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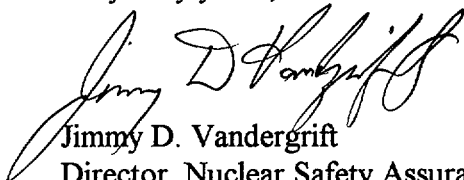
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Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
ANO-1 Cycle 17 COLR

Gentlemen:

Arkansas Nuclear One – Unit 1 (ANO-1) Technical Specification 6.12.3 requires the submittal of the Core Operating Limits Report (COLR) for each reload cycle. Attached is Revision 0 of the ANO-1 Cycle 17 COLR. Please note that the approved revision number of the Babcock and Wilcox Topical Report BAW-10179P-A is identified in the COLR as October 1999. This completes the reporting requirement for the referenced specification. This submittal contains no commitments. Should you have any questions, please contact me.

Very truly yours,



Jimmy D. Vandergrift
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JDV/nbm
Attachment

A001

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ENTERGY OPERATIONS
ARKANSAS NUCLEAR ONE - UNIT ONE
CYCLE 17
CORE OPERATING LIMITS REPORT

1.0 CORE OPERATING LIMITS

This Core Operating Limits Report for ANO-1 Cycle 17 has been prepared in accordance with the requirements of Technical Specification 6.12.3. The core operating limits have been developed using the methodology provided in the references.

The following cycle - specific core operating limits are included in this report:

- 1) Regulating control rod position setpoints,
- 2) Reactor power imbalance setpoints,
- 3) LOCA limited maximum allowable linear heat rate limits,
- 4) Axial power imbalance protective limits,
- 5) Protection system maximum allowable setpoints for axial power imbalance,
- 6) Variable Low RCS Pressure-Temperature (P-T) Protective Limits,
- 7) RCS Pressure-Temperature (P-T) Protective Maximum Allowable Setpoints,
- 8) KW/ft limit for axial power imbalance protective limits,
- 9) Minimum shutdown margin,
- 10) Axial power shaping rod insertion limits and setpoints,
- 11) Quadrant power tilt limits,
- 12) Design Nuclear Power Peaking Factors.

2.0 REFERENCES

1. "Safety Criteria and Methodology for Acceptable Cycle Reload Analysis," BAW-10179P-A, Rev. 3, Framatome Cogema Fuels, Lynchburg, Virginia, October 1999.

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Figure is referred to by
Technical Specification 3.5.2.5

Figure 1-A Rod Position Setpoints for Four-Pump Operation
From 0 to 200 ± 10 EFPD

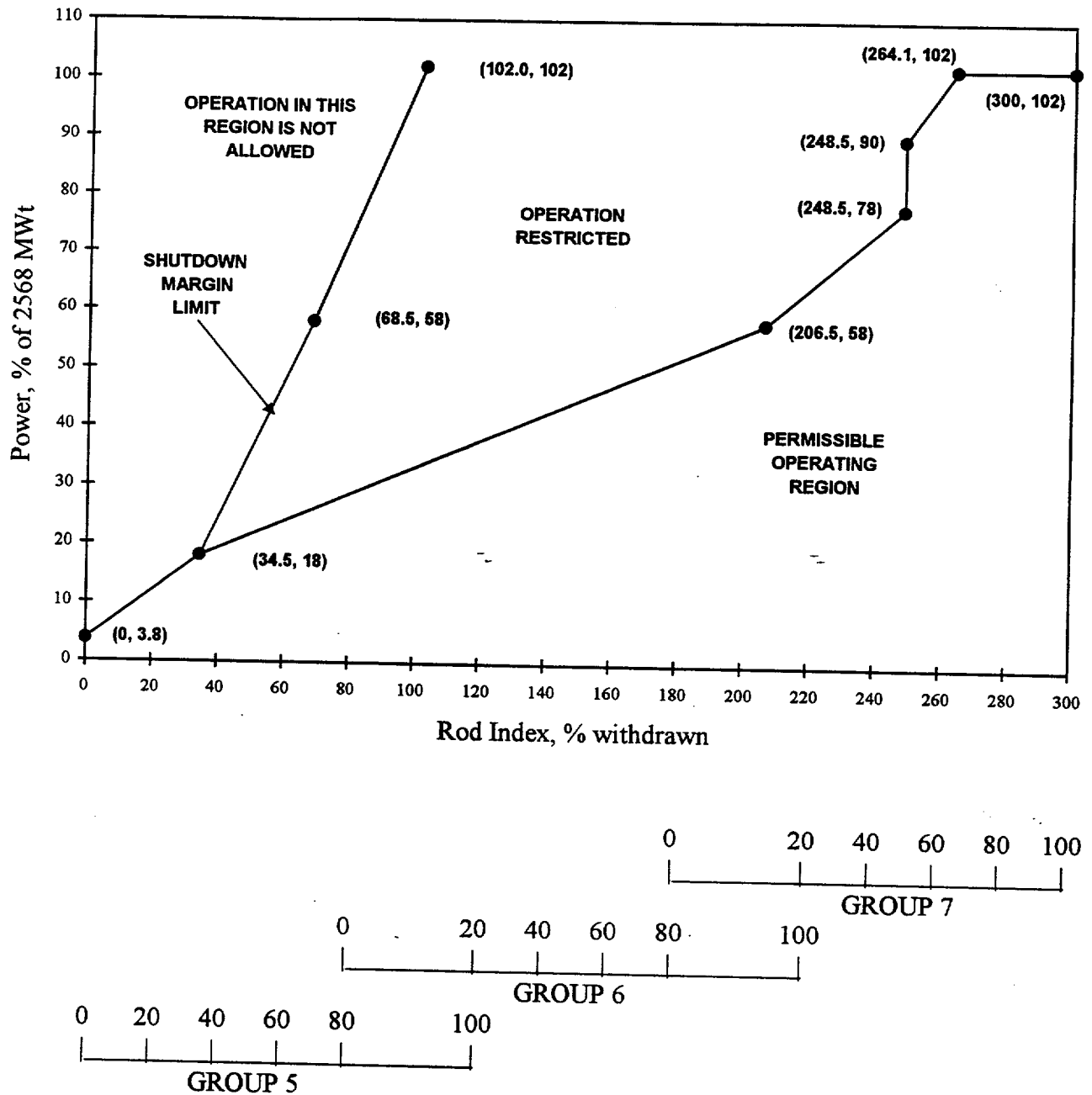


Figure is referred to by
Technical Specification 3.5.2.5

**Figure 1-B Rod Position Setpoints for Four-Pump Operation
From 200 ± 10 EFPD to EOC**

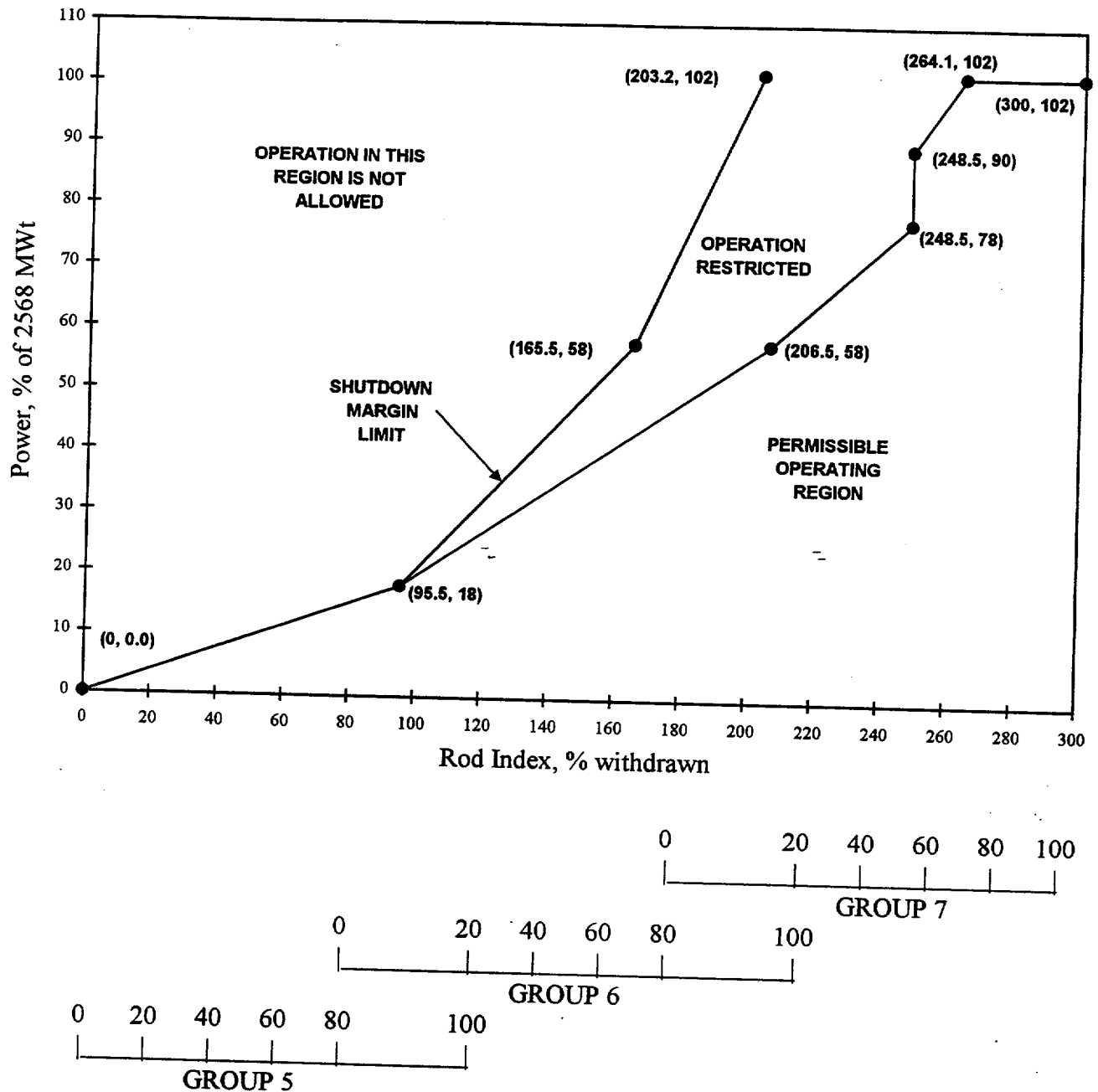


Figure is referred to by
Technical Specification 3.5.2.5

**Figure 2-A Rod Position Setpoints for Three-Pump Operation
From 0 to 200 ± 10 EFPD**

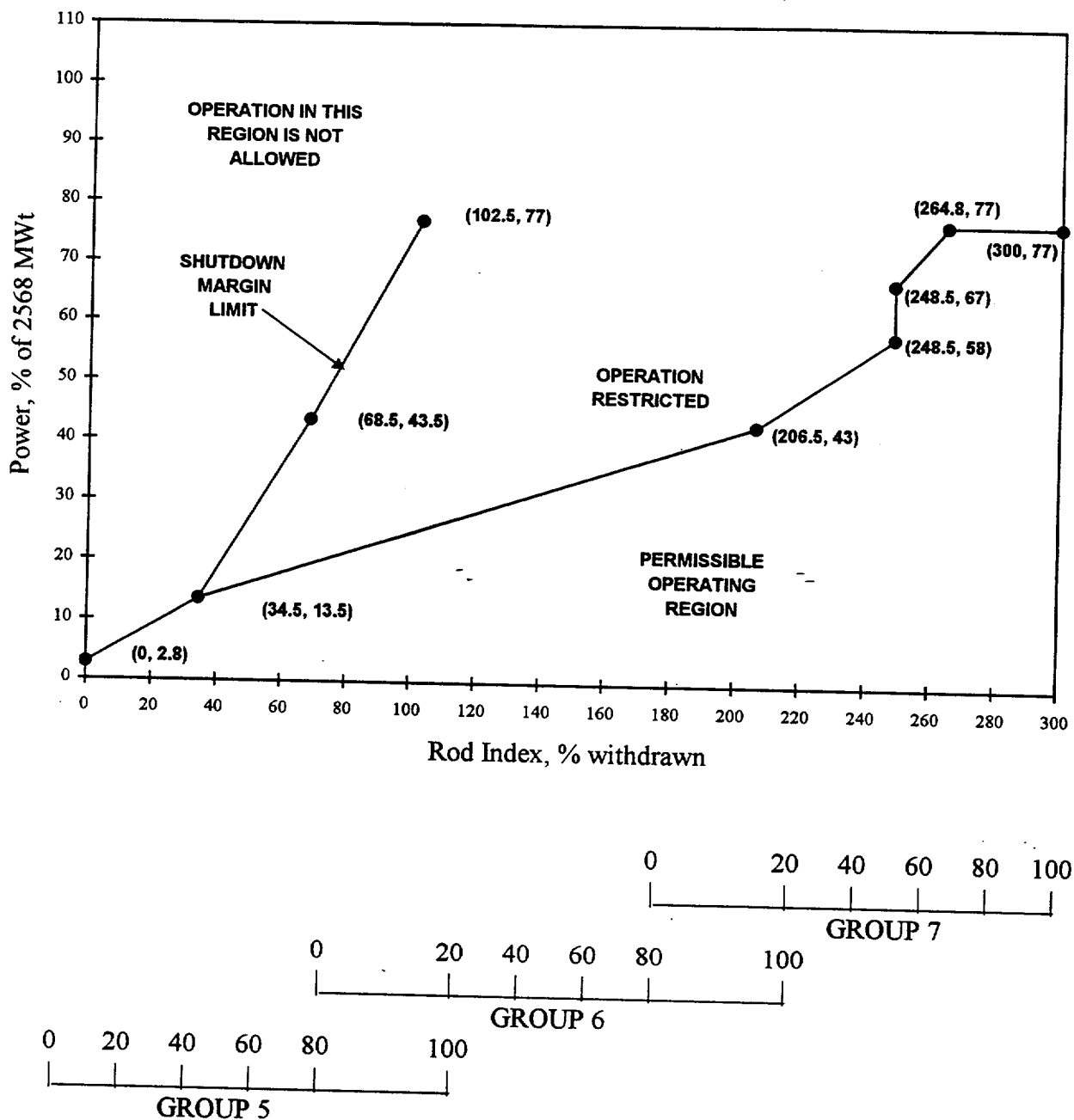


Figure is referred to by
Technical Specification 3.5.2.5

**Figure 2-B Rod Position Setpoints for Three-Pump Operation
From 200 ± 10 EFPD to EOC**

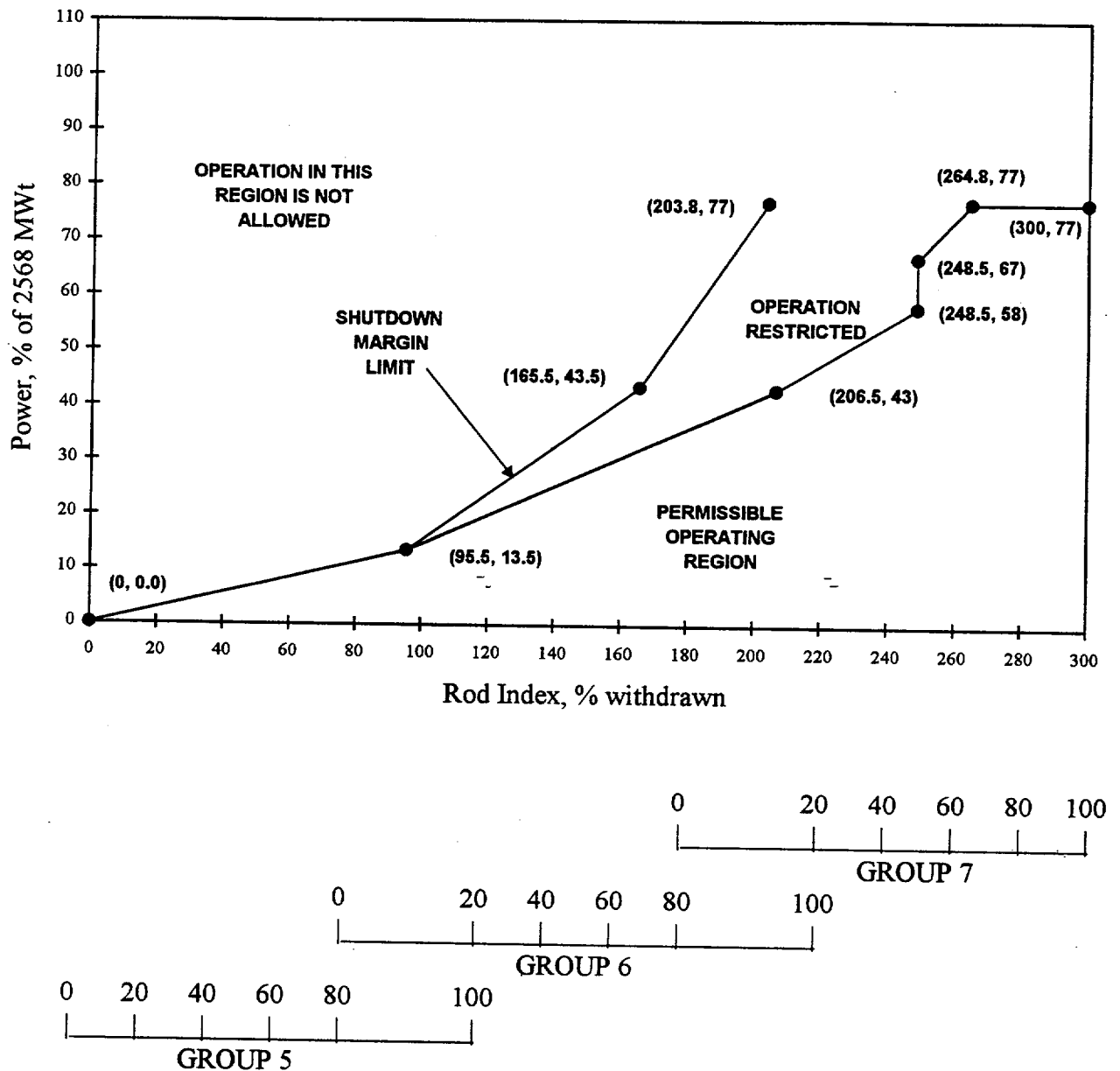


Figure is referred to by
Technical Specification 3.5.2.5

**Figure 3-A Rod Position Setpoints for Two-Pump Operation
From 0 to 200 ± 10 EFPD**

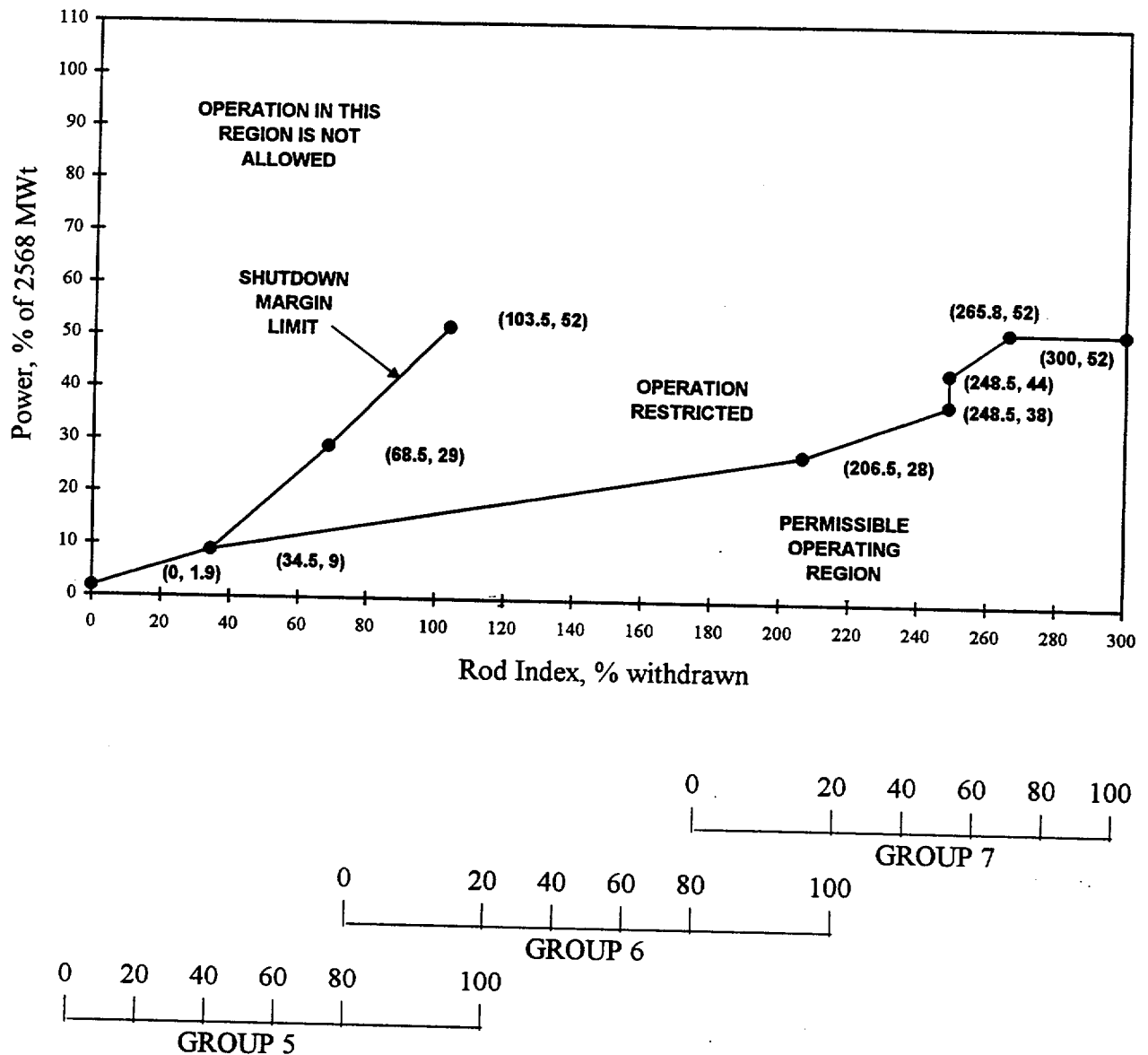


Figure is referred to by
Technical Specification 3.5.2.5

**Figure 3-B Rod Position Setpoints for Two-Pump Operation
From 200 ± 10 EFPD to EOC**

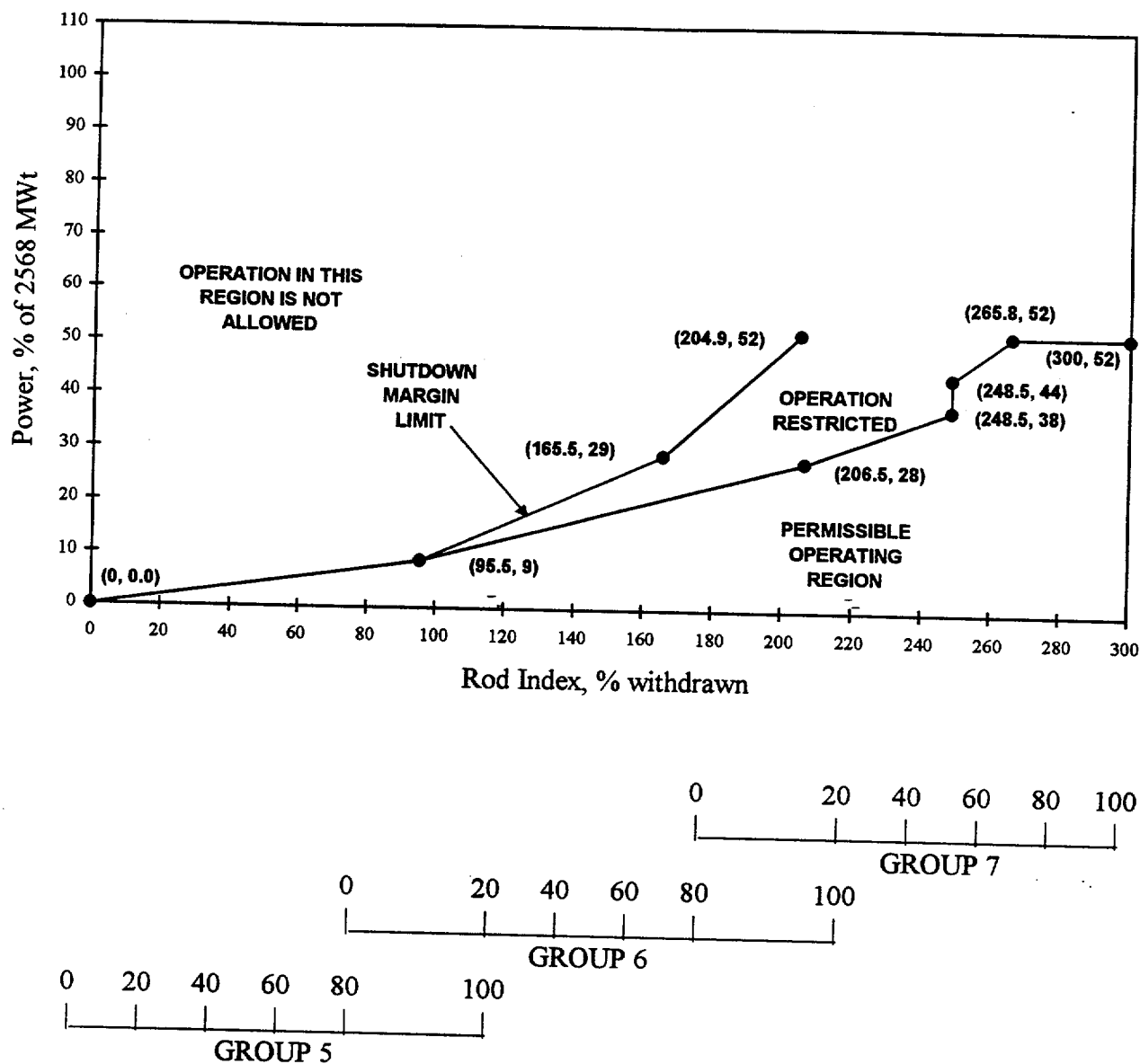


Figure is referred to by
Technical Specification 3.5.2.6

Figure 4 **Operational Power Imbalance Setpoints for Four-Pump
Operation From 0 EFPD to EOC**

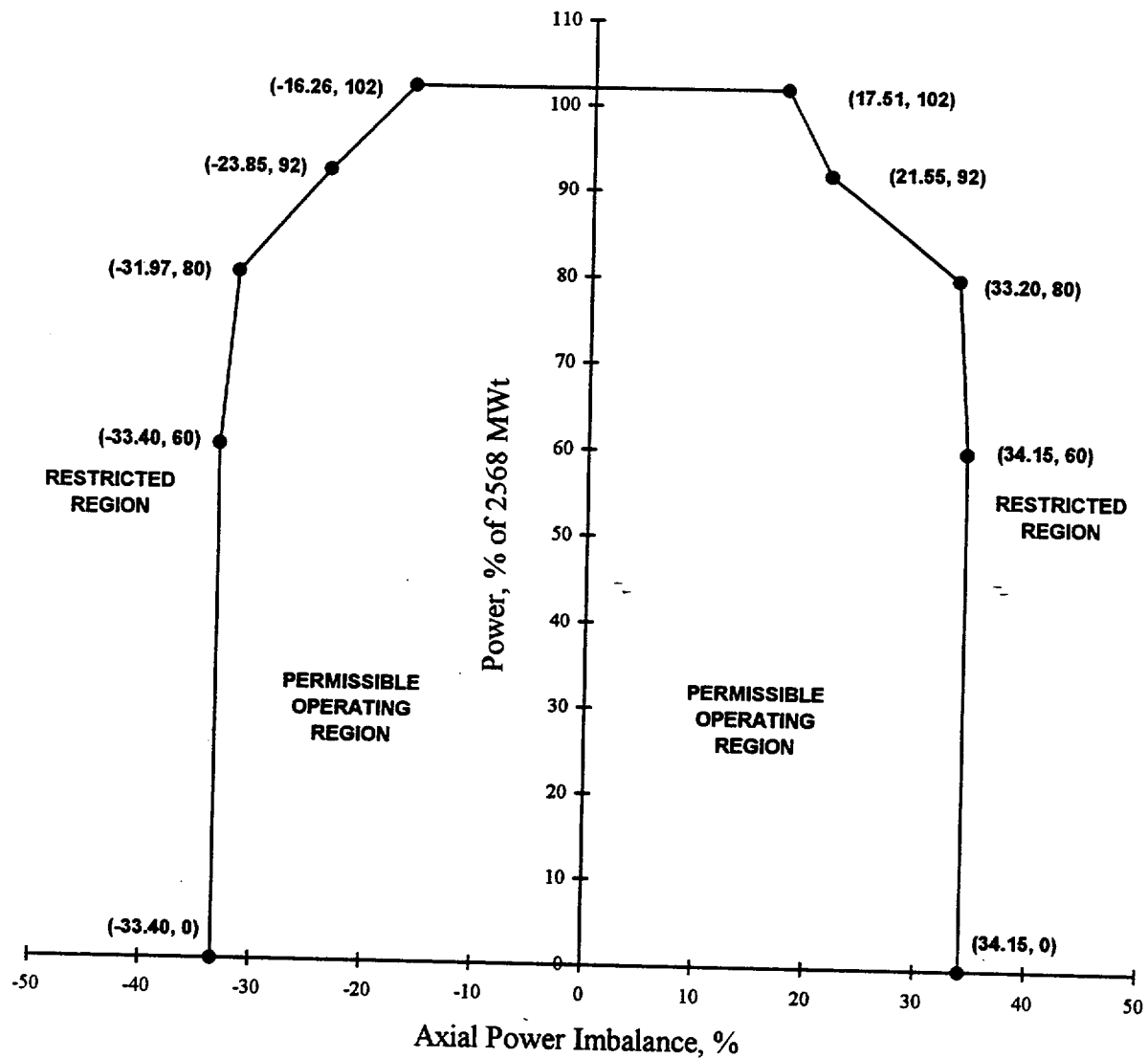


Figure is referred to by
Technical Specification 3.5.2.6

Figure 5 **Operational Power Imbalance Setpoints for Three-Pump
Operation From 0 EFPD to EOC**

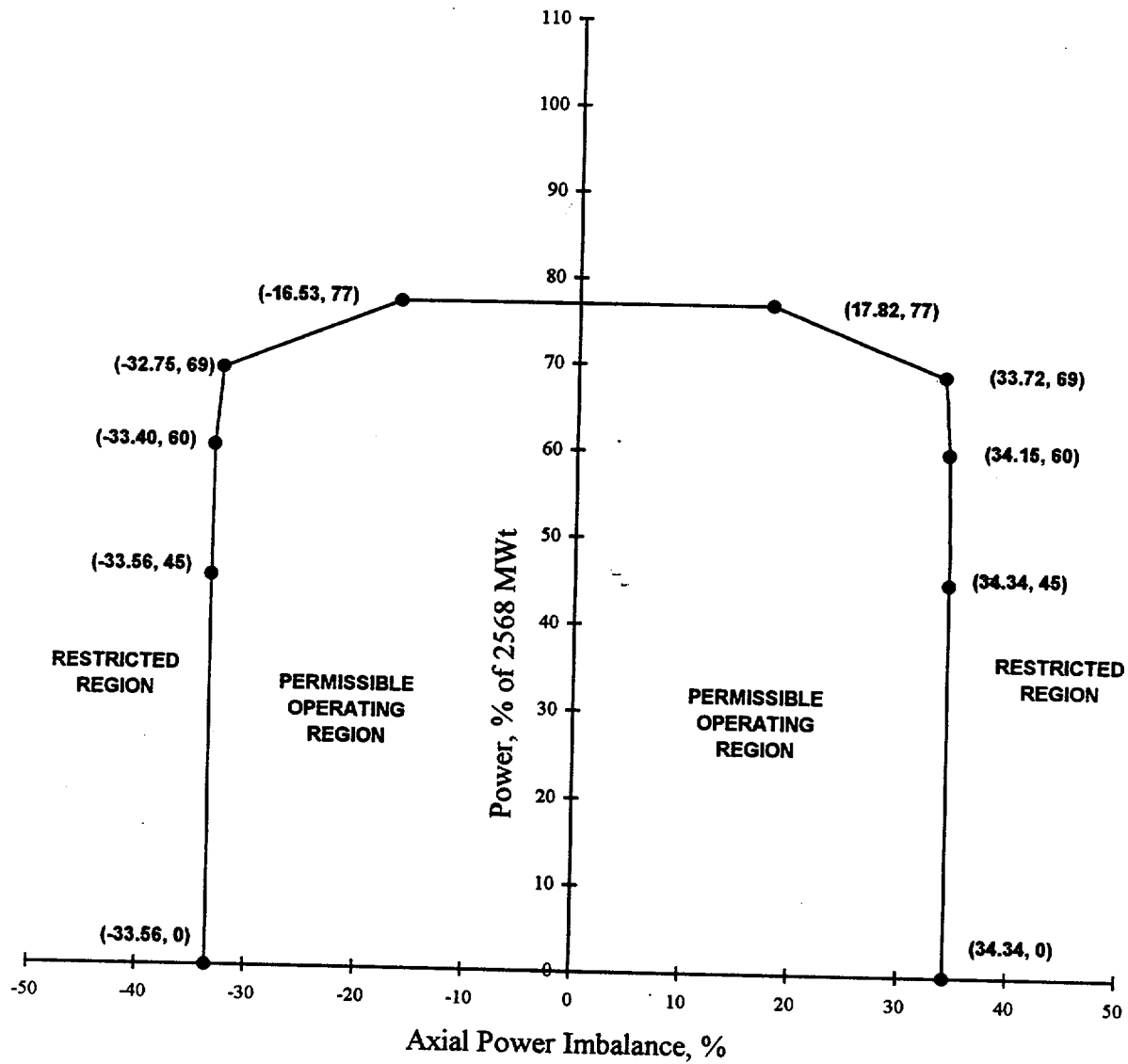


Figure is referred to by
Technical Specification 3.5.2.6

Figure 6 **Operational Power Imbalance Setpoints for Two-Pump
Operation From 0 EFPD to EOC**

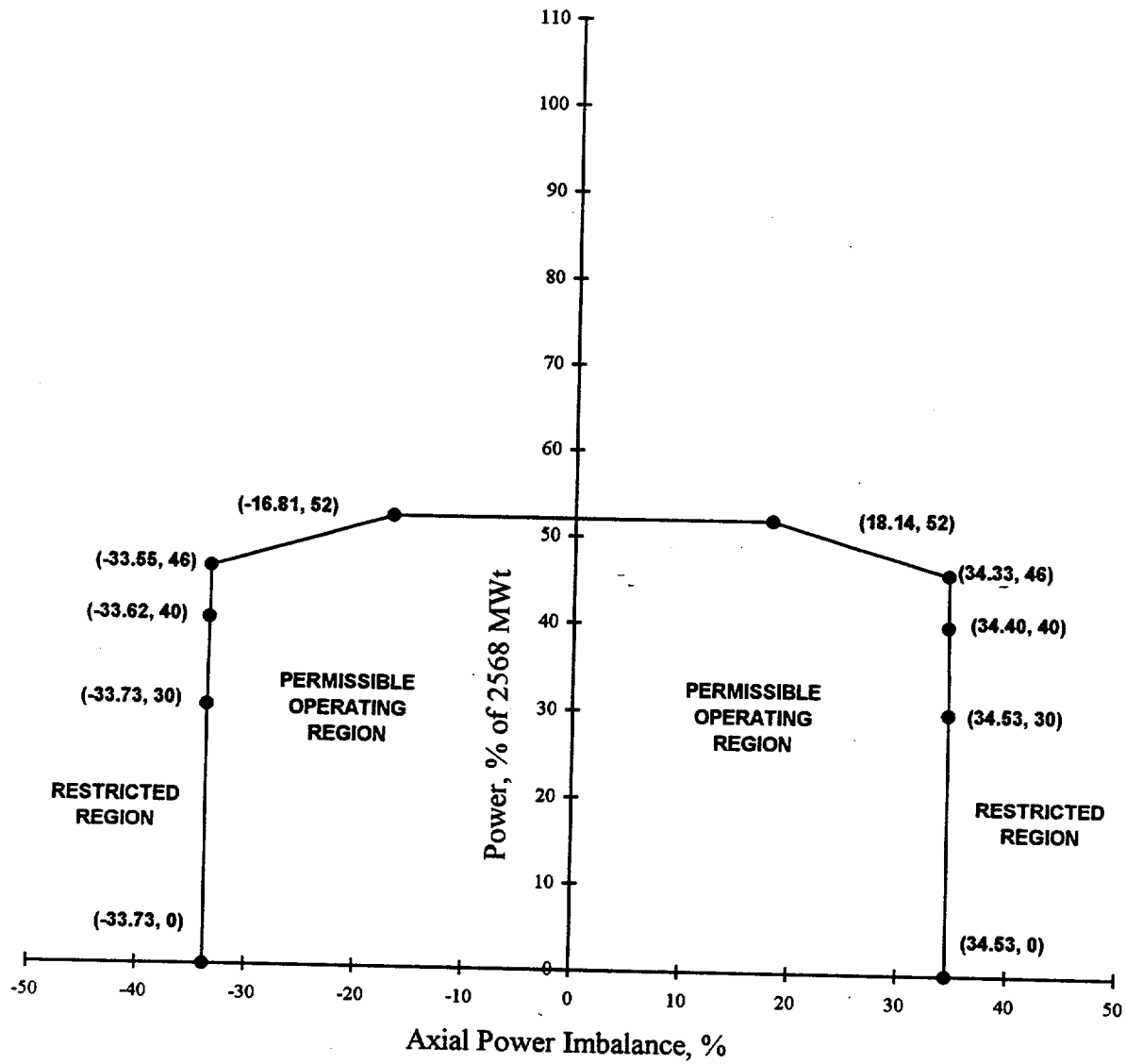


Figure is referred to by
Technical Specification 3.5.2 Bases

Figure 7 Mark-B9ZL LOCA Linear Heat Rate Limits

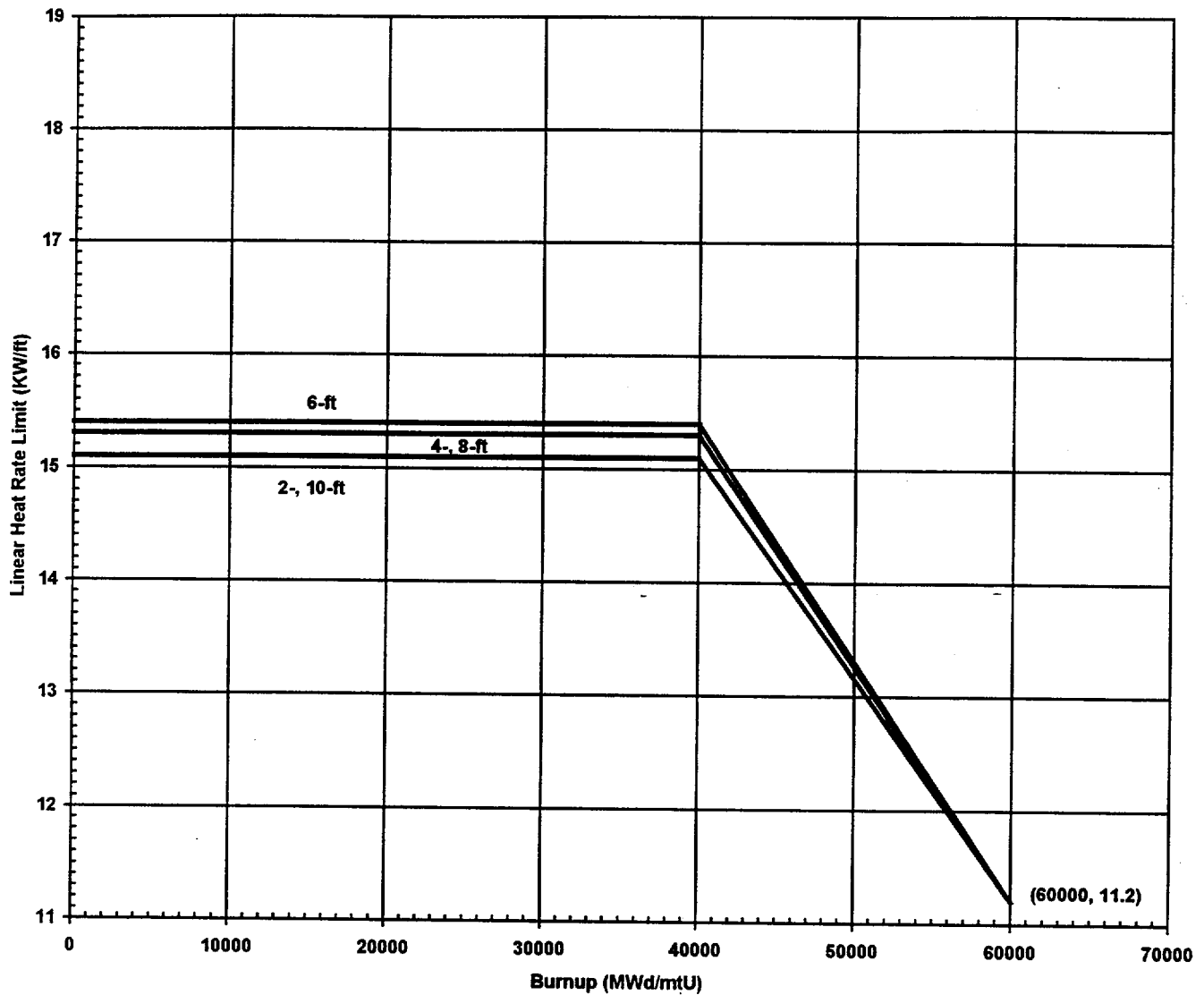


Figure is referred to by
Technical Specification 2.1.2

Figure 8 Axial Power Imbalance Protective Limits

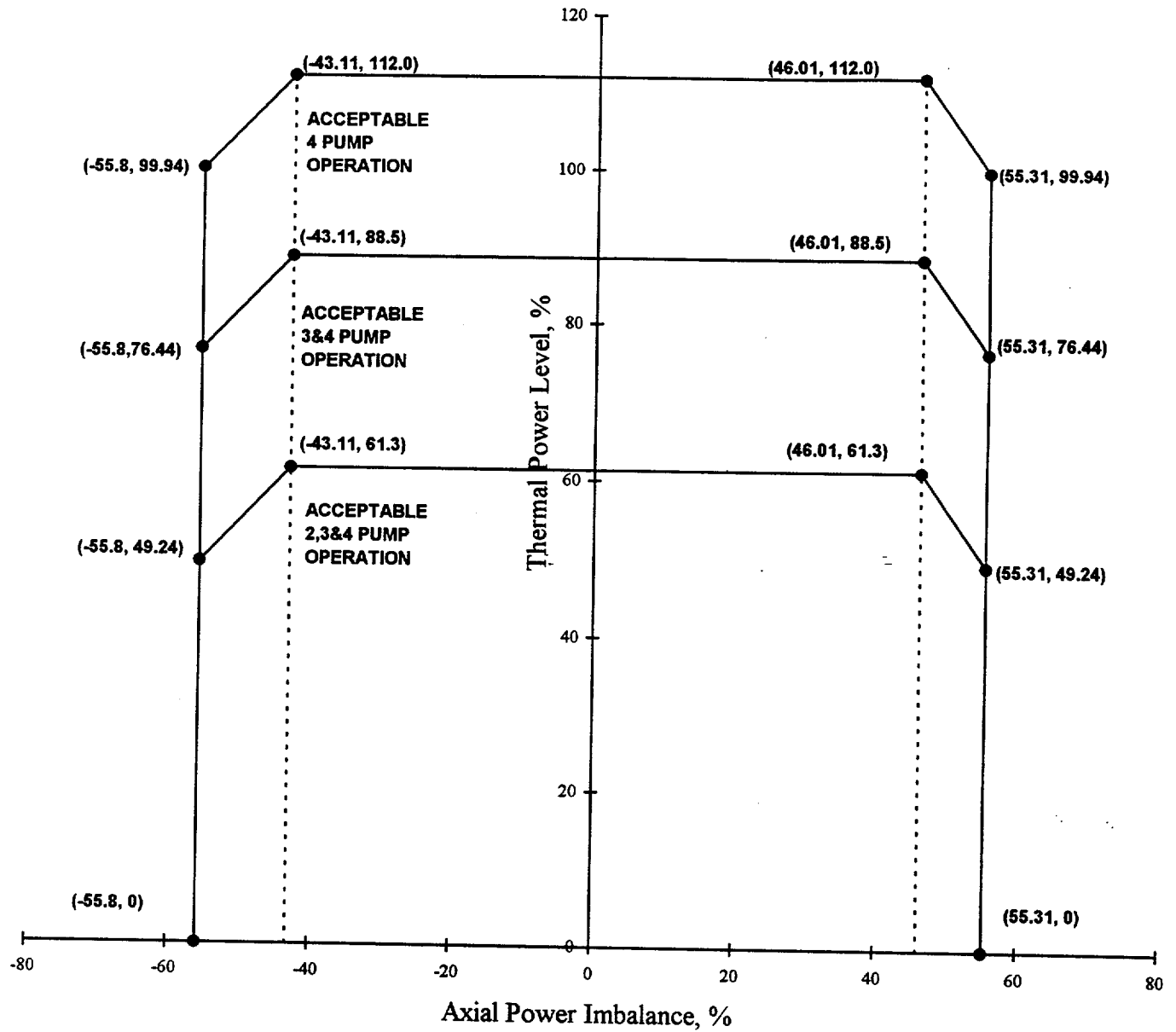


Figure is referred to by
Technical Specification 2.3.1

Figure 9 Protection System Maximum Allowable Setpoints for
Axial Power Imbalance

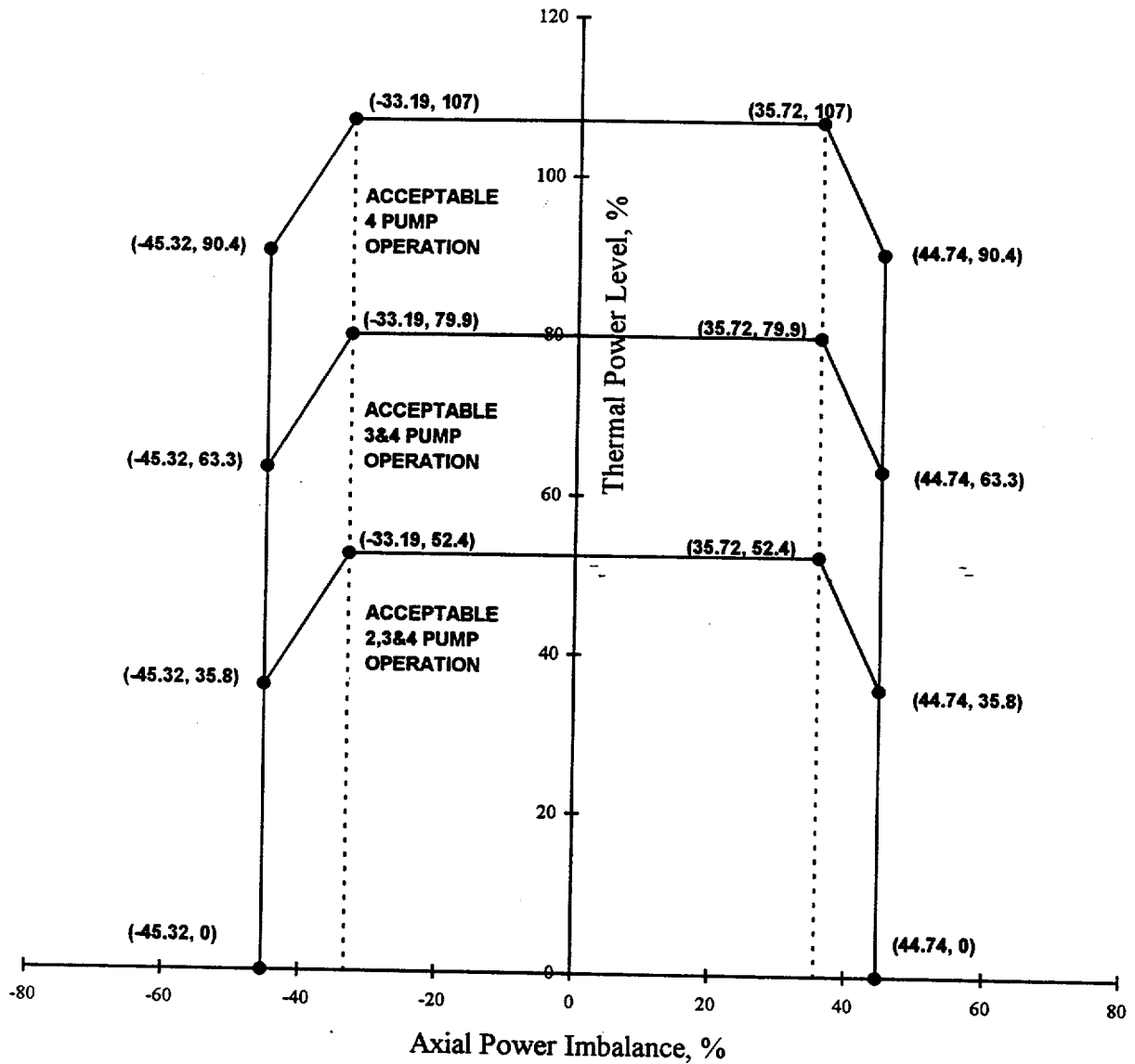
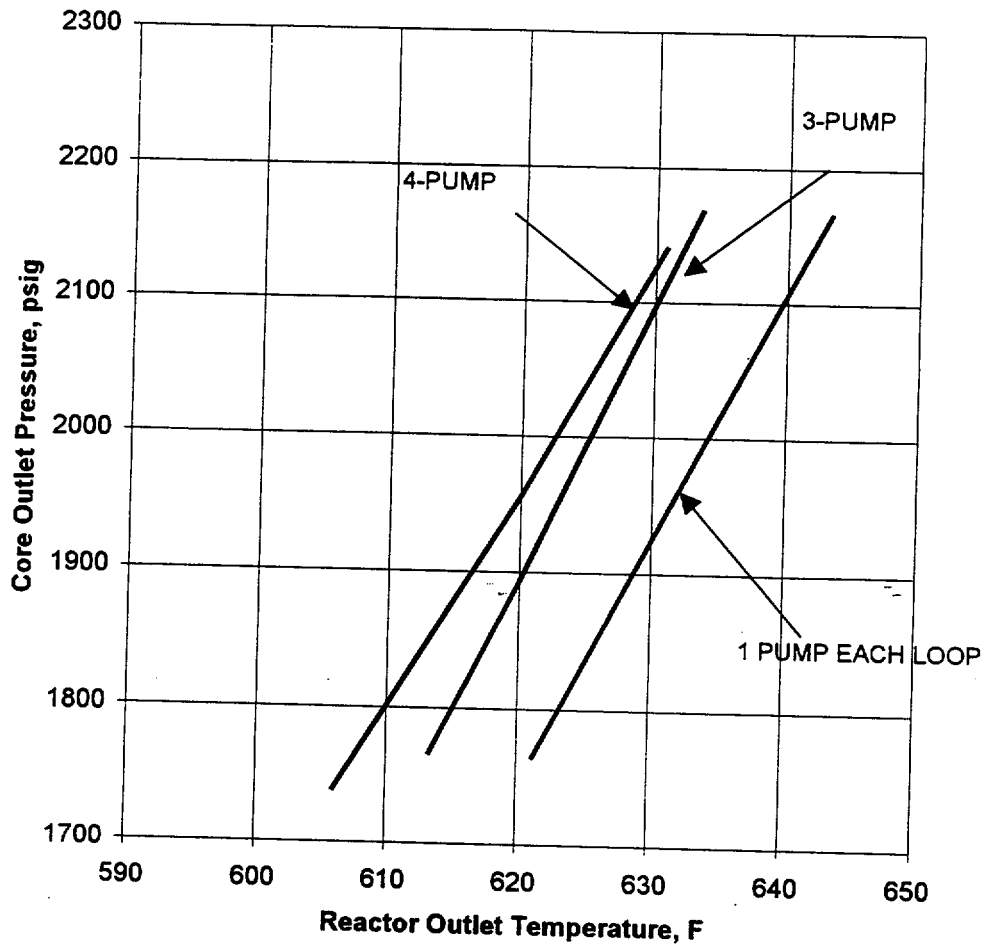


Figure is referred to by
Technical Specification 2.1.3

Figure 10 Variable Low RCS Pressure-Temperature Protective Limits



PUMPS OPERATING (TYPE OF LIMIT)

Four Pumps (DNBR Limit)

Three Pumps (DNBR Limit)

One Pump in Each Loop (DNBR Limit)

GPM*

369,600 (100%)

276,091 (74.7%)

181,104 (49%)

POWER**

110%

89%

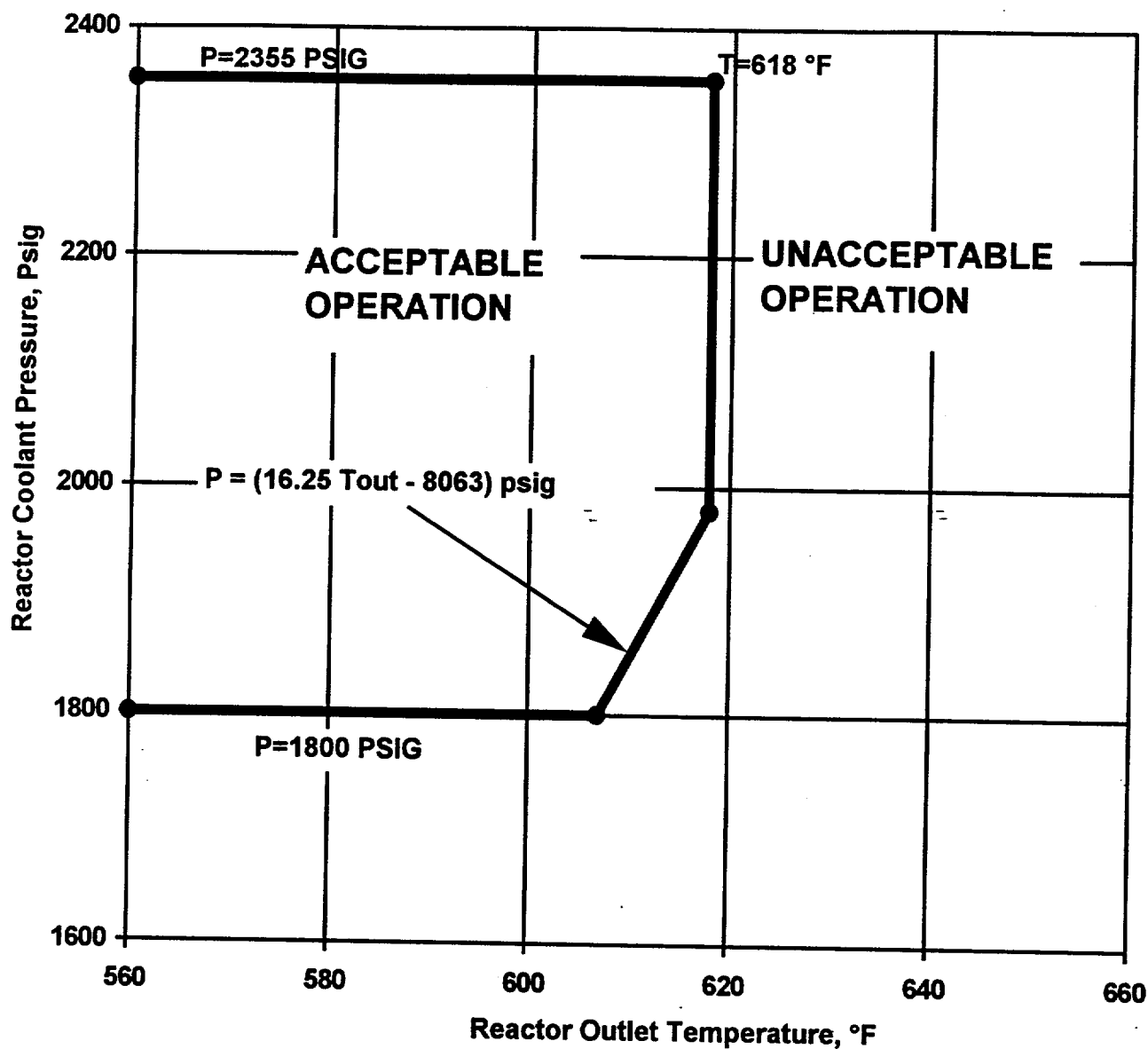
62.2%

* 105% of Design Flow (2.5% UNCERTAINTY INCLUDED IN STATISTICAL DESIGN LIMIT)

**AN ADDITIONAL 2% POWER UNCERTAINTY IS INCLUDED IN STATISTICAL DESIGN LIMIT

Figure is referred to by
Technical Specification Table 2.3-1

Figure 11 RCS Pressure-Temperature Protective Maximum Allowable
Setpoints



**LIMIT IS REFERRED TO BY
TECHNICAL SPECIFICATION 2.1 BASES**

**KW/FT LIMIT FOR AXIAL POWER IMBALANCE PROTECTIVE
LIMITS**

The combination of radial and axial peak that prevents central fuel melting at the hot spot is:

$$\text{KW/FT Limit} = 21.8 \text{ kW/ft}$$

**LIMIT IS REFERRED TO BY
TECHNICAL SPECIFICATION 3.1.8.3 AND 3.5.2.1 AND 3.5.2.2.2 AND
3.5.2.2.3**

MINIMUM SHUTDOWN MARGIN

The minimum available shutdown margin shall be maintained $\geq 1 \text{ \%}\Delta k/k$.

**LIMITS ARE REFERRED TO BY
TECHNICAL SPECIFICATION 3.5.2.5.4**

AXIAL POWER SHAPING ROD INSERTION LIMITS AND SETPOINTS

Up to 480 +10/-10 EFPD, the APSRs may be positioned as necessary for transient imbalance control. However, the APSRs shall be fully withdrawn by 490 EFPD. After the APSR withdrawal at 480 +10/-10 EFPD, the APSRs shall not be reinserted.

**VALUES ARE REFERRED TO BY
TECHNICAL SPECIFICATION 3.5.2.4**

QUADRANT POWER TILT LIMITS AND SETPOINTS

<u>Measurement System</u>	<u>From 0 EFPD to EOC</u>		<u>Maximum Value (%)</u>
	<u>Steady State Value (%)</u>		
	<u><= 60 %FP</u>	<u>> 60 %FP</u>	
Full In-core Detector System Setpoint	6.83	4.44	25.0
Minimum In-core Detector System Setpoint	2.78 ^(*)	1.90 ^(*)	25.0
Ex-core Power Range NI Channel Setpoint	4.05	1.96	25.0
Measurement System - Independent Limit	7.50	4.92	25.0

- ^(*) Assumes that no individual long emitter detector affecting the minimum incore tilt calculation exceeds 73% sensitivity depletion. The setpoint must be reduced to 1.50% (power levels $>60\% \text{FP}$) and to 2.19% (power levels $\leq 60\% \text{FP}$) at the earliest time-in-life that this assumption is no longer valid.

**LIMIT IS REFERRED TO BY
TECHNICAL SPECIFICATION 2.1 BASES**

DESIGN NUCLEAR POWER PEAKING FACTORS

Maximum Radial	$(F^N_{\Delta H})$	1.80
Maximum Axial	(F^N_z)	1.65
Maximum Total	(F^N_q)	2.97