

DUKE POWER COMPANY
OCONEE NUCLEAR STATION

OCONEE UNIT 2, CYCLE 9
CORE OPERATIONAL LIMITS REPORT

SRC-OS2-ND-86-003-0

MARCH 1986

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Oconee Unit 2, Cycle 9

Core Operational Limits Report

Per the requirements of Technical Specification 6.6.1.1, this Core Operational Limits Report has been prepared to provide the necessary limitations on reactor power, imbalance, and control rod position for operation of Oconee 2, Cycle 9. Curves presented in this report are based upon a cycle length of 400 EFPD. If the cycle length is expected to exceed 410 EFPD, an evaluation shall be performed in accordance with Technical Specification 3.5.2.9 in order to verify the continued validity of the curves presented in this report. Any required changes to the operational limit curves due to extended operation or other causes shall be implemented in accordance with Technical Specification 6.6.1.1.

Figure 1 provides the operational limits upon power and power imbalance. The power-imbalance envelope is determined by the most limiting power distribution criteria of either the loss of coolant accident (LOCA) analyses or the loss of flow accident (LOFA) analyses. Requirements on surveillance and actions required to respond to plant conditions outside of the acceptable power-imbalance envelope are provided in Technical Specification 3.5.2.

Figures 2 thru 4 provide the control rod position limits for operation with 4, 3, and 2 reactor coolant pumps in operation. The rod insertion limits ensure the shutdown margin requirements of Technical Specification 3.1.11 are satisfied and therefore provides for achieving hot shutdown by reactor trip at any time (assuming the highest worth control rod remains in the full out position). Rod position limits also ensure that power peaking criteria associated with LOCA and LOFA analyses are not exceeded. In addition, the limits preclude the insertion of rod groups which could result in any single rod worth greater than the safety analysis assumption for the rod ejection transient. Requirements on surveillance and actions required to respond to plant conditions outside the acceptable restricted operation regions are provided in Technical Specification 3.5.2. The power-level-cutoff values associated with the Technical Specification 3.5.2.6, Xenon Reactivity, are provided by the rod position limit curves of Figure 2.

Due to the low worth of Inconel-600 axial power shaping rods (APSR's) no position limits on the APSR's are required for this cycle.

Table 1 provides the bounding values of allowable LOCA peak linear heat rates used to determine the operational power-imbalance envelope and control rod position limits.

Table 1

Limiting LOCA Linear Heat Rates

Elevation ft	LOCA LHR Limits , KW/ft		
	0 - 1000 MWD/MTU	1000 - 2600 MWD/MTU	After 2600 MWD/MTU
2	13.5	15.0	15.5
4	16.1	16.6	16.6
6	16.5	18.0	18.0
8	17.0	17.0	17.0
10	16.0	16.0	16.0

FIGURE 1

02C9

Operational Power-Imbalance Limits, 0 EFPD to EOC

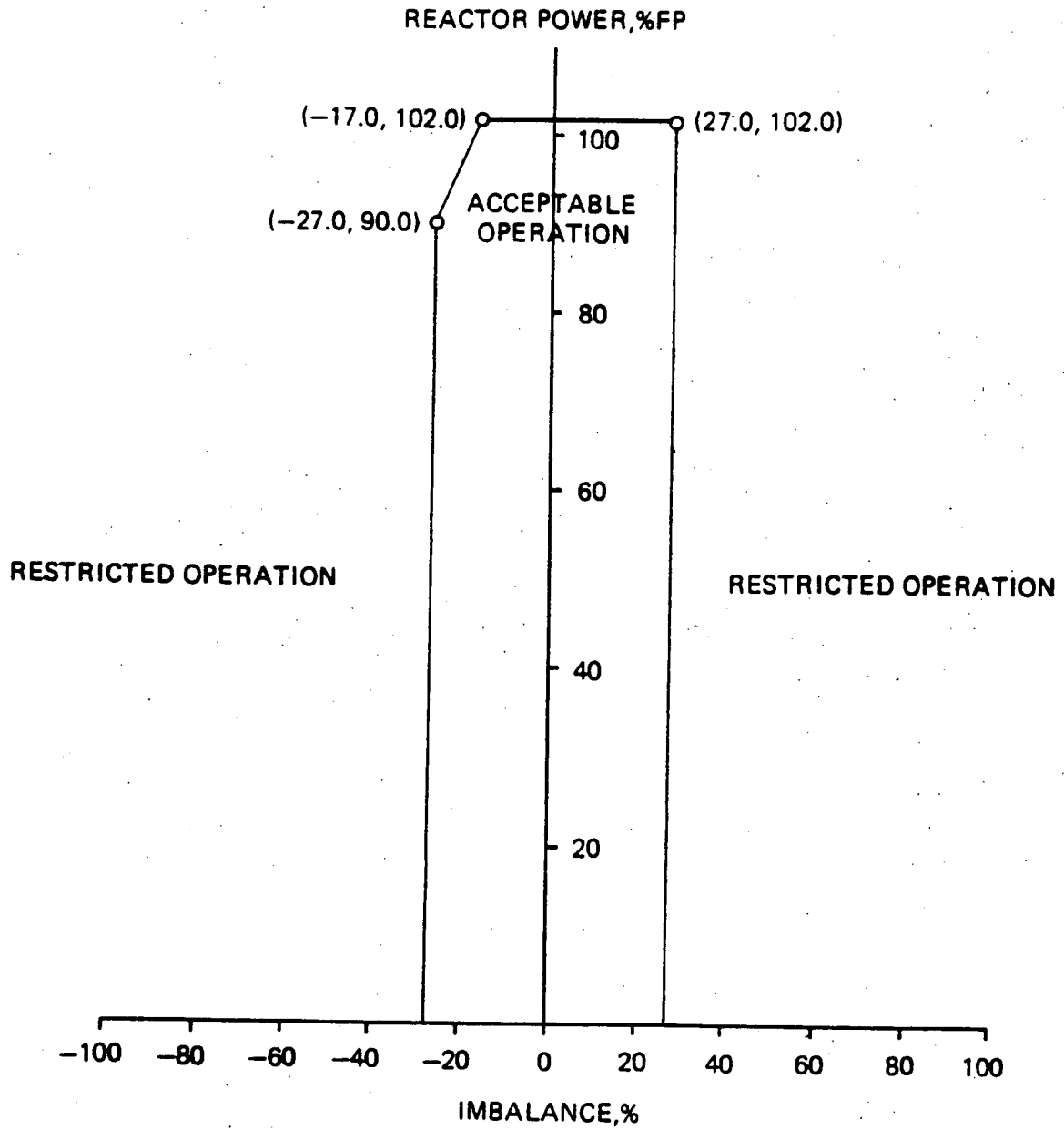


FIGURE 2

02C9

Control Rod Position Limits, 4 Pumps, 0 EFPD to EOC

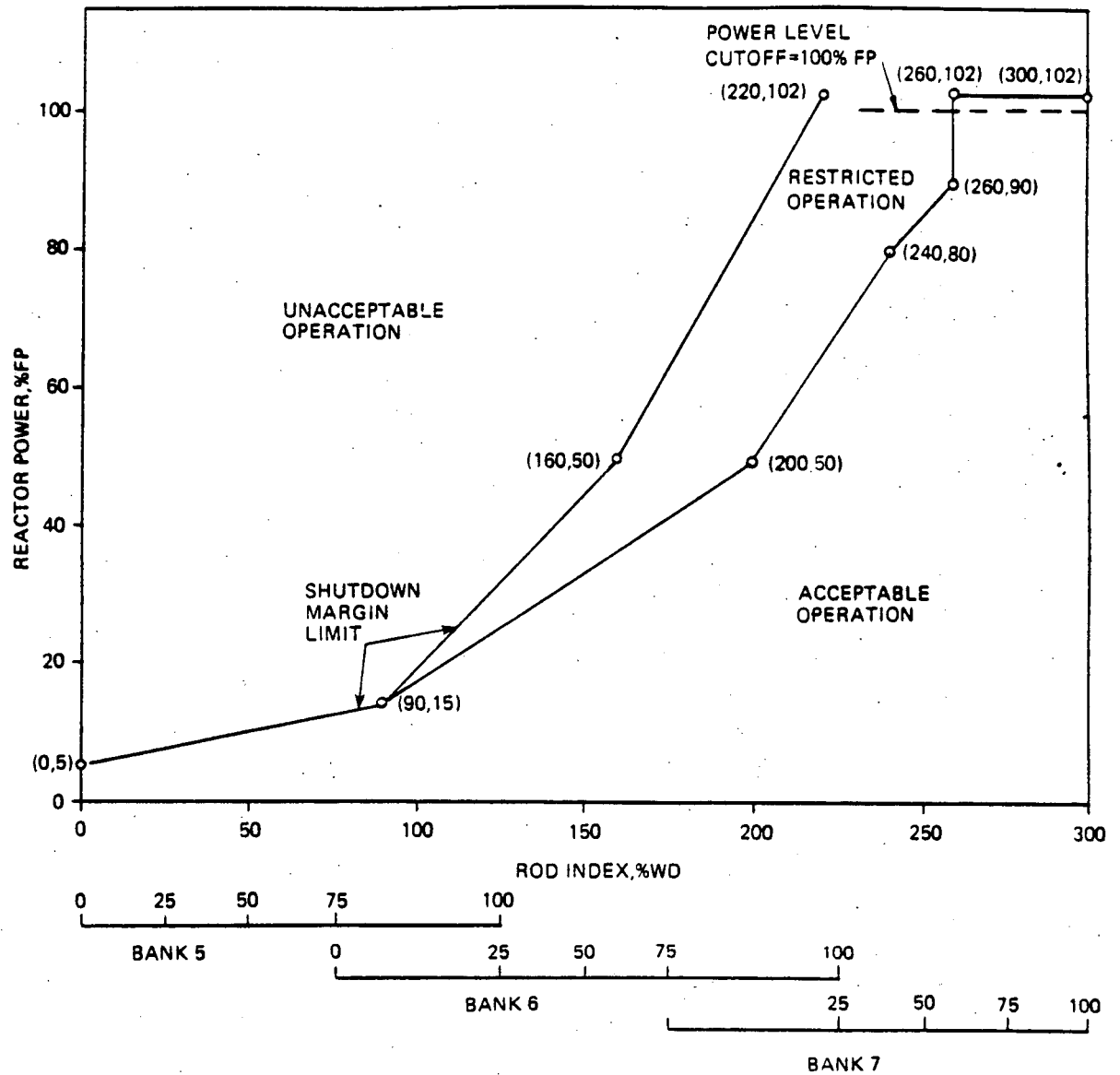


FIGURE 3

02C9

Control Rod Position Limits, 3 Pumps, 0 EFPD to EOC

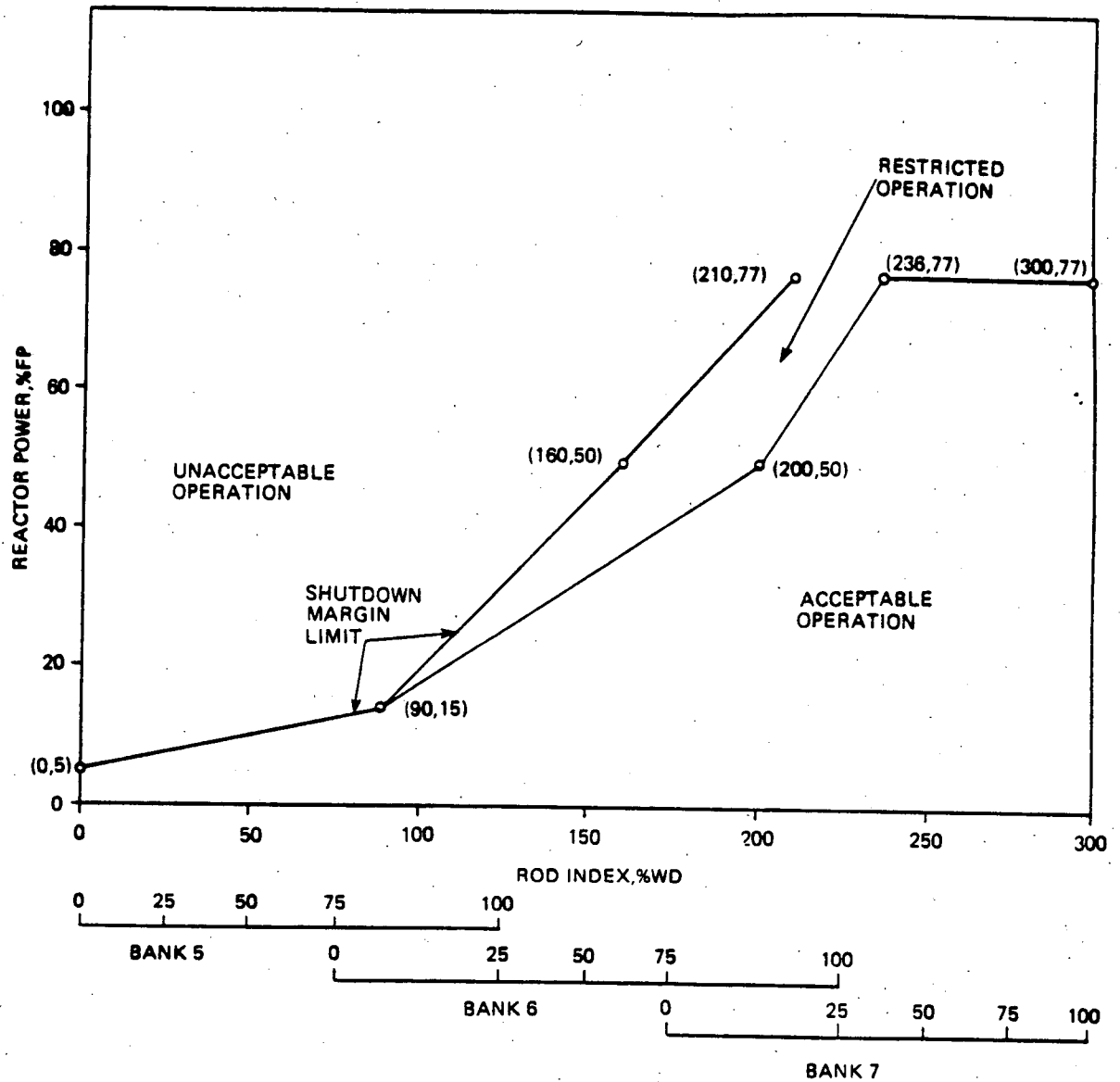
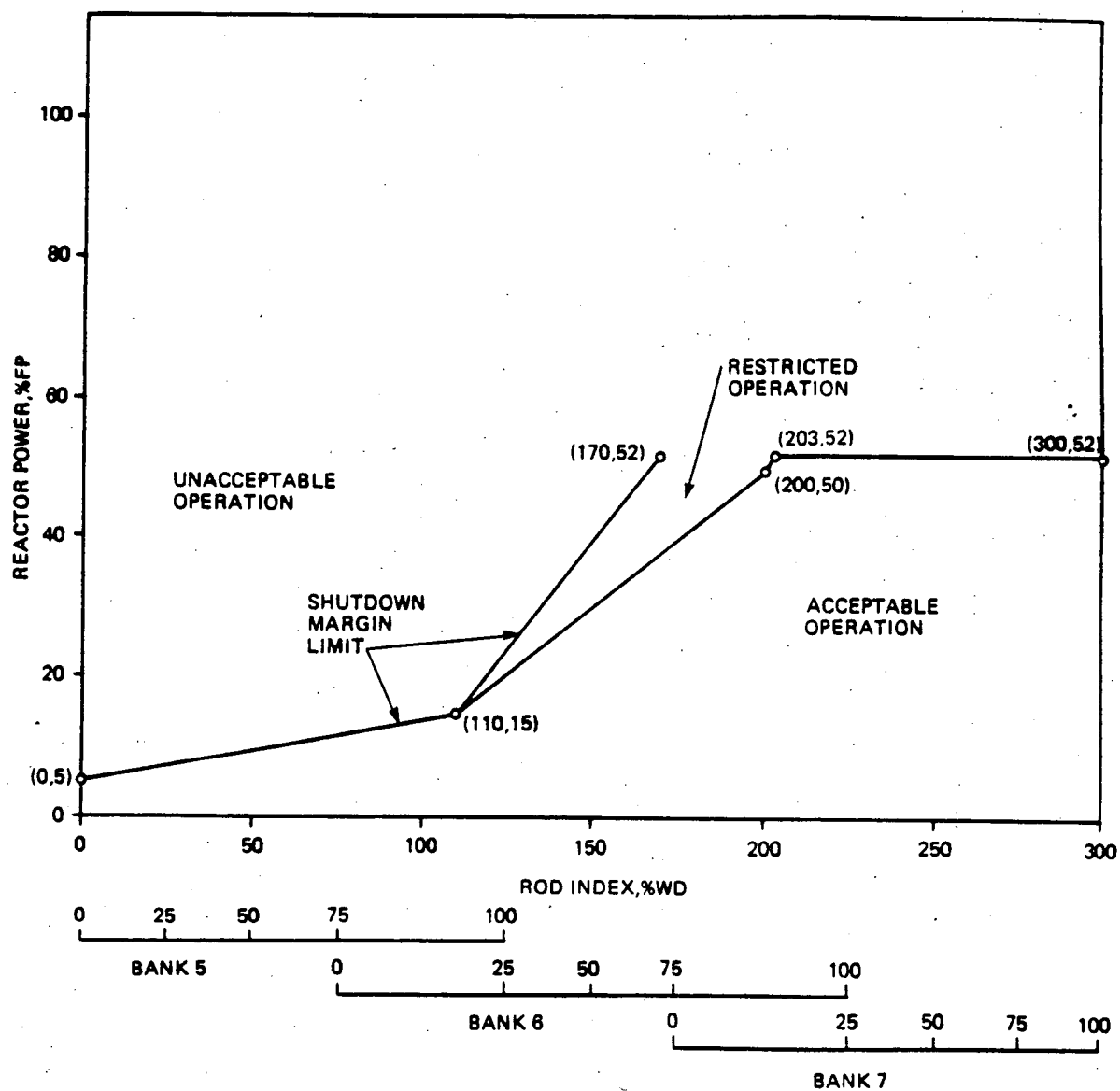


FIGURE 4

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Control Rod Position Limits, 2 Pumps, 0 EFPD to EOC



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OCONEE UNIT 3, CYCLE 9
CORE OPERATIONAL LIMITS REPORT

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OCTOBER 1985

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Oconee Unit 3, Cycle 9

Core Operational Limits Report

For the requirements of Technical Specification 5.6.1.1, this Core Operational Limits Report has been prepared to provide the necessary limitations on reactor power, imbalance, and control rod position for operation of Oconee 3, Cycle 9. Curves presented in this report are based upon a cycle length of 400 EFPD. If the cycle length is expected to exceed 400 EFPD, an evaluation shall be performed in accordance with Technical Specification 3.5.2.9 in order to verify the continued validity of the curves presented in this report. Any required changes to the operational limit curves due to extended operation or other causes shall be implemented in accordance with Technical Specification 5.6.1.1.

Figure 1 provides the operational limits upon power and power imbalance. The power-imbalance envelope is determined by the most limiting power distribution criteria of either the loss of coolant accident (LOCA) analyses or the loss of flow accident (LOFA) analyses. Requirements on surveillance and actions required to respond to plant conditions outside of the acceptable power-imbalance envelope are provided in Technical Specification 3.5.2.

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Table 1 provides the bounding values of allowable LOCA peak linear heat rates used to determine the operational power-imbalance envelope and control rod position limits.

Oconee Unit 3, Cycle 9

Table 1

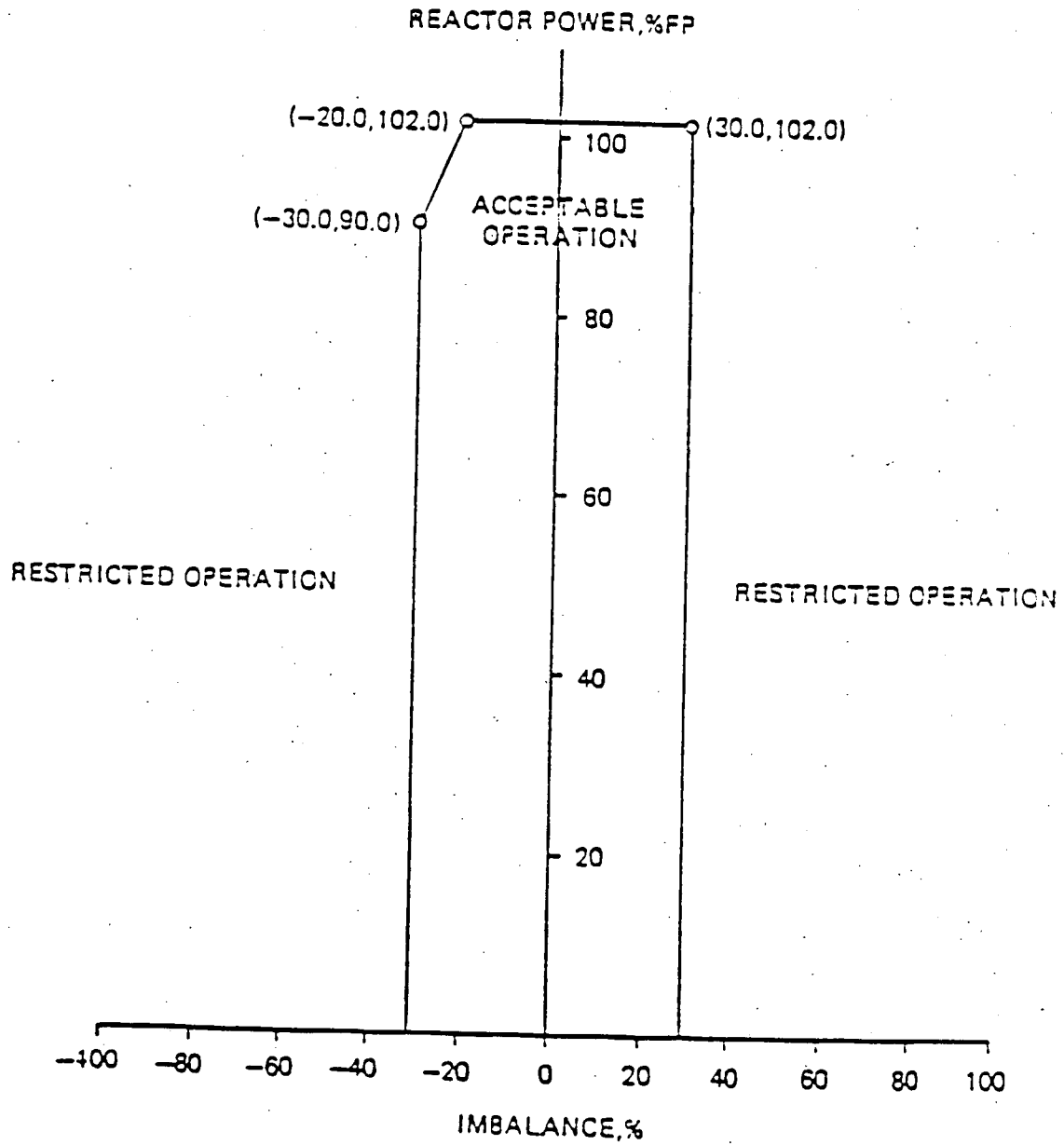
Limiting LOCA Linear Heat Rates

Elevation ft	LOCA LHR Limits, kW/ft		
	0 - 1000 MWD/MTU	1000 - 2500 MWD/MTU	After 2500 MWD/MTU
2	15.5	15.0	15.5
4	15.1	15.5	15.5
6	16.5	19.0	15.0
8	17.0	17.0	17.0
10	16.0	16.0	16.0

Oconee Unit 3, Cycle 9

FIGURE 1

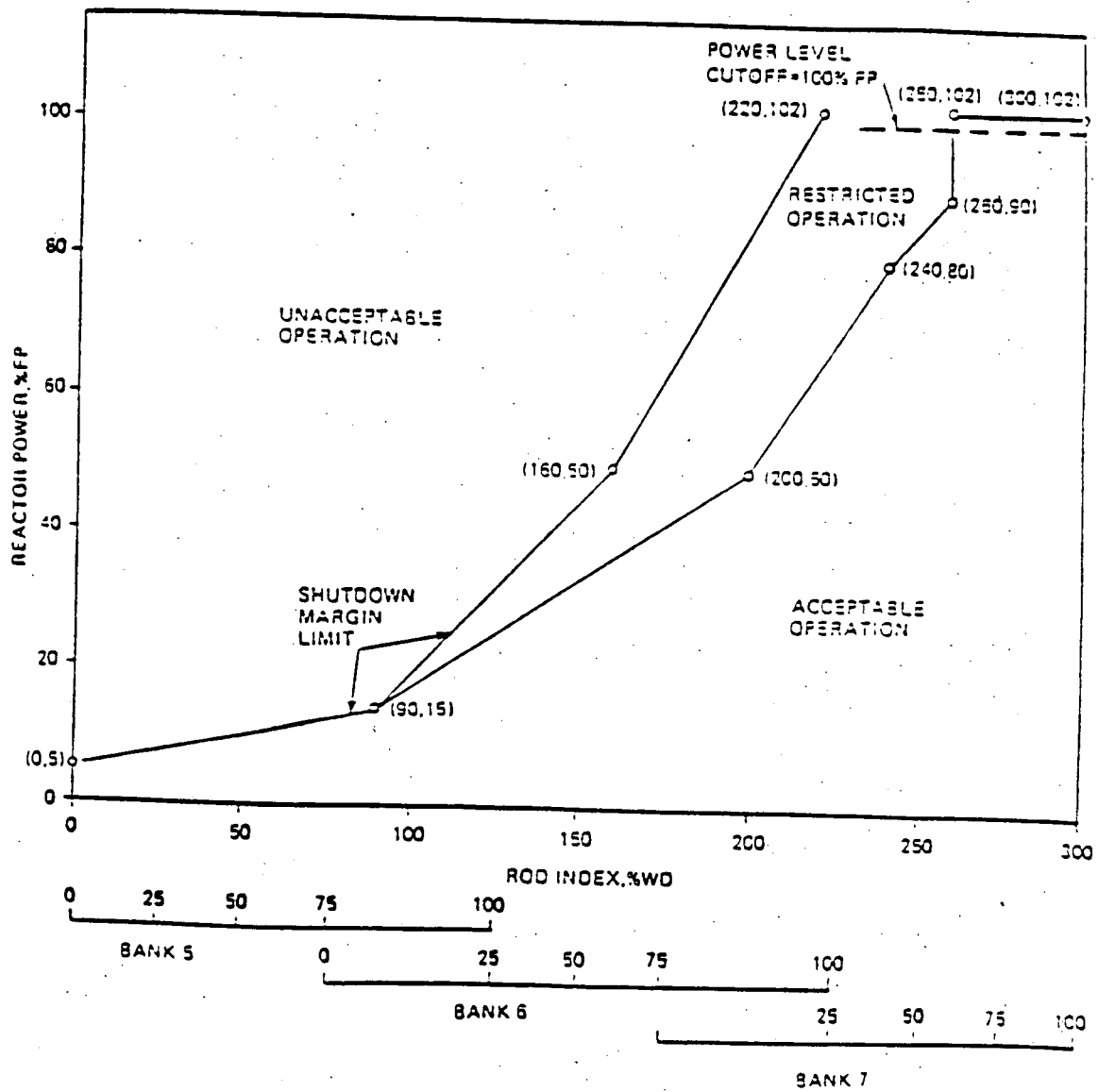
OPERATIONAL POWER-IMBALANCE LIMITS, 0 EFPD TO EOC



Oconee Unit 3, Cycle 9

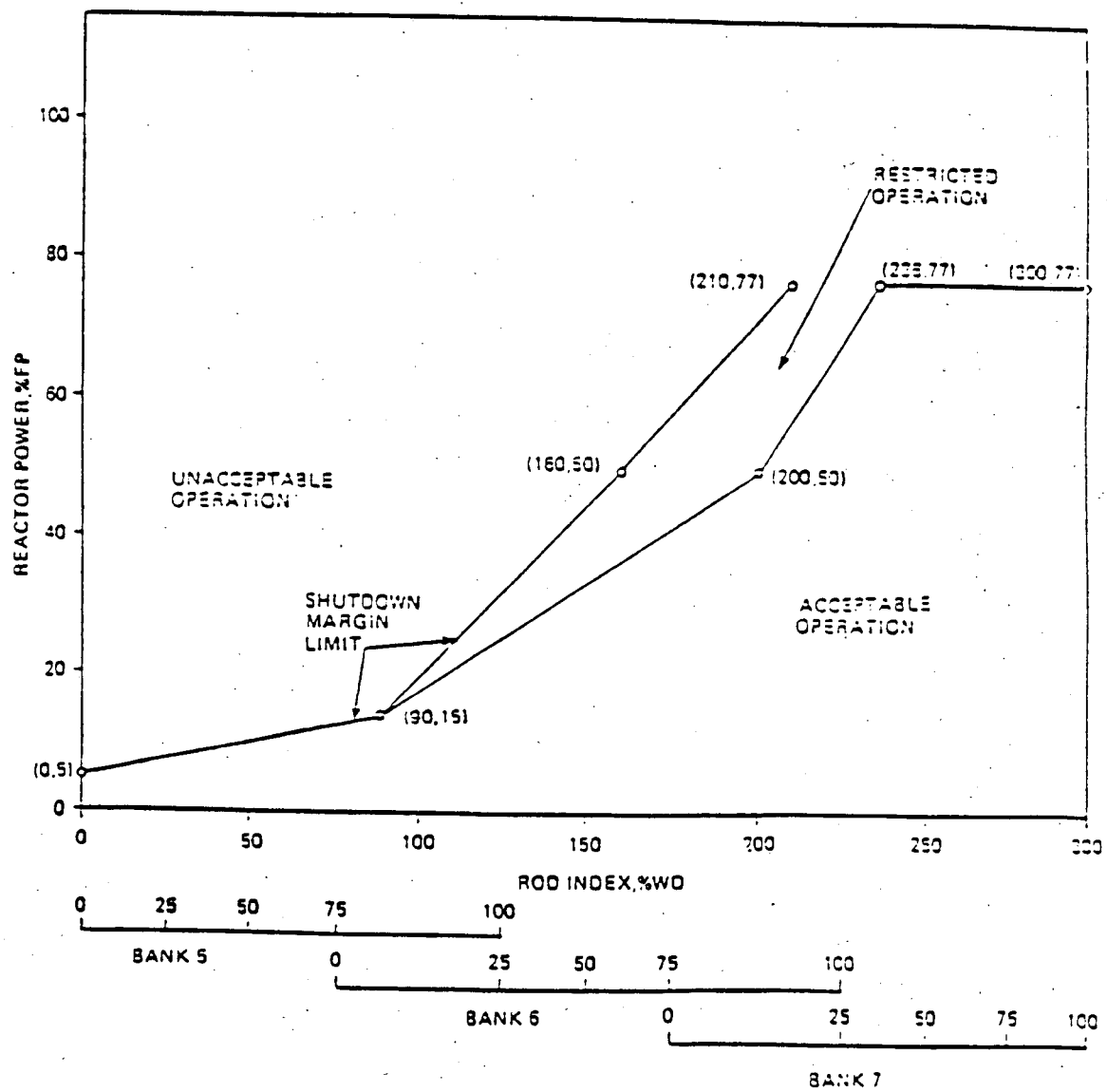
FIGURE 2

CONTROL ROD POSITION LIMITS, 4 PUMPS, 0 EFPD TO EOC



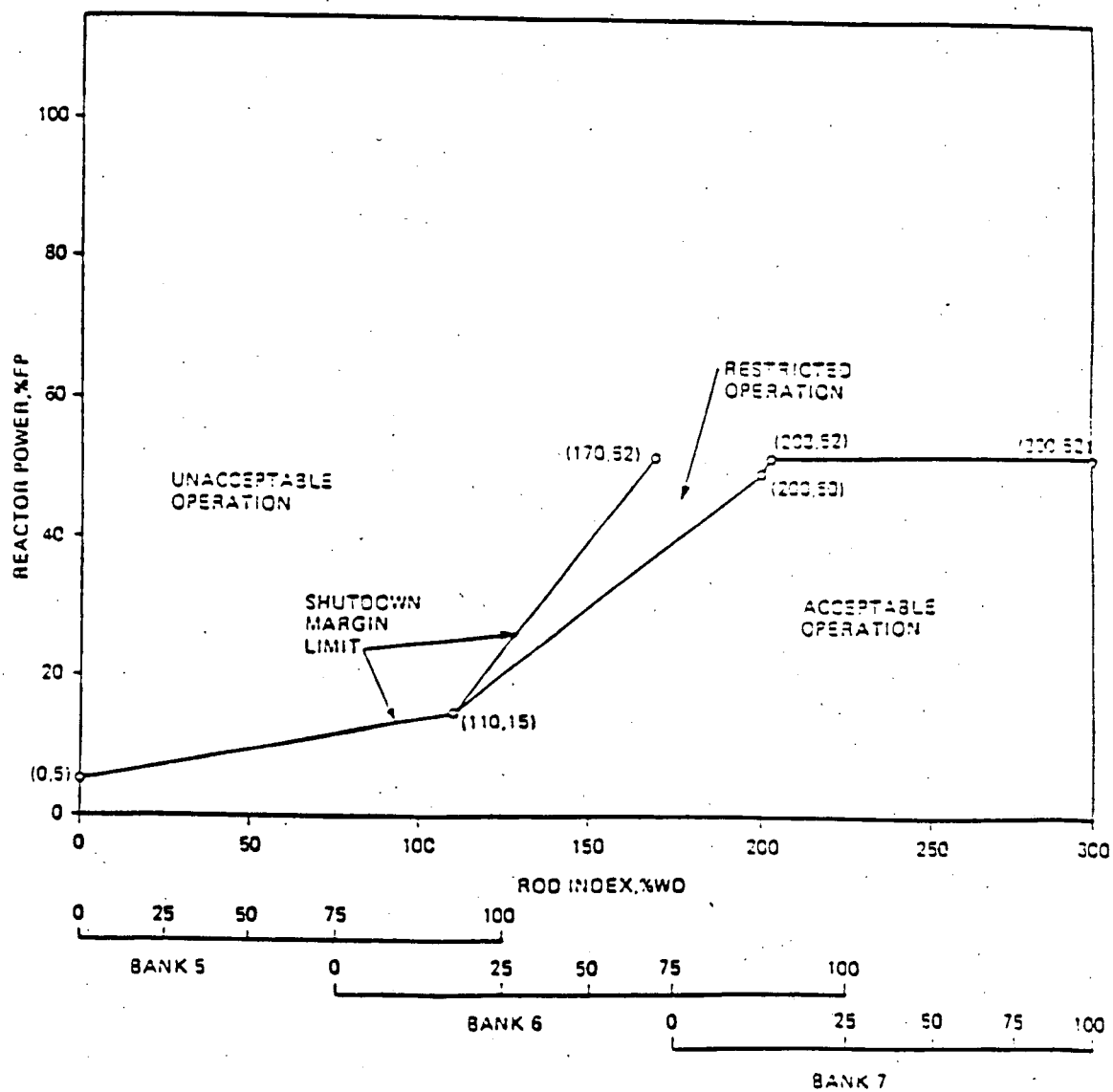
Oconee Unit 3, Cycle 9

FIGURE 3
CONTROL ROD POSITION LIMITS, 3 PUMPS, 0 EFPD TO EOC



Oconee Unit 3, Cycle 9

FIGURE 4
CONTROL ROD POSITION LIMITS, 2 PUMPS, 0 EFPD TO EOC



DUKE POWER COMPANY

OCONEE NUCLEAR STATION

ATTACHMENT 5

OCONEE 2, CYCLE 9 RELOAD REPORT