FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

CYCLE 8

CORE OPERATING LIMITS REPORT

REVISION 3

1.0 Core Operating Limits

Core operating limits for CR3 are established and documented in this CORE OPERATING LIMITS REPORT for Cycle 8 for the following:

3.1.1.3.c	Negative Moderator Temperature Coefficient Limit
3.1.3.6	Regulating Rod Insertion Limits
3.1.3.7	Rod Program
3.1.3.9	Axial Power Shaping Rod Insertion Limits
3.2.1	AXIAL POWER IMBALANCE
3.2.4	QUADRANT POWER TILT

The analytical methods used to determine the core operating limits addressed by the individual Technical Specifications shall be those previously reviewed and approved by the NRC, specifically:

1) BAW-10122A Rev. 1, "Normal Operating Controls", May 1984.

2) BAW-10116A, "Assembly Calculations and Fitted Nuclear Data", May 1977

3) BAW-10117P-A, "Babcock & Wilcox Version of PDQ User's Manual", January 1977

4) BAW-10118A, "Core Calculational Techniques and Procedures", December 1979

5) BAW-10124A, "FLAME 3 - A Three-Dimensional Nodal Code for Calculating Core Reactivity and Power Distributions", August 1976

6) BAW-10125A, "Verification of Three-Dimensional FLAME Code", August 1976

7) BAW-10152A "NOODLE - A Multi-Dimensional Two-Group Reactor Simulator", June 1985

8) BAW-10119, "Power Peaking Nuclear Reliability Factors", June 1977

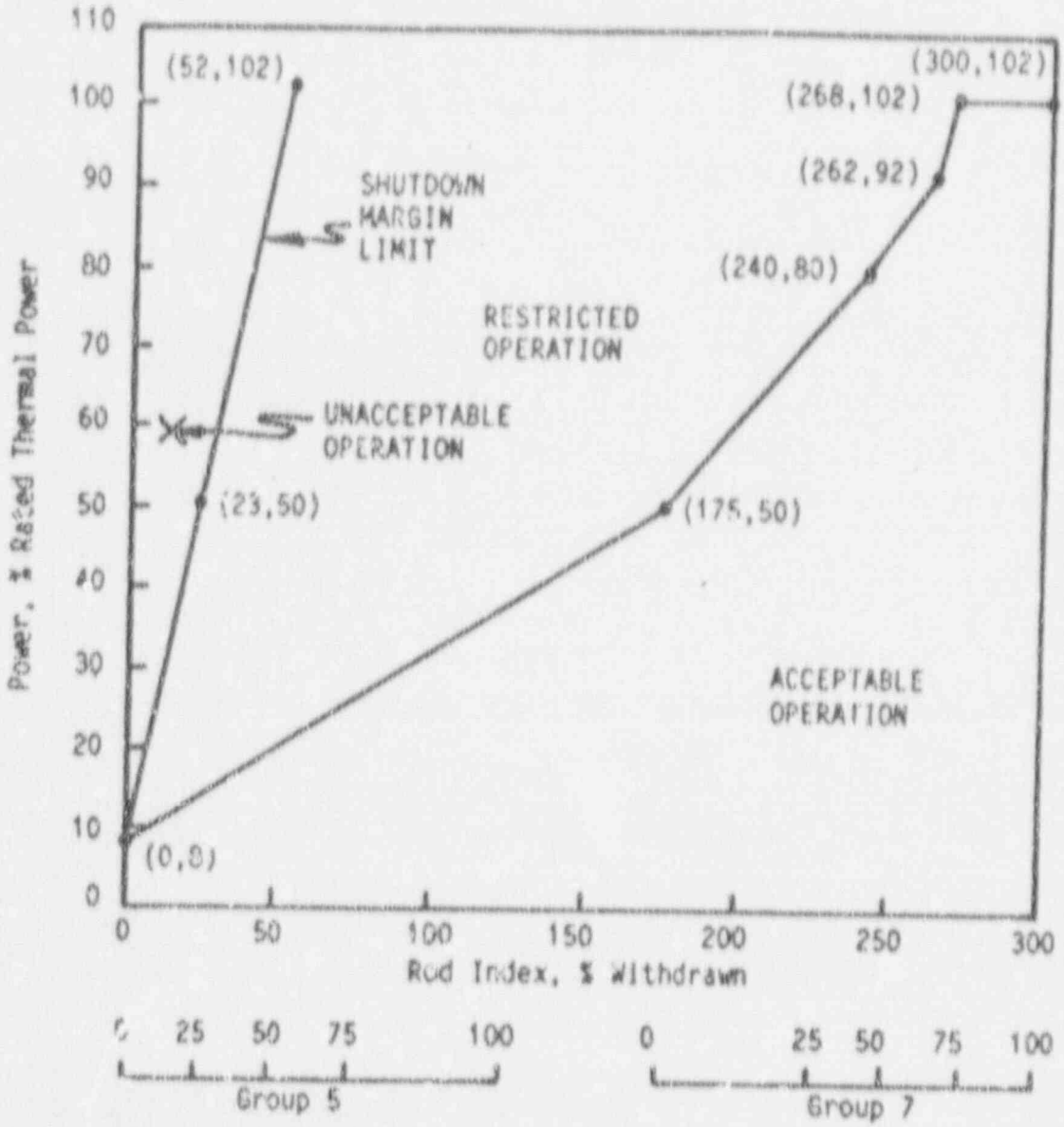
9) The methodology for Rod Program received NRC approval in the Safety Evaluation Report dated January 31, 1990.

The core operating limits shall be determined so that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

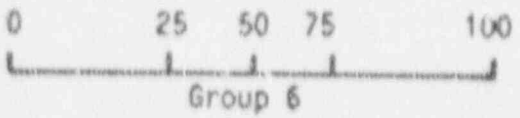
The CORE OPERATING LIMITS REPORT, including any mid-cycle revision or supplements thereto, shall be provided upon issuance for each reload cycle to the NRC Document Control Desk with copies to the Regional Administrator and the Resident Inspector.

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Four-Pump Operation from
0 to 30 +10/-0 EFPD



This figure is referred to by Technical Specification 3.1.3.6

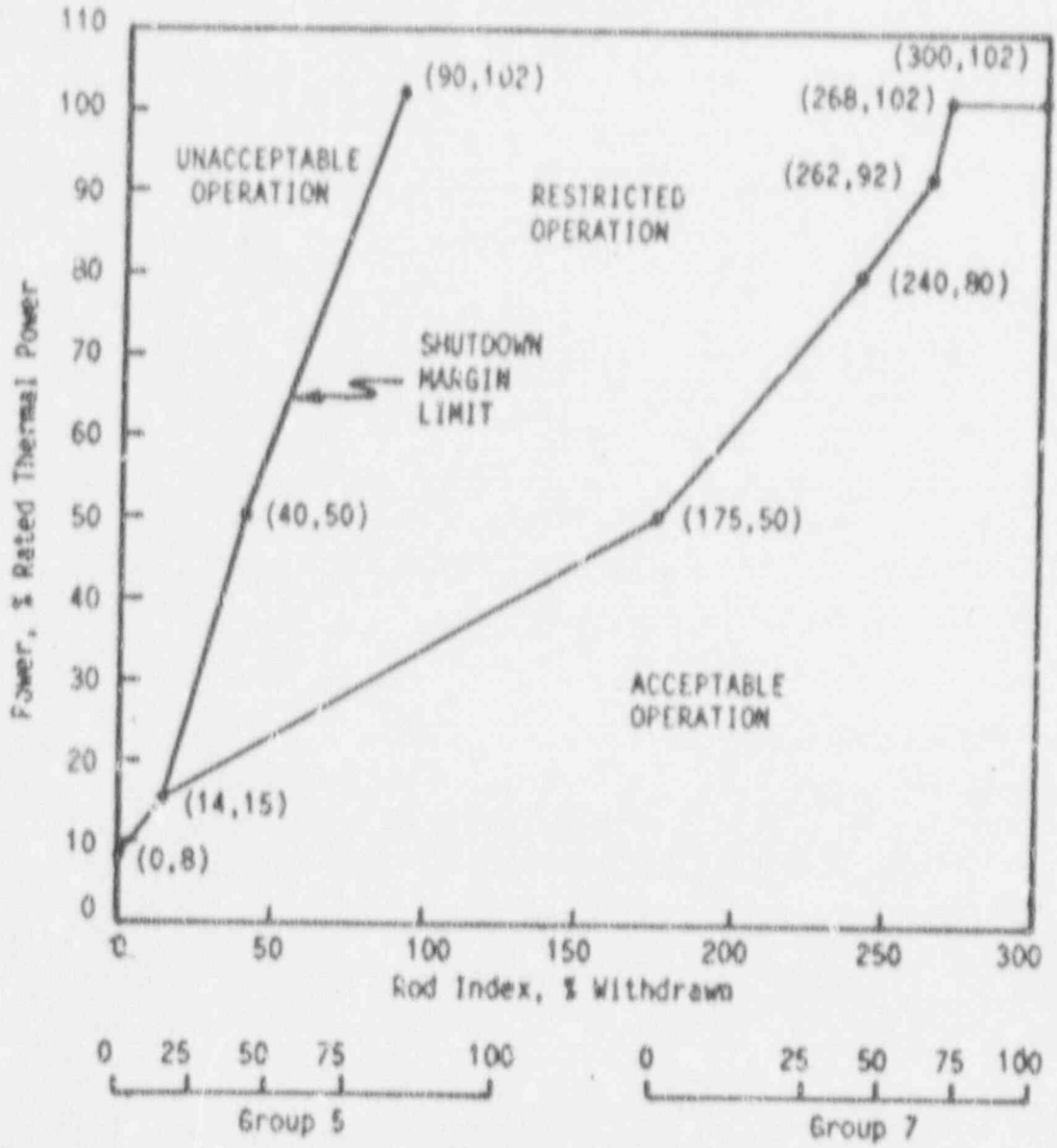


Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

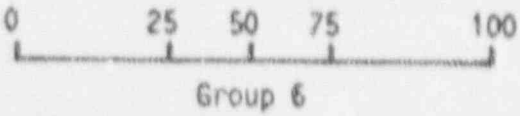
Figure 1

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Four-Pump Operation from
50 +10/-0 to 100 +10/-0 EFPD



This figure referred to by Technical Specification 3.1.3.6

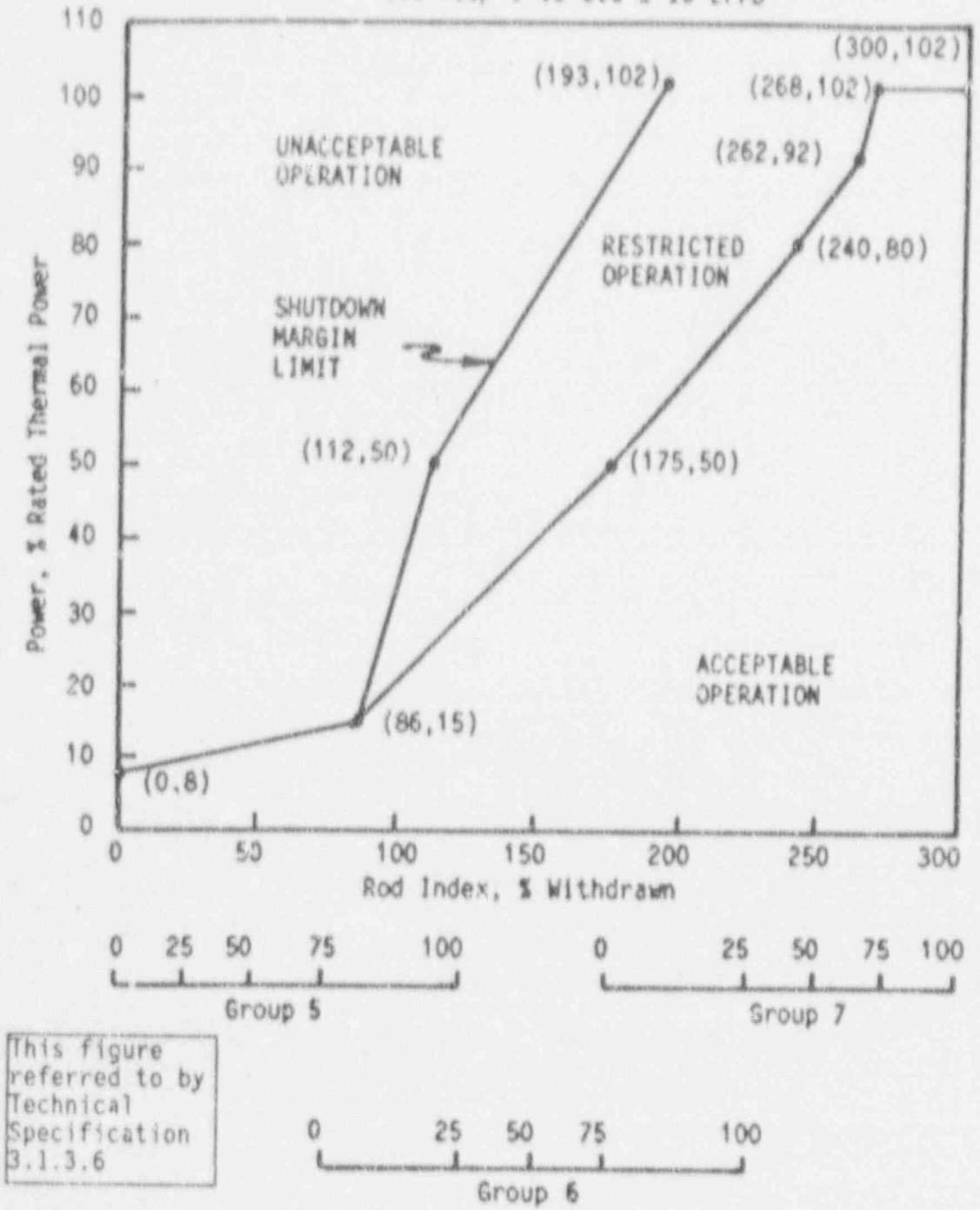


Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

Figure 2

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Four-Pump Operation from
100 +10/-0 to 525 ± 10 EFPD



This figure referred to by Technical Specification 3.1.3.6

Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

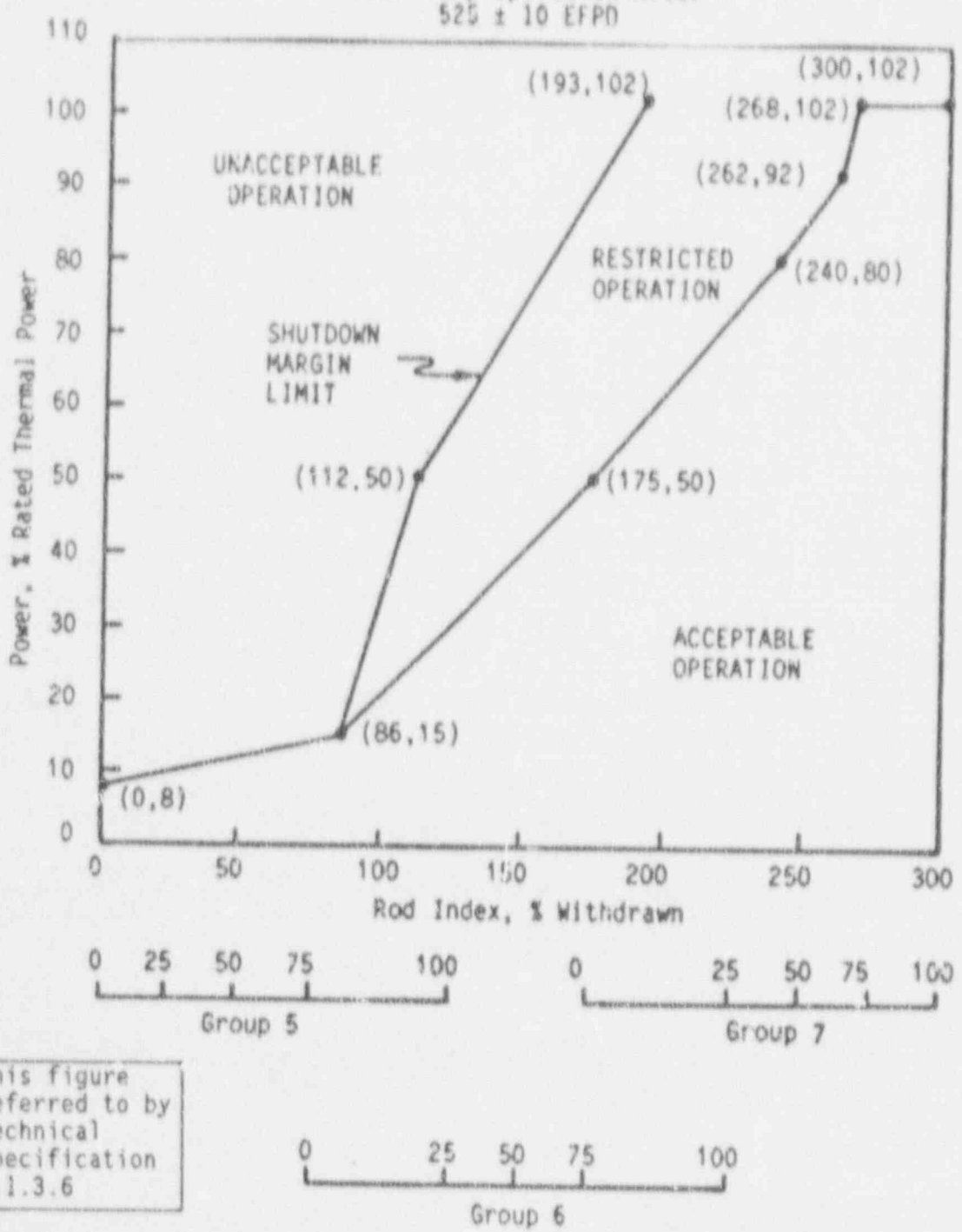
Note 2: This Figure shall be used up to complete APSR withdrawal per Technical Specification 3.1.3.9.

Figure 3

Rev. 3

Crystal River 3, Cycle 6

Regulating Rod Group Insertion Limits for
Four-Pump Operation After
525 ± 10 EFPD



This figure referred to by Technical Specification 3.1.3.6

Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

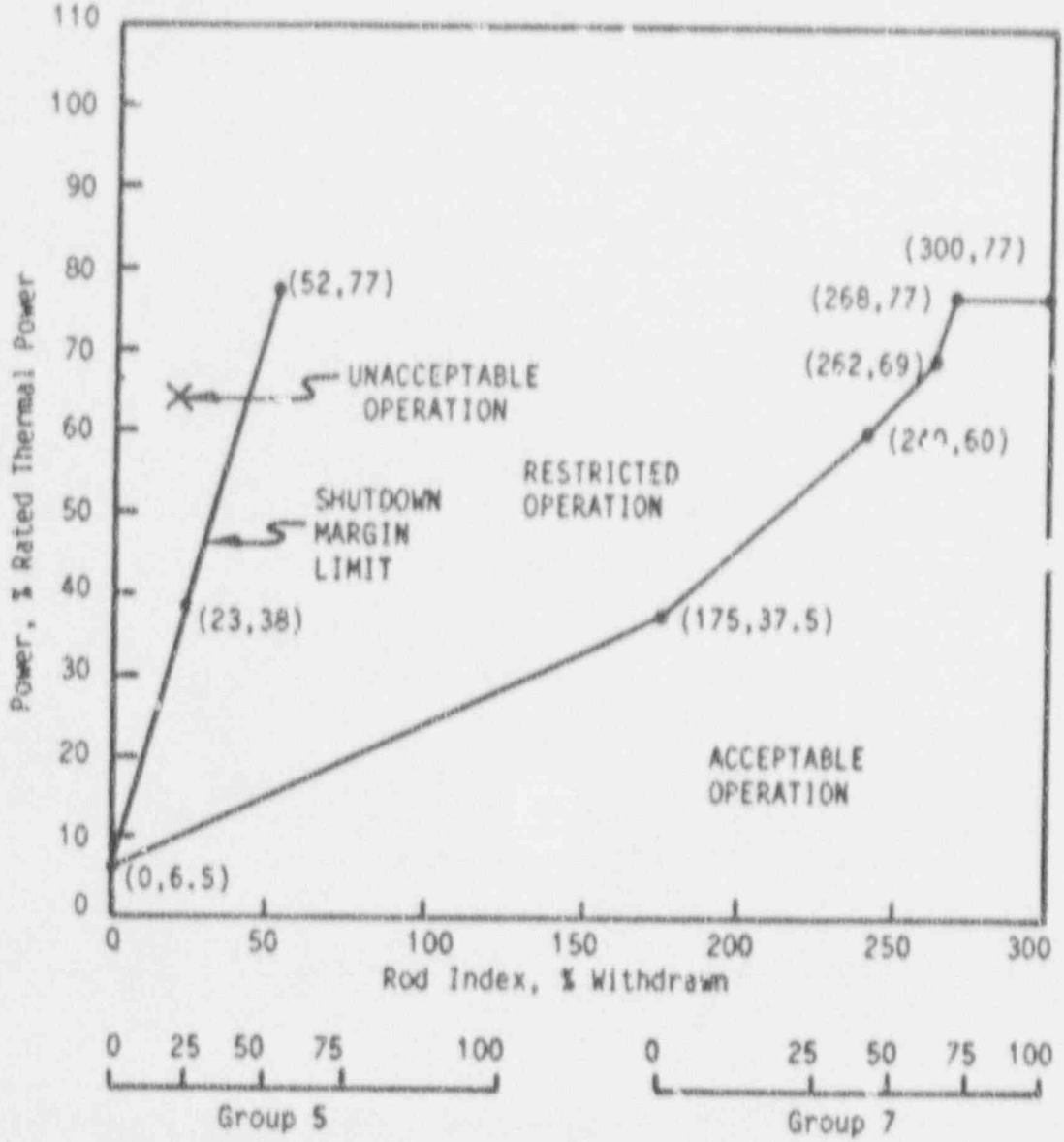
Note 2: This Figure shall be used after complete APSR withdrawal per Technical Specification 3.1.3.9.

Figure 4

Rev. 3

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Three-Pump Operation from
0 to 30 +10/-0 EFPD



This figure referred to by Technical Specification 3.1.3.6

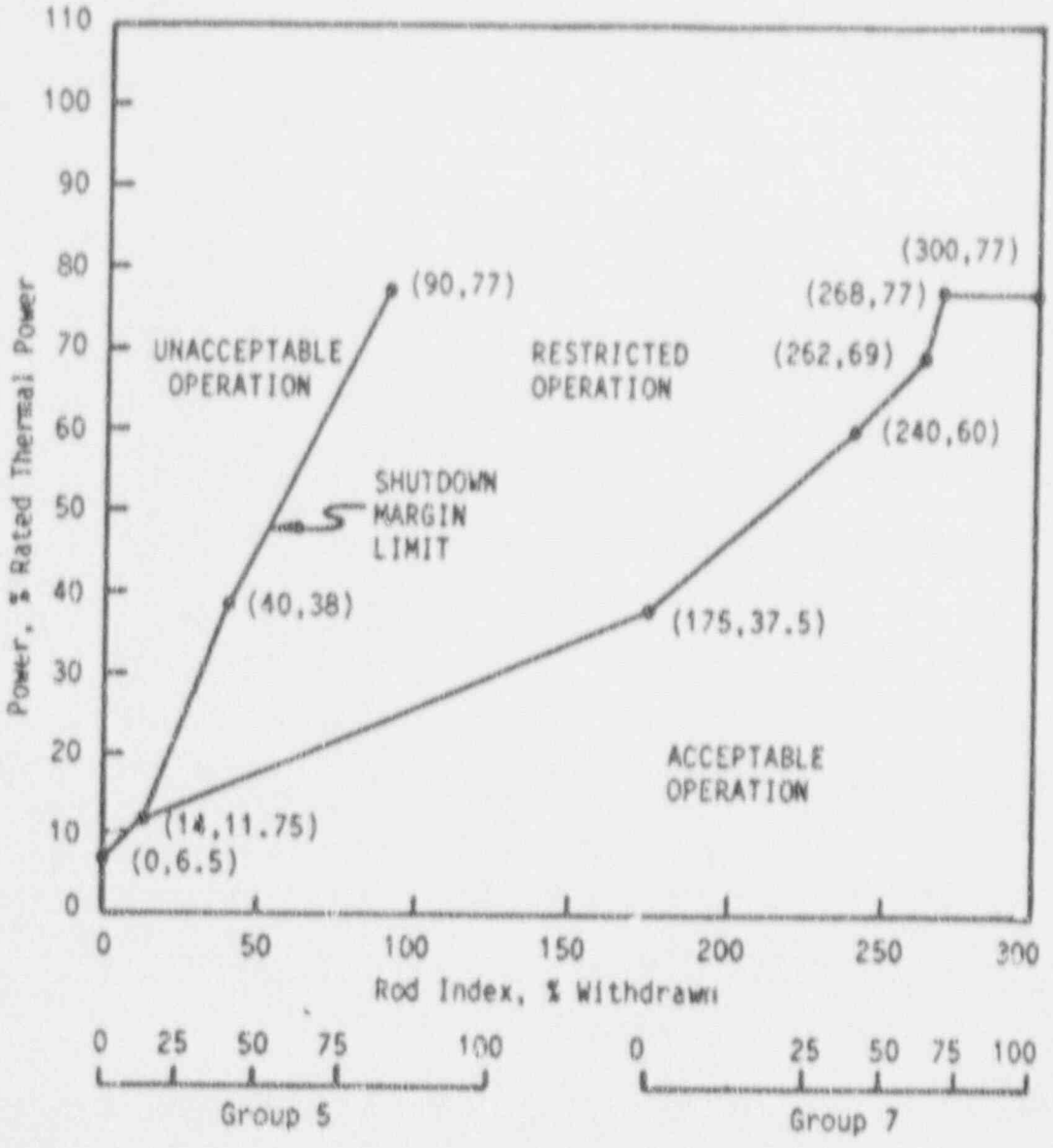
Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

Figure 5

Rev. 3

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Three-Pump Operation from
30 +10/-0 to 100 +10/-0 EFPD



This figure referred to by Technical Specification 3.1.3.6

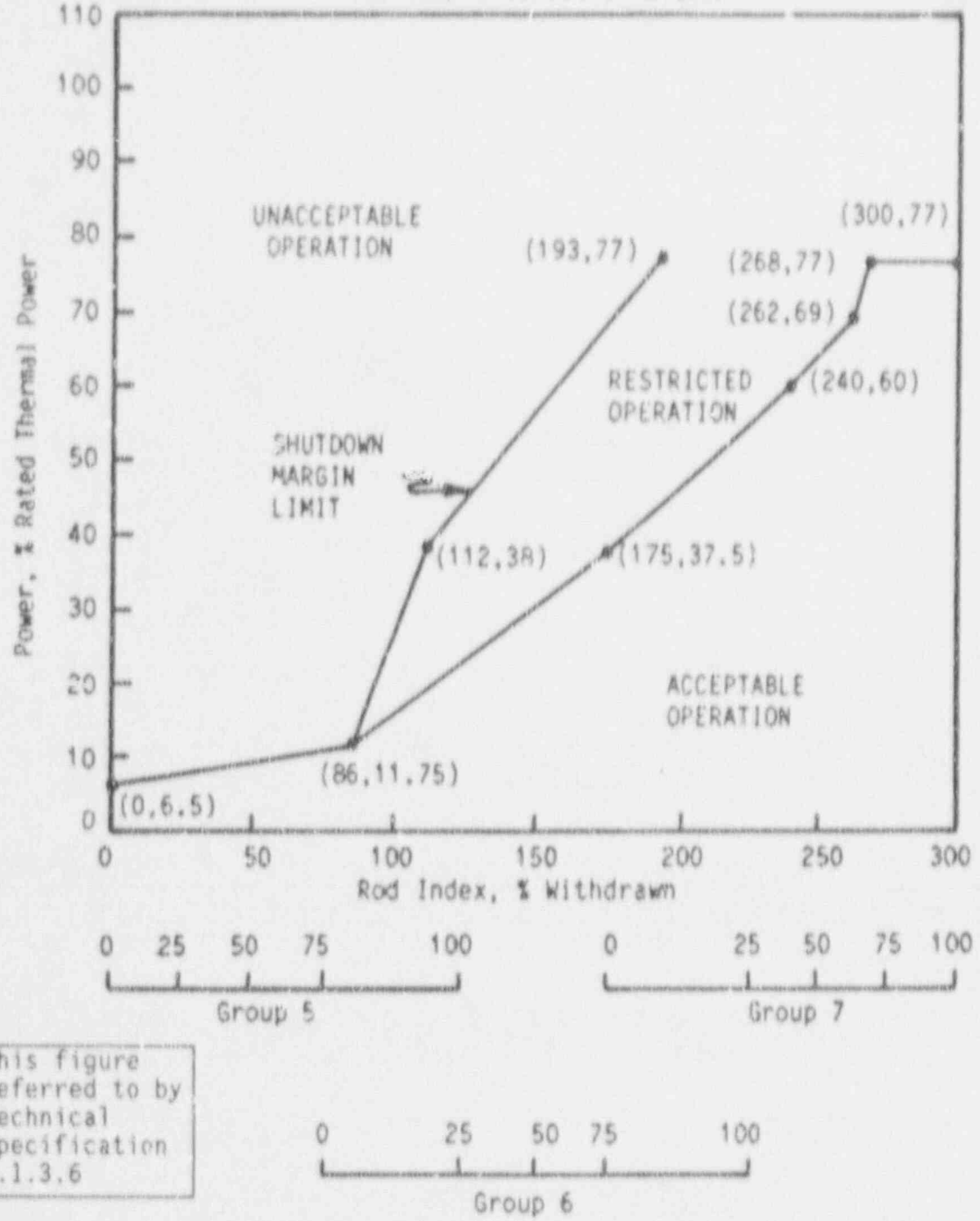
Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

Figure 6

Rev. 3

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Three-Pump Operation from
100 +10/-0 to 525 ± 10 EFPD



This figure referred to by Technical Specification 3.1.3.6

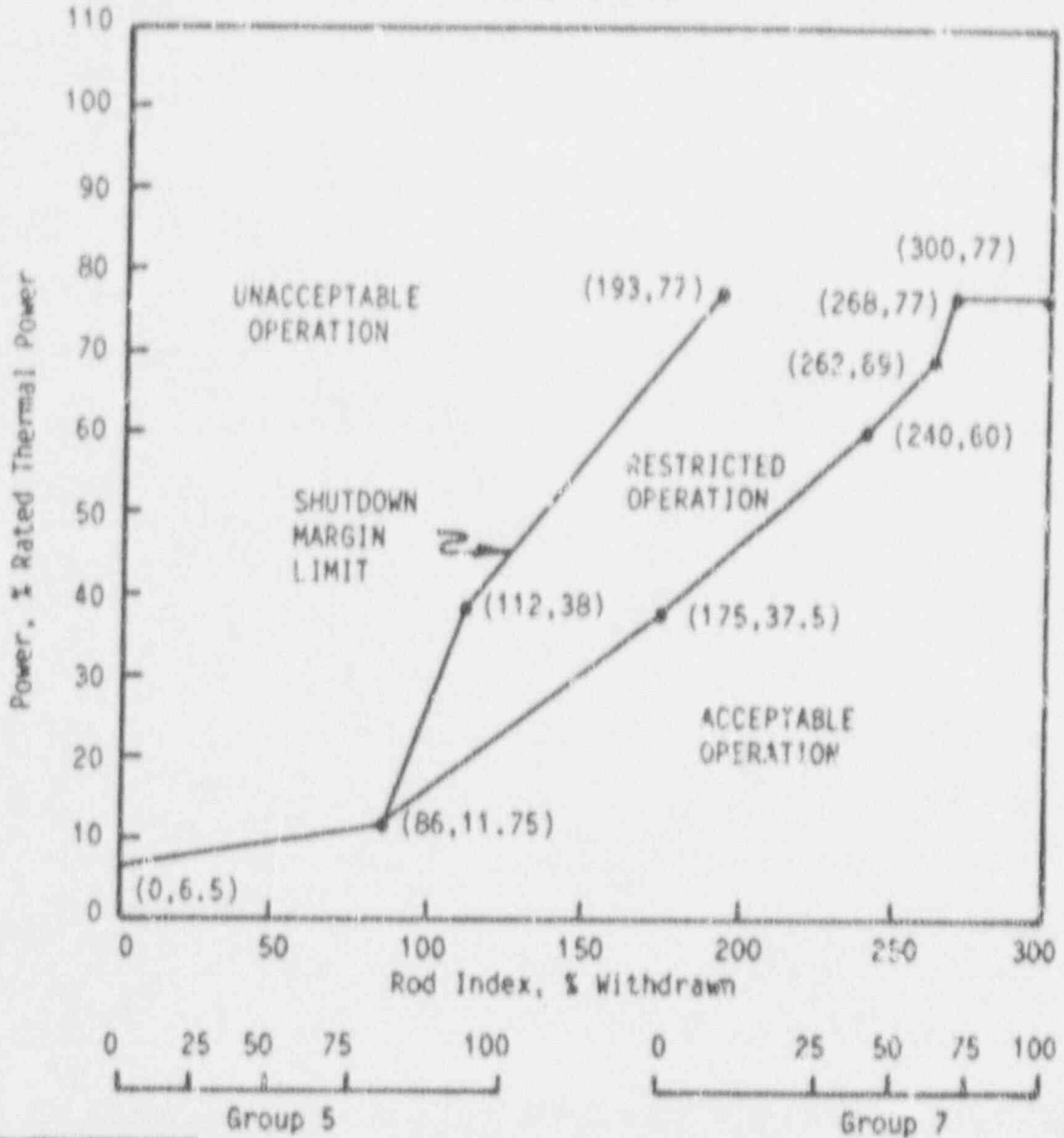
Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

Note 2: This Figure shall be used up to complete APSR withdrawal per Technical Specification 3.1.3.9.

Figure 7

Crystal River 3, Cycle 8

Regulating Rod Group Insertion Limits for
Three-Pump Operation After
525 ± 10 EFPD



This figure referred to by Technical Specification 3.1.3.6

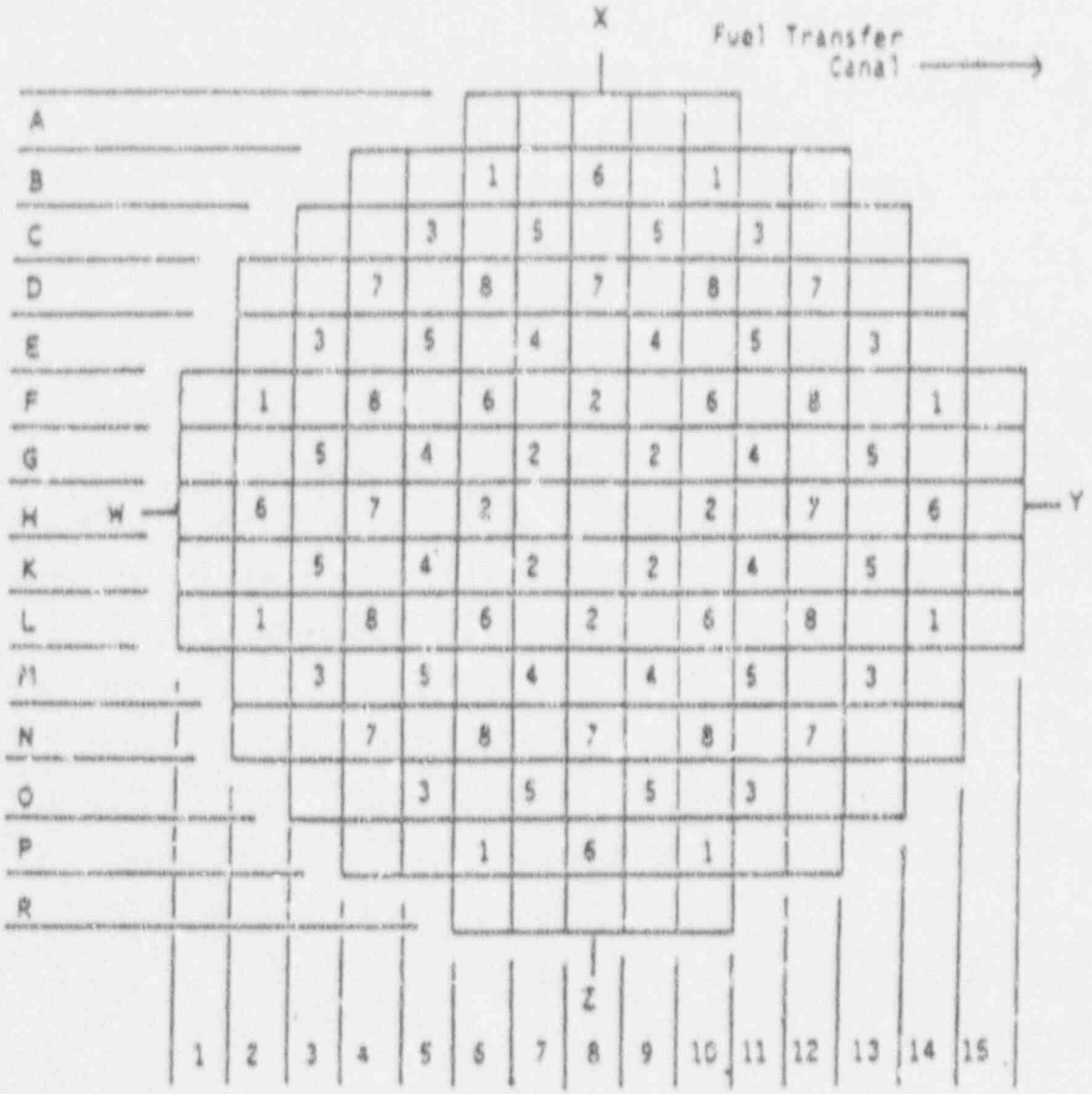
Note 1: A rod group overlap of 25 ± 5% between sequential withdrawn groups 5 and 6, and 6 and 7 shall be maintained.

Note 2: This Figure shall be used after complete APSR withdrawal per Technical Specification 3.1.3.9.

Figure 8

Rev. 3

Crystal River 3, Cycle 8
Control Rod Locations and Group Designations



[X] Group Number

This figure referred to by Technical Specification 3.1.3.7

Group	No. of Rods	Function
1	8	Safety
2	8	Safety
3	8	Safety
4	8	Safety
5	12	Control
6	8	Control
7	8	Control
8	8	APSRs
	Total 68	

Figure 9

Crystal River 3, Cycle 8

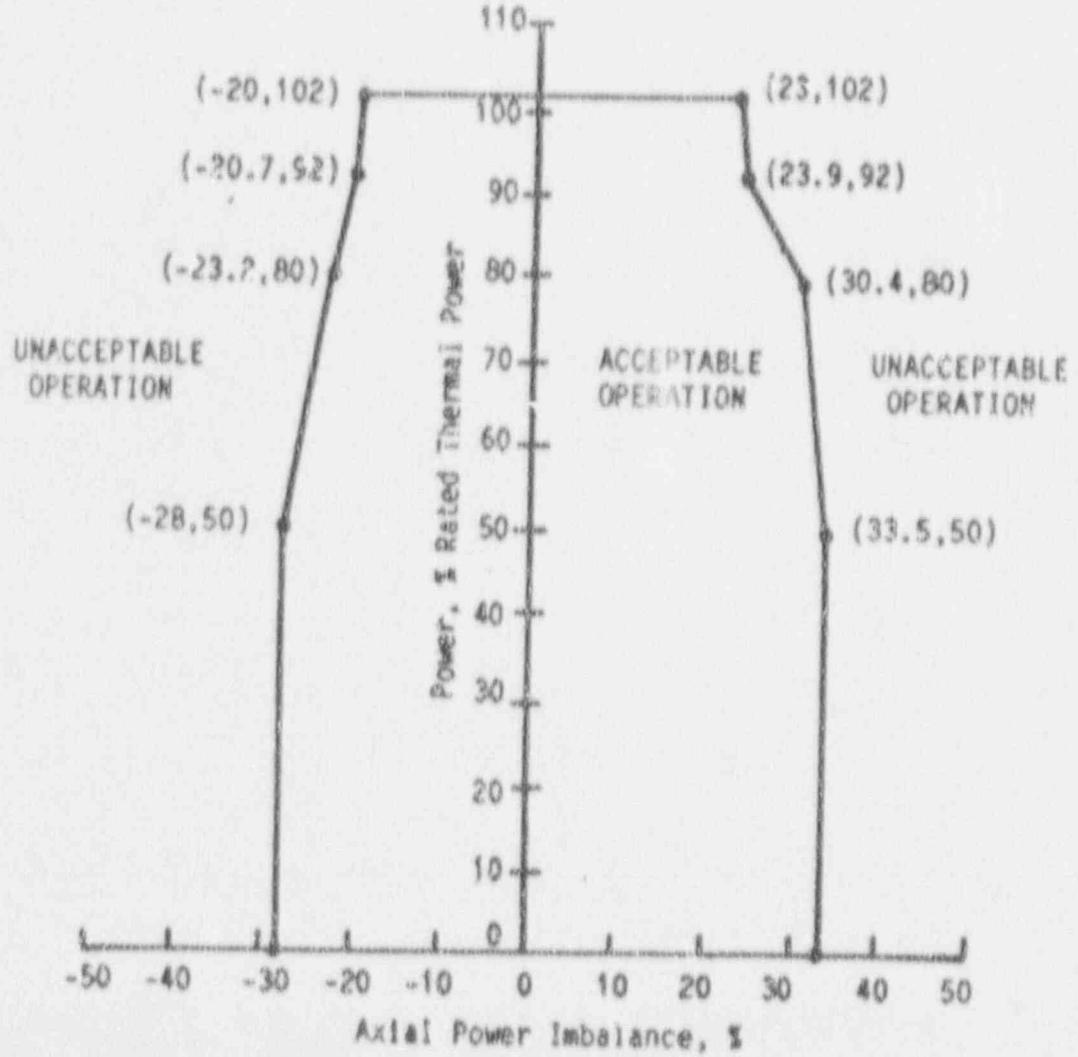
AXIAL POWER SHAPING ROD INSERTION LIMITS

Up to 515 EFPD, the APSR's may be positioned as necessary. The APSR's shall be completely withdrawn (100%) by 535 EFPD. Between 515 and 535 EFPD, the APSR's may be withdrawn. However, once withdrawn during this period, the APSR's shall not be reinserted.

These limits are referred to by Technical Specification 3.1.3.9

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Four-Pump Operation From
0 to 30 +10/-0 EFPD

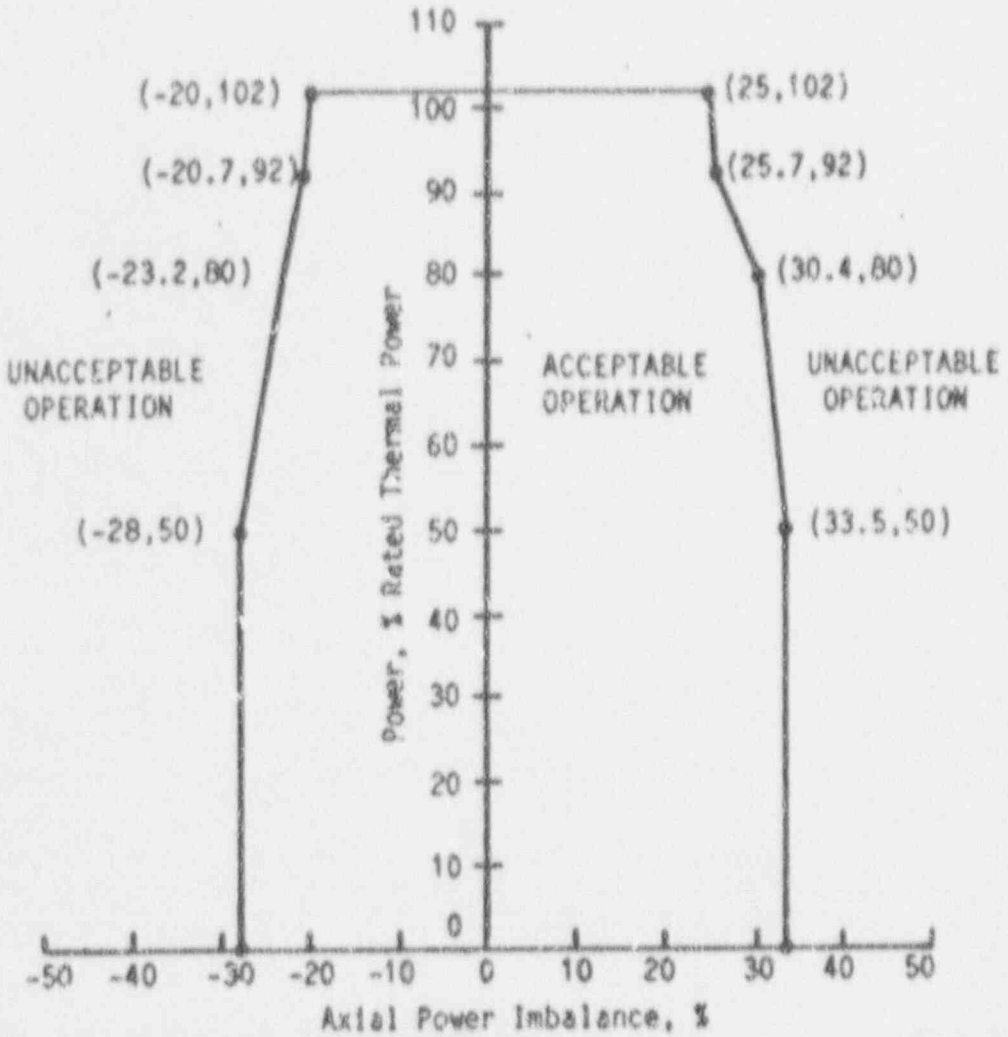


This figure referred to by Technical Specification 3.2.1

Figure 10

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Four-Pump Operation From
30 +10/-0 to 100 +10/-0 EFPD

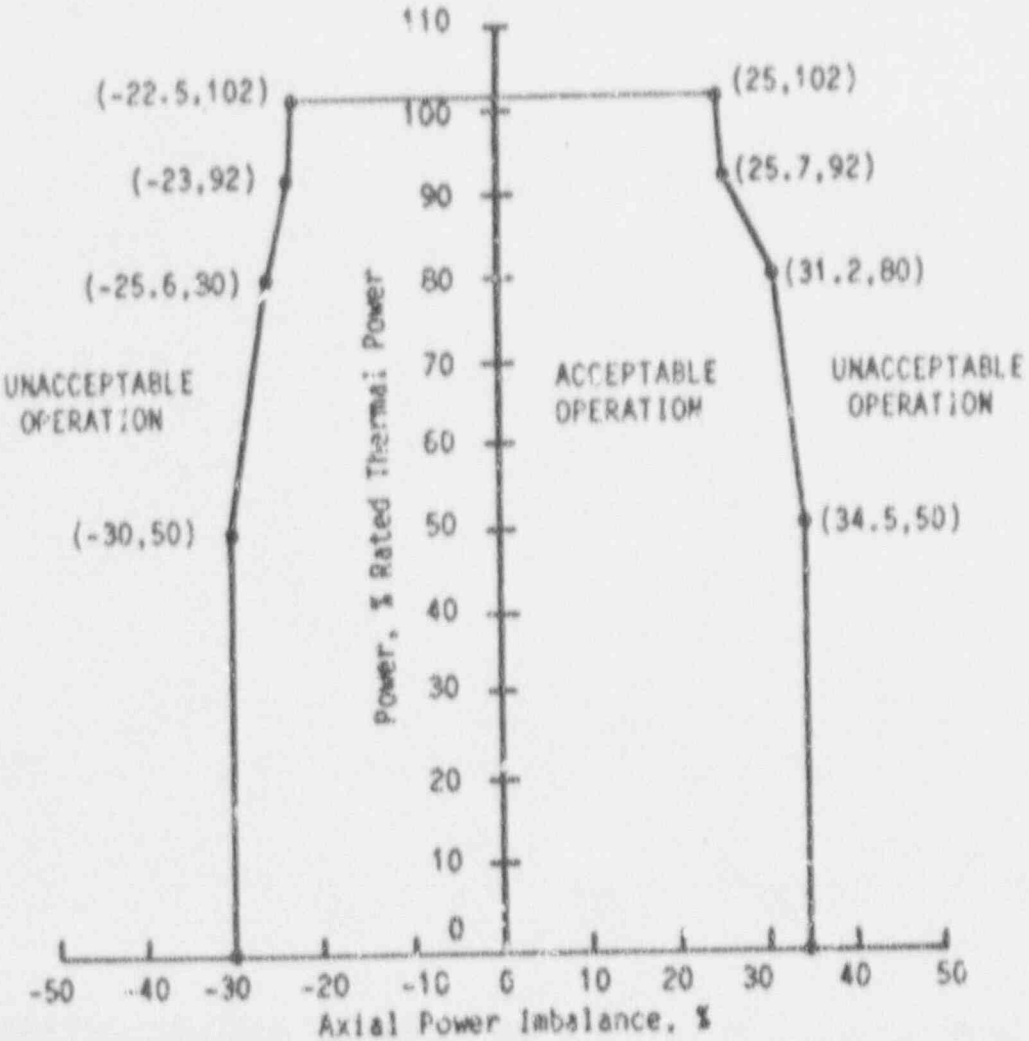


This figure referred to by Technical Specification 3.2.1

Figure 11

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Four-Pump Operation From
100 +10/-0 to 525 ± 10 EFPD



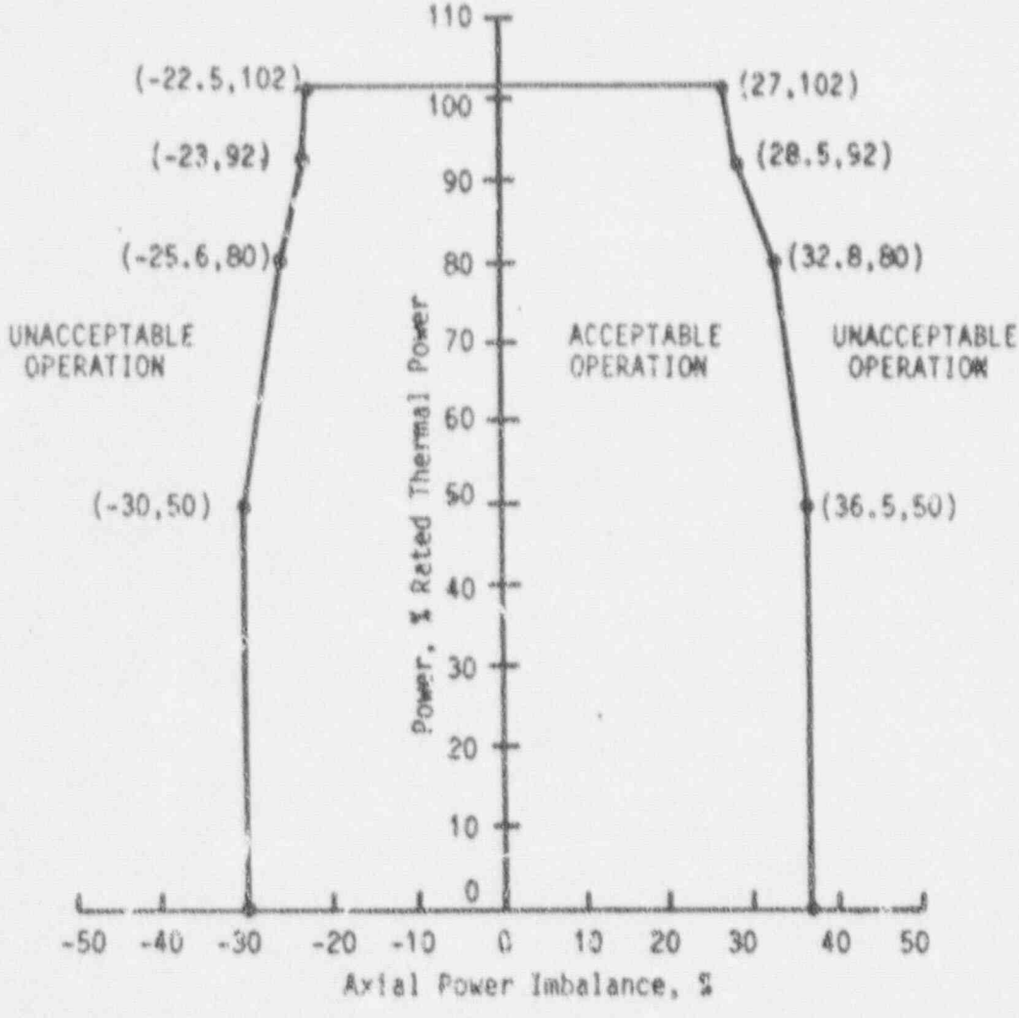
This figure referred to by Technical Specification 3.2.1

Figure 12

Rev. 3

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Four-Pump Operation After
525 ± 10 EFPD

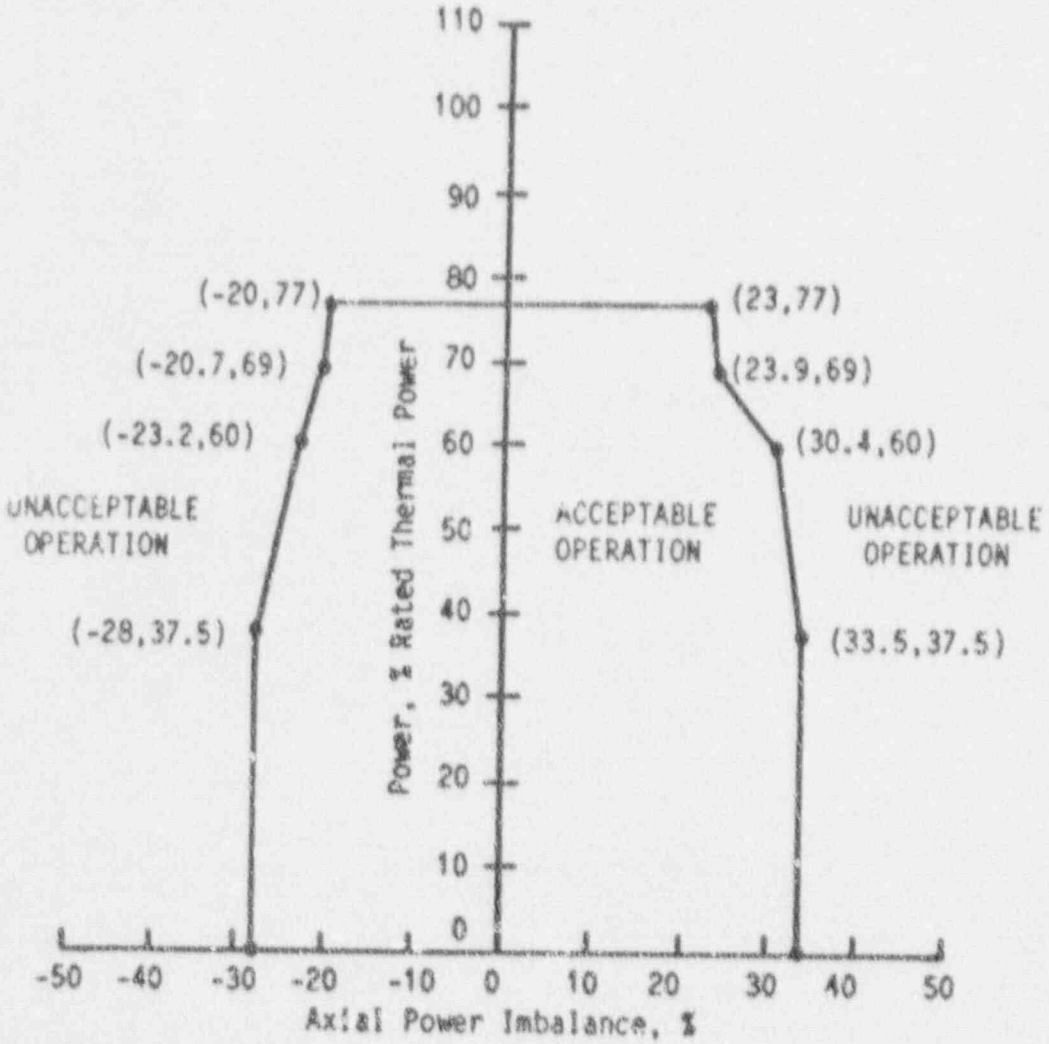


This figure referred to by Technical Specification 3.2.1

Figure 13

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Three-Pump Operation From
0 to 30 +10/-0 EFPD

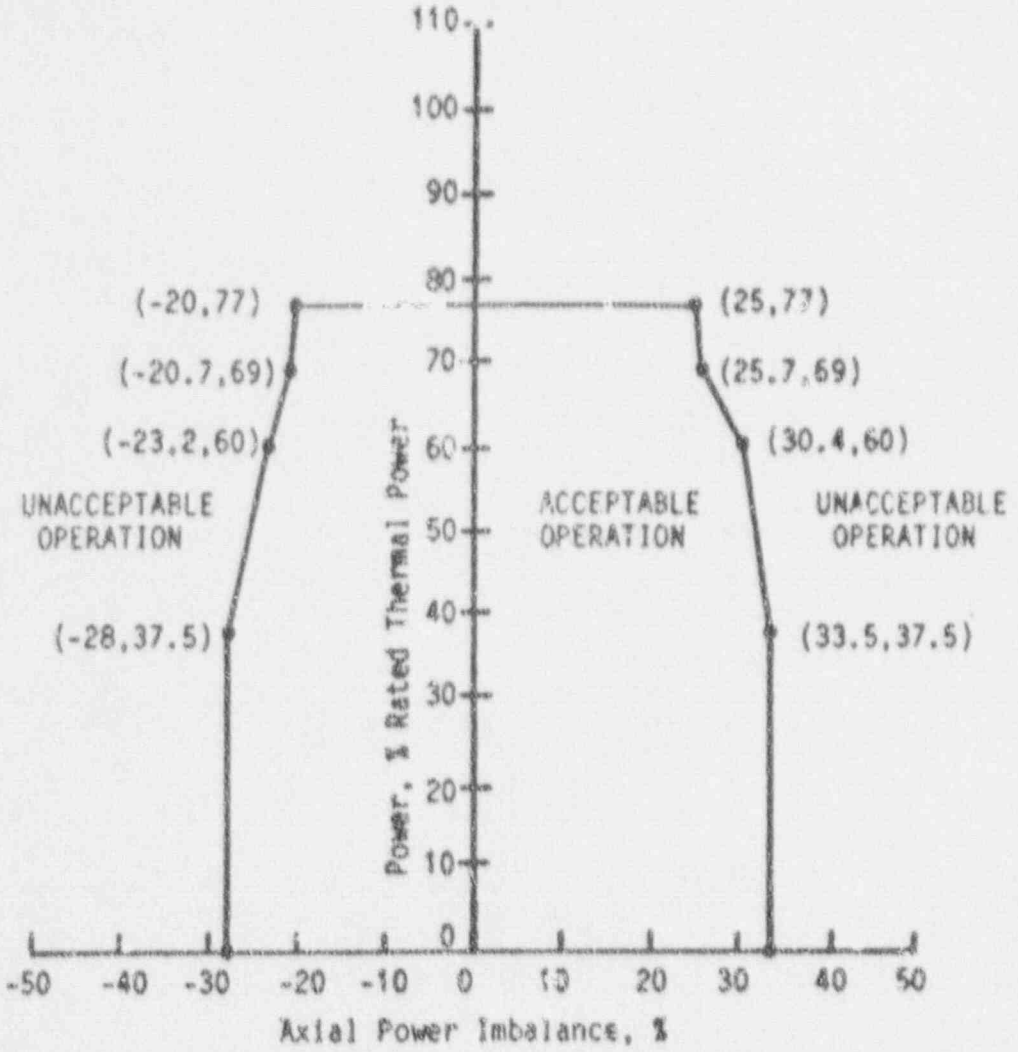


This figure referred to by Technical Specification 3.2.1

Figure 14

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Three-Pump Operation From
30 +10/-0 to 100 +10/-0 EFPD



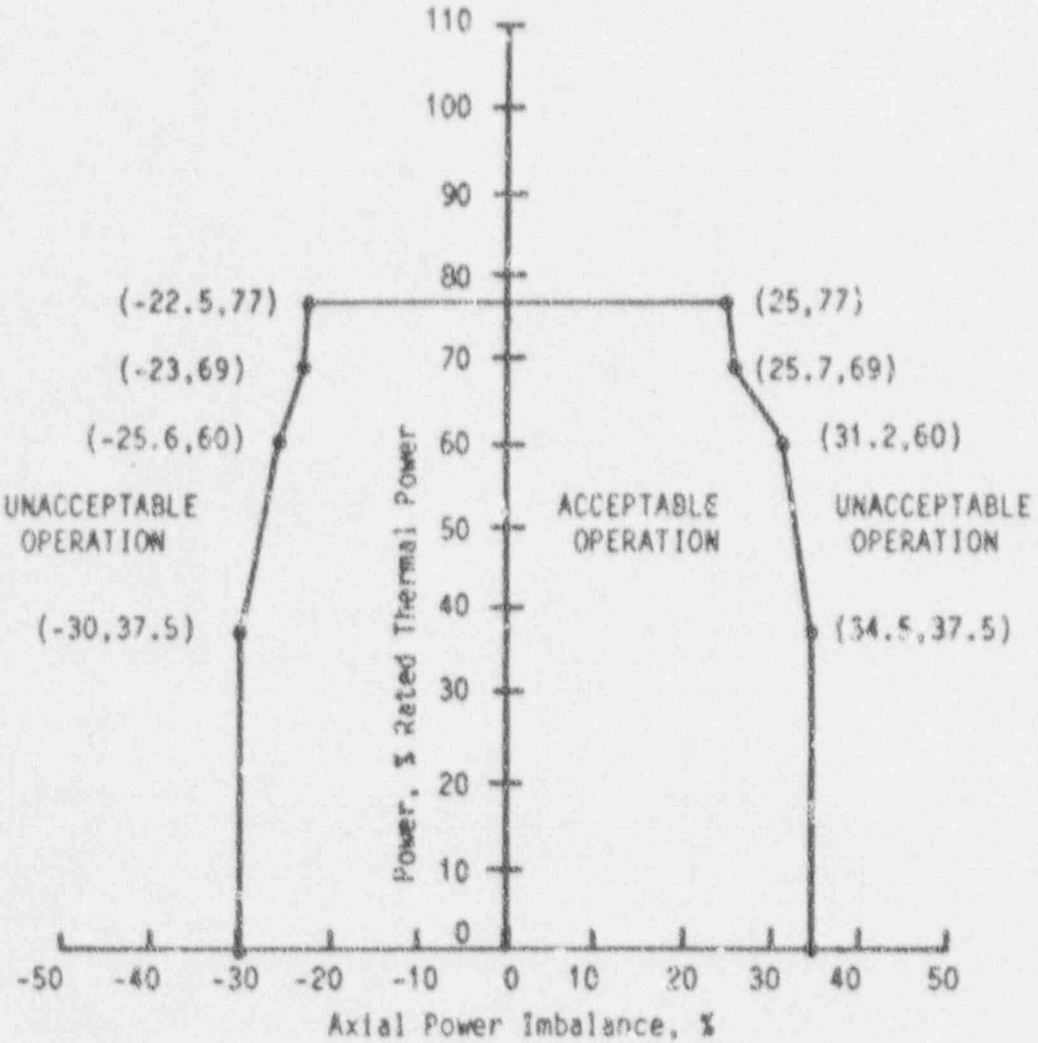
This figure referred to by Technical Specification 3.2.1

Figure 15

Rev. 3

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Three-Pump Operation From
100 +10/-0 to 525 ± 10 EFPD

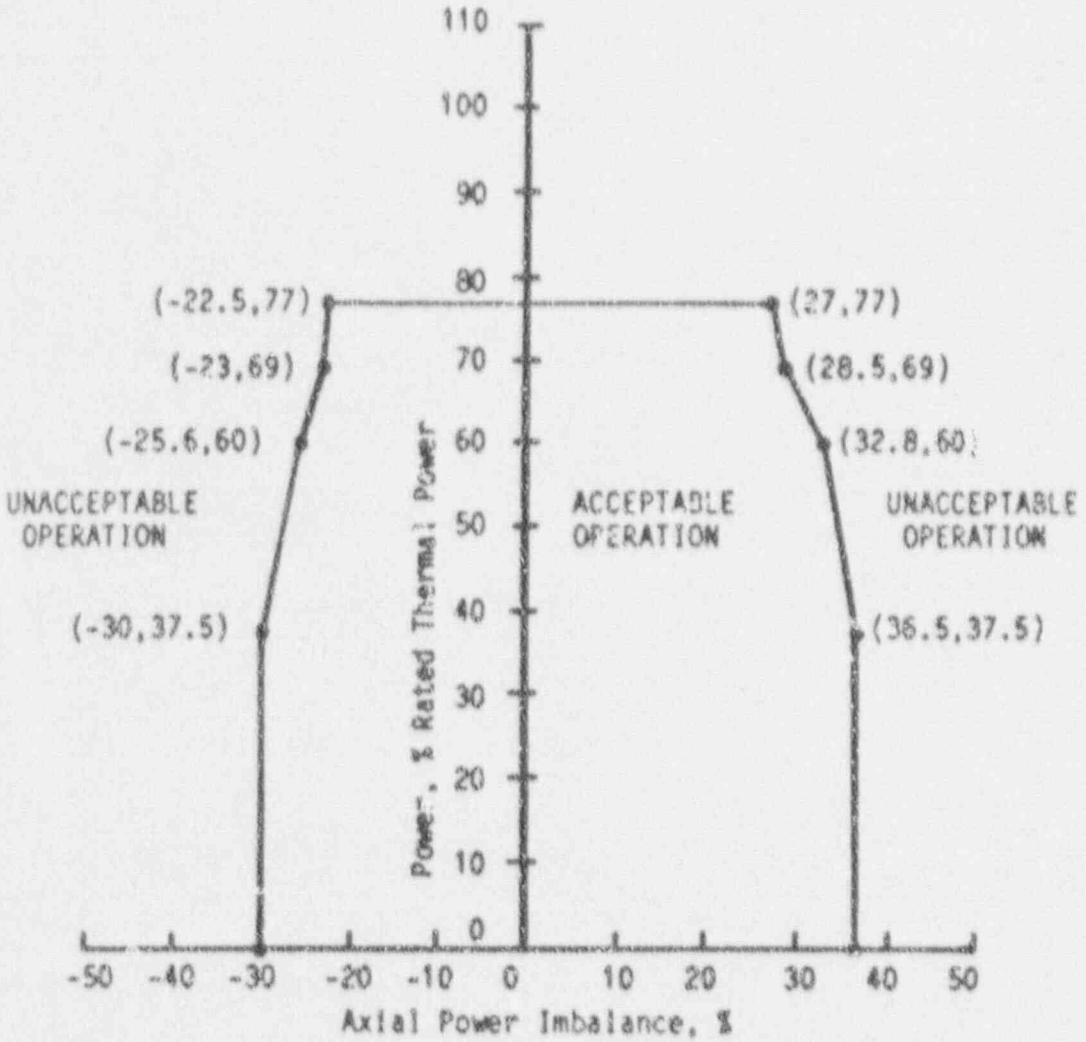


This figure referred to by Technical Specification 3.2.1

Figure 16

Crystal River 3, Cycle 8

Axial Power Imbalance Envelope for
Three-Pump Operation After
525 ± 10 EFPD



This figure referred to by Technical Specification 3.2.1

Figure 17

Rev. 3

QUADRANT POWER TILT LIMITS FOR THERMAL POWER ≤ 50% FULL POWER

	STEADY STATE LIMIT	TRANSIENT LIMIT	MAXIMUM LIMIT
QUADRANT POWER TILT as measured by:			
Symmetrical Incore Detector System	7.50	12.0	20.0
Power Range Channels	5.16	9.75	20.0
Minimum Incore Detector System	2.43*	4.95	20.0
Measurement Independent	8.58	14.50	20.0

QUADRANT POWER TILT LIMITS FOR THERMAL POWER > 50% FULL POWER

	STEADY STATE LIMIT	TRANSIENT LIMIT	MAXIMUM LIMIT
QUADRANT POWER TILT as measured by:			
Symmetrical Incore Detector System	4.25	10.03	20.0
Power Range Channels	1.96	6.96	20.0
Minimum Incore Detector System	1.50*	4.40	20.0
Measurement Independent	4.92	11.07	20.0

This table is referred to by Technical Specification 3.2.4

* Contains detectors that exceed 60% depletion criteria for minimum incore systems.

MODERATOR TEMPERATURE COEFFICIENT LIMITS

The moderator temperature coefficient (MTC) at RATED THERMAL POWER shall be less negative than:

Moderator Temperature Coefficient at HFP -3.24×10^{-4} $\Delta k/k/°F$

This limit is referred to by Technical Specification 3.1.1.3