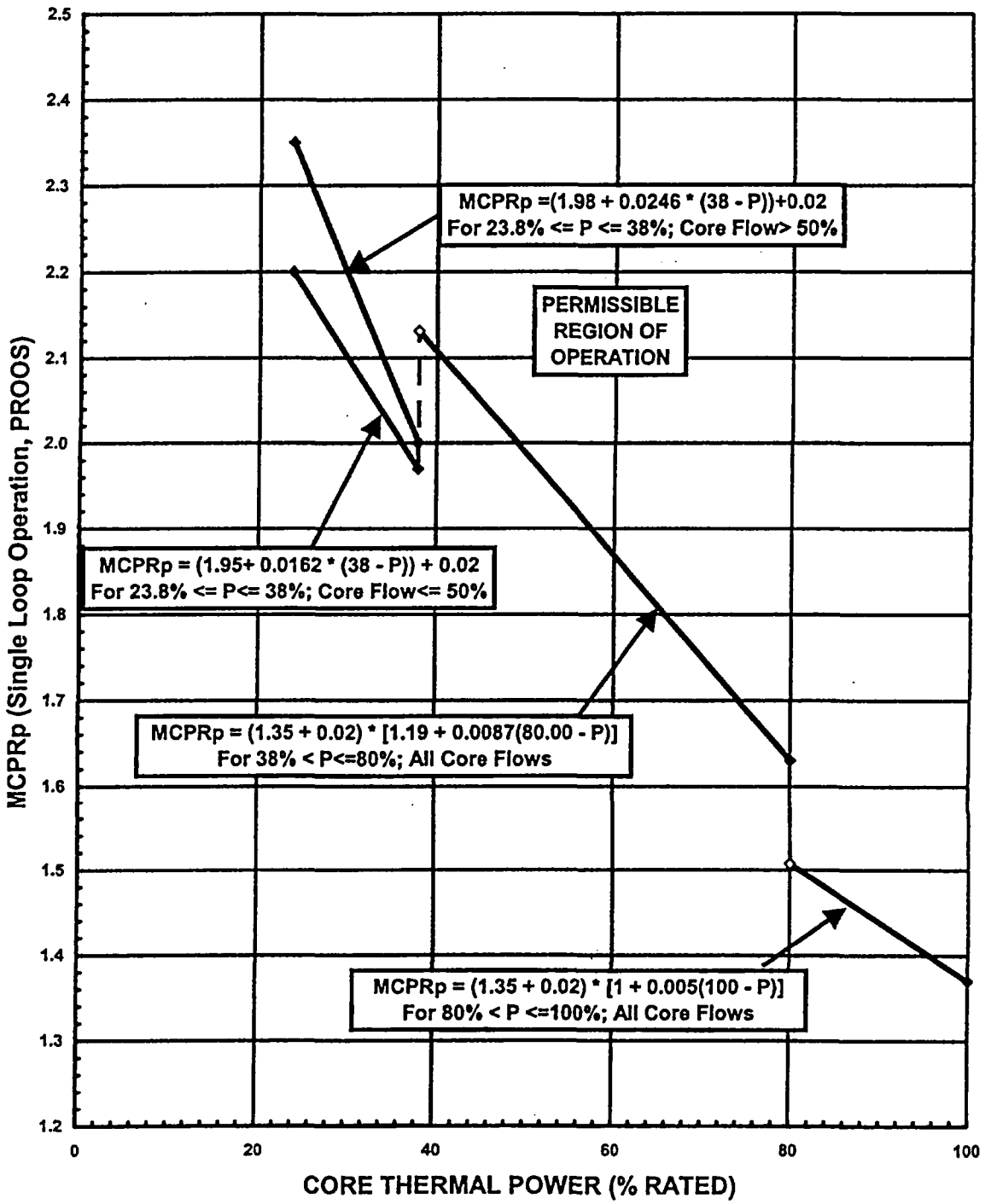
Power Dependent MCPR Limit ($MCPR_p$), Fuel Type GE14 (Two Loop Operation)*
Pressure Regulator Out Of Service



* Refer to NOTE 3 on Page 9

Figure 3.2.2-5

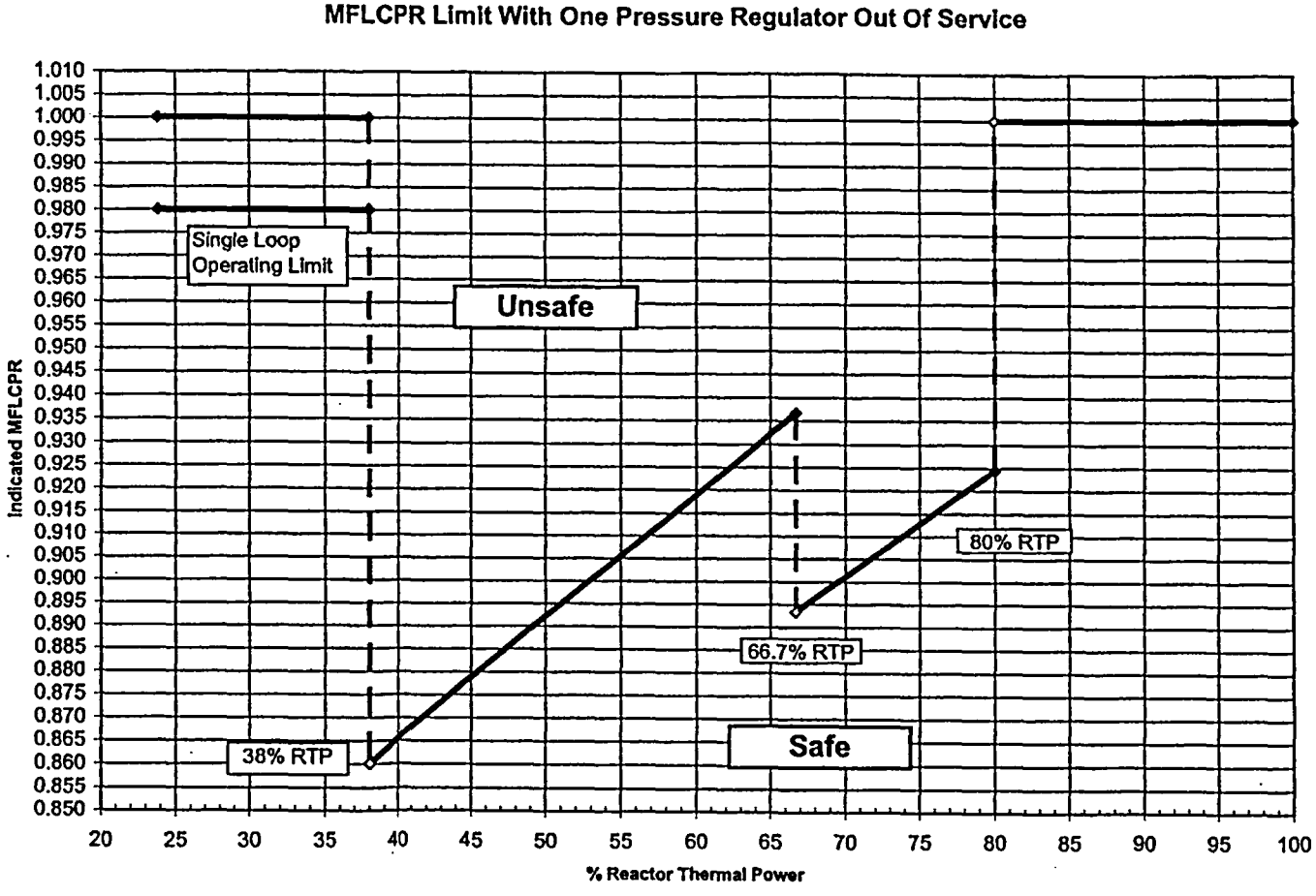
Power Dependent MCPR Limit ($MCPR_p$), Fuel Type GE14 (Single Loop Operation)*
Pressure Regulator Out Of Service



* Refer to NOTE 3 and NOTE 5 on Page 9

Figure 3.2.2-6

Maximum Fraction Limiting Critical Power Ratio Limit (MFLCPR), Fuel Type GE14 With One Pressure Regulator Out Of Service



* Refer to NOTE 3 and NOTE 5 on Page 9

Figure 3.2.2-7

LINEAR HEAT GENERATION RATE (TS 3.2.3)

All LINEAR HEAT GENERATION RATES (LHGRs) shall not exceed the result obtained from multiplying the applicable LHGR values* by the smaller of either the flow dependent MAPLHGR factor ($MAPFAC_f$) Figure 3.2.1-1 or the power dependent MAPLHGR factor ($MAPFAC_p$) Figure 3.2.1-2.

NOTE: LHGR Limits are defined in Reference 4. $MAPFAC_f$ and $MAPFAC_p$ are defined in Reference 15.

NOTE: The Single Loop Operation limits take effect when reset for single loop operation per LCO 3.4.1,"Recirculation Loops Operating". This is consistent with note "(b)" to Table 3.3.1.1-1 of the Technical Specifications. Use FTI-B0012 Single Loop Operation to implement the revised LHGR Limits.

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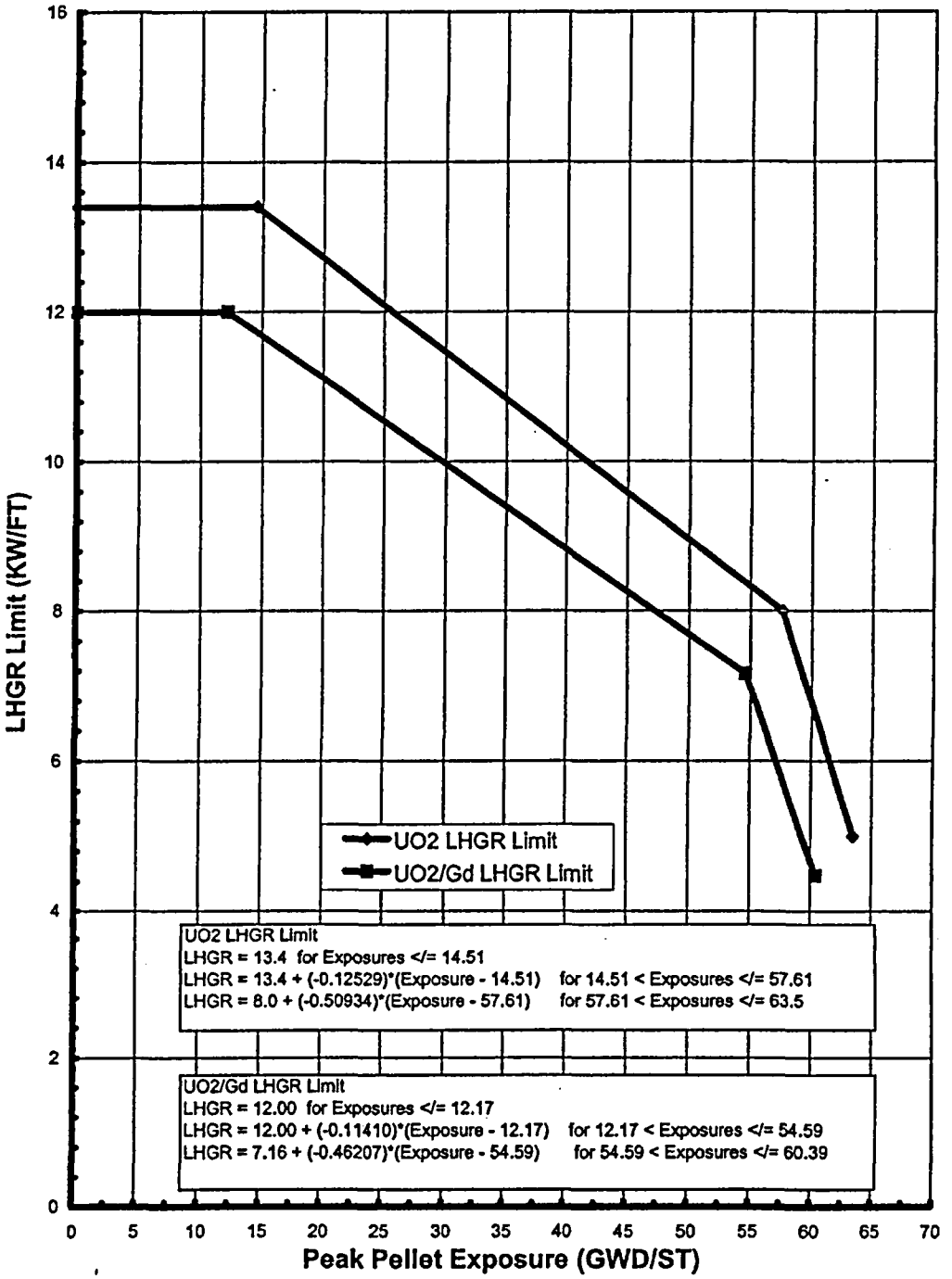
* These applicable LHGR values are:

1. Those for the respective fuel type and Gadolinium content as a function of the average planar exposure (as described by the NRC approved methodology described in GESTAR-II)

or,

2. When hand calculations are required, the LHGR as a function of the average planar exposure shown in Figures 3.2.3-1 (GE14).

LHGR Versus Average Planar Exposure, Fuel Type GE14



NOTE: 1. Intermediate LHGR values are obtained by linear interpolation between adjacent points.

Figure 3.2.3-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION (TS 3.3.1.1)

The simulated thermal power time constant shall be 6+/-0.6 seconds.

OSCILLATION POWER RANGE MONITOR (OPRM) INSTRUMENTATION (TS 3.3.1.3)

These are the Cycle 11 OPRM setpoints for operable OPRMs.

Current Settings:

1. Confirmation Count Setpoint ($N_p = N_2$): 10

2. Amplitude Setpoint (Sp): 1.07

Reference: Calculation: FM-012, Revision 1, Addendum A-01