ATTACHMENT 1

DUKE POWER COMPANY
OCONEE NUCLEAR STATION

Proposed Technical Specification Revision

Oconee 2, Cycle 6

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1. The 1.30 DNBR limit produced by the combination of the radial peak, axial peak and position of the axial peak that yields no less than a 1.30 DNBR.

2. The combination of radial and axial peak that causes central fuel melting at the hot spot. The limit is 20.15 kw/ft for Unit 2.

Power peaking is not a directly observable quantity, and therefore, limits have been established on the basis of the reactor power imbalance produced by the power peaking.

The specified flow rates for Curves 1, 2, and 3 of Figure 2.1-2B correspond to the expected minimum flow rates with four pumps, three pumps, and one pump in each loop, respectively.

The curve of Figure 2.1-1B is the most restrictive of all possible reactor coolant pump-maximum thermal power combinations shown in Figure 2.1-3B.

The magnitude of the rod bow penalty applied to each fuel cycle is equal to or greater than the necessary burnup independent DNBR rod bow penalty for the applicable cycle minus a credit of 1% for the flow area reduction factor used in the hot channel analysis.

All plant operating limits are presently based on an original method of calculating rod bow penalties that are more conservative than those that would be obtained with new approved procedures. For Cycle 6 operation, this subrogation results in a 10% DNBR margin, which is partially used to offset the reduction in DNBR due to fuel rod bowing.

The maximum thermal power for three-pump operation is 90.606 percent due to a power level trip produced by the flux-flow ratio 74.7 percent flow x 1.08 = 80.68 percent power plus the maximum calibration and instrument error. The maximum thermal power for other coolant pump conditions is produced in a similar manner.

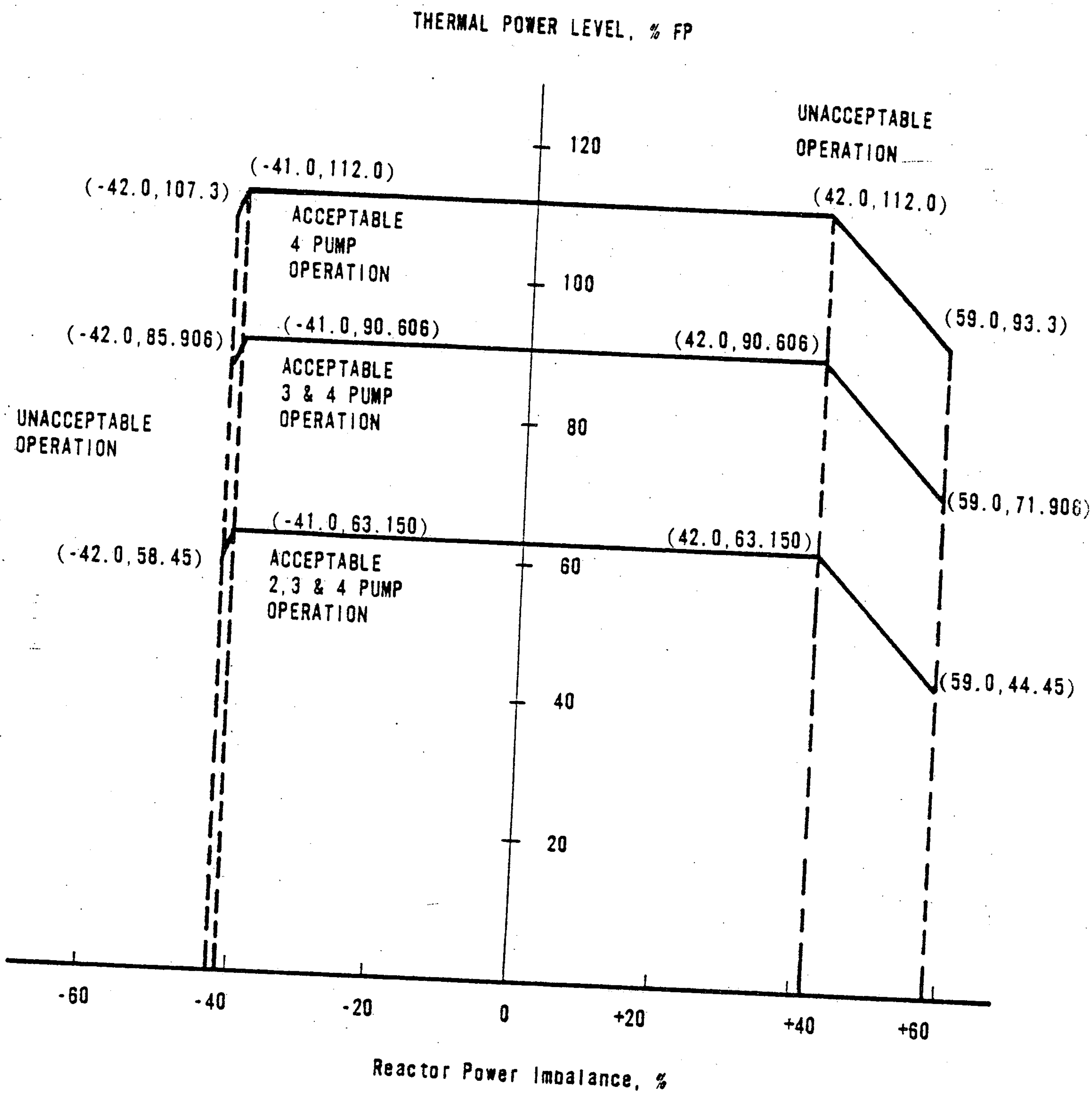
For each curve of Figure 2.1-3B, a pressure-temperature point above and to the left of the curve would result in a DNBR greater than 1.30 or a local quality at the point of minimum DNBR less than 22 percent for that particular reactor coolant pump situation. The 1.30 DNBR curve for four-pump operation is more restrictive than any other reactor coolant pump situation because any pressure/temperature point above and to the left of the four-pump curve will be above and to the left of the other curves.

References

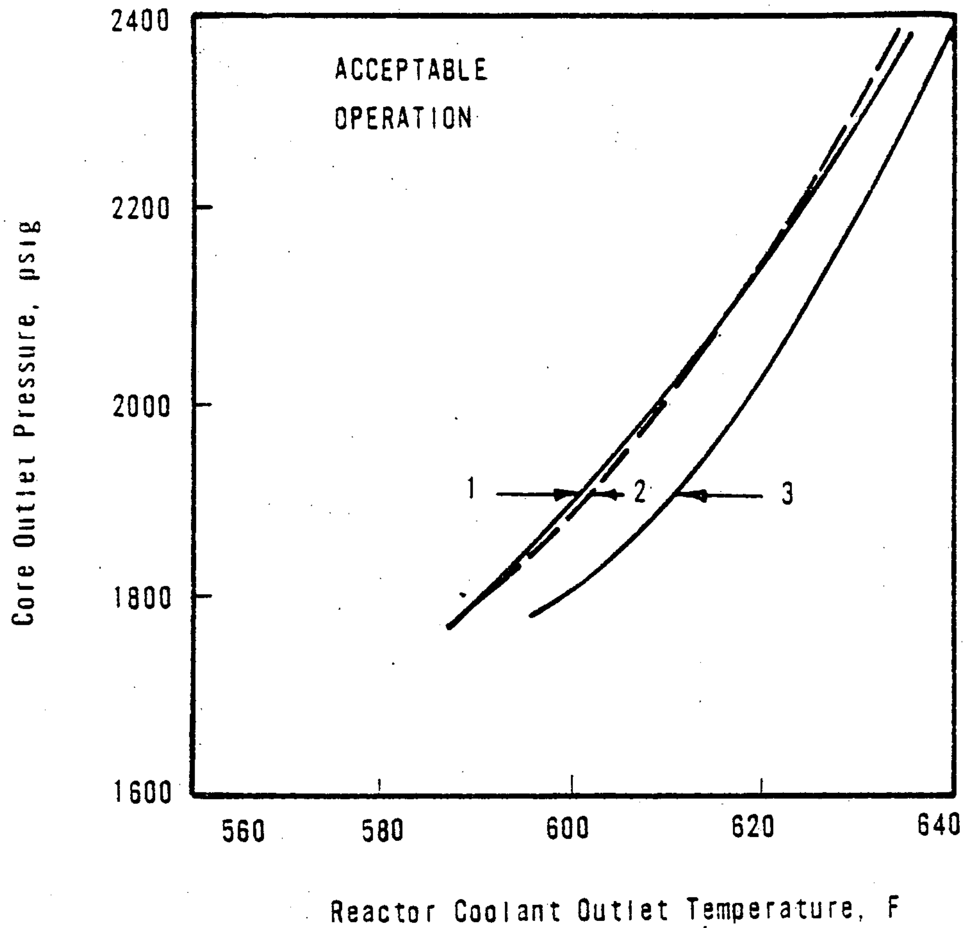
(1) Correlation of Critical Heat Flux in a Bundle Cooled by Pressurized Water, BAW-10000, March 1970.

(2) Oconee 2, Cycle 4 - Reload Report - BAW-1491, August 1978.

(3) Oconee 2, Cycle 5 - Reload Report - BAW-1565.

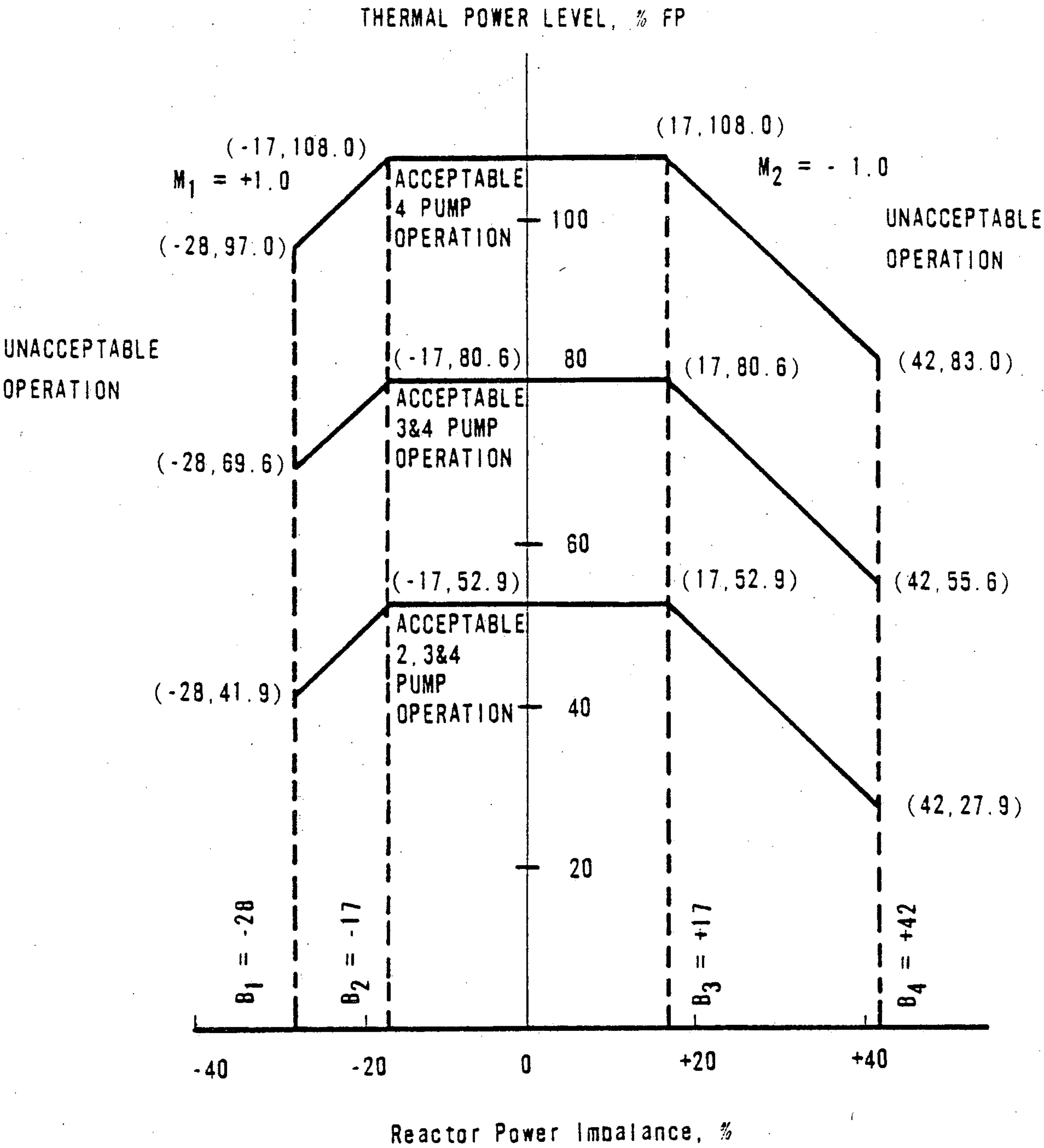


CORE PROTECTION SAFETY LIMITS
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 2.1-2B



CURVE	COOLANT FLOW, GPM	POWER, %	PUMPS OPERATING	TYPE OF LIMIT
1	374,880 (100%)	112	4	DNBR
2	280,035 (74.7%)	90.606	3	DNBR
3	183,690 (49.0%)	63.150	1 PER LOOP	QUALITY

CORE PROTECTION SAFETY LIMITS
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 2.1-3B



PROTECTIVE SYSTEM
MAXIMUM ALLOWABLE SETPOINTS
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 2.3-2B

Bases

The high pressure injection system and chemical addition system provide control of the reactor coolant system boron concentration.(1) This is normally accomplished by using any of the three high pressure injection pumps in series with a boric acid pump associated with either the boric acid mix tank or the concentrated boric acid storage tank. An alternate method of boration will be the use of the high pressure injection pumps taking suction directly from the borated water storage tank.(2)

The quantity of boric acid in storage in the concentrated boric acid storage tank or the borated water storage tank is sufficient to borate the reactor coolant system to a 1% $\Delta k/k$ subcritical margin at cold conditions (70°F) with the maximum worth stuck rod and no credit for xenon at the worst time in core life. The current cycles for each unit, Oconee 1, Cycle 7, Oconee 2, Cycle 6, and Oconee 3, Cycle 6 were analyzed with the most limiting case selected as the basis for all three units. Since only the present cycles were analyzed, the specifications will be re-evaluated with each reload. A minimum of 1020 ft^3 of 8,700 ppm boric acid in the concentrated boric acid storage tank, or a minimum of 350,000 gallons of 1835 ppm boric acid in the borated water storage tank (3) will satisfy the requirements. The volume requirements include a 10% margin and, in addition, allow for a deviation of 10 EFPD in the cycle length. The specification assures that two supplies are available whenever the reactor is critical so that a single failure will not prevent boration to a cold condition. The required amount of boric acid can be added in several ways. Using only one 10 gpm boric acid pump taking suction from the concentrated boric acid storage tank would require approximately 12.7 hours to inject the required boron. An alternate method of addition is to inject boric acid from the borated water storage tank using the makeup pumps. The required boric acid can be injected in less than six hours using only one of the makeup pumps.

The concentration of boron in the concentrated boric acid storage tank may be higher than the concentration which would crystallize at ambient conditions. For this reason, and to assure a flow of boric acid is available when needed, these tanks and their associated piping will be kept at least 10°F above the crystallization temperature for the concentration present. The boric acid concentration of 8,700 ppm in the concentrated boric acid storage tank corresponds to a crystallization temperature of 77°F and therefore a temperature requirement of 87°F. Once in the high pressure injection system, the concentrate is sufficiently well mixed and diluted so that normal system temperatures assure boric acid solubility.

REFERENCES

(1) FSAR, Section 9.1; 9.2
(2) FSAR, Figure 6.2
(3) Technical Specification 3.3

f. If the maximum positive quadrant power tilt exceeds the Maximum Limit of Table 3.5-1, the reactor shall be shut down within 4 hours. Subsequent reactor operation is permitted for the purpose of measurement, testing, and corrective action provided the thermal power and the Nuclear Overpower Trip Setpoints allowable for the reactor coolant pump combination are restricted by a reduction of 2% of thermal power for each 1% tilt for the maximum tilt observed prior to shutdown.

g. Quadrant power tilt shall be monitored on a minimum frequency of once every 2 hours during power operation above 15% full power.

3.5.2.5 Control Rod Positions

a. Technical Specification 3.1.3.5 does not prohibit the exercising of individual safety rods as required by Table 4.1-2 or apply to inoperable safety rod limits in Technical Specification 3.5.2.2.

b. Except for physics tests, operating rod group overlap shall be 25% ± 5% between two sequential groups. If this limit is exceeded, corrective measures shall be taken immediately to achieve an acceptable overlap. Acceptable overlap shall be attained within two hours or the reactor shall be placed in a hot shutdown condition within an additional 12 hours.

c. Position limits are specified for regulating and axial power shaping control rods. Except for physics tests or exercising control rods, the regulating control rod insertion/withdrawal limits are specified on figures 3.5.2-1A1, 3.5.2-1A2, and 3.5.2-1A3 (Unit 1); 3.5.2-1B1, 3.5.2-1B2, and 3.5.2-1B3 (Unit 2); 3.5.2-1C1, 3.5.2-1C2 and 3.5.2-1C3 (Unit 3) for four pump operation, on figures 3.5.2-2A1, 3.5.2-2A2, and 3.5.2-2A3 (Unit 1); 3.5.2-2B1, 3.5.2-2B2, and 3.5.2-2B3 (Unit 2) for three pump operation, on figures 3.5.2-2A4, 3.5.2-2A5, and 3.5.2-2A6 (Unit 1); 3.5.2-2B4, 3.5.2-2B5, and 3.5.2-2B6 (Unit 2) for two pump operation, and on figures 3.5.2-2C1, 3.5.2-2C2 and 3.5.2-2C3 (Unit 3) for two or three pump operation. Also, excepting physics tests or exercising control rods, the axial power shaping control rod insertion/withdrawal limits are specified on figures 3.5.2-4A1, 3.5.2-4A2, and 3.5.2-4A3 (Unit 1); 3.5.2-4B1, and 3.5.2-4B2, and 3.5.2-4B3, (Unit 2); 3.5.2-4C1, 3.5.2-4C2, and 3.5.2-4C3 (Unit 3).

If the control rod position limits are exceeded, corrective measures shall be taken immediately to achieve an acceptable control rod position. An acceptable control rod position shall then be attained within two hours. The minimum shutdown margin required by Specification 3.5.2.1 shall be maintained at all times.

3.5.2.6 Xenon Reactivity

Except for physics tests, reactor power shall not be increased above the power-level-cutoff shown in Figures 3.5.2-1A1, 3.5.2-1A2, and 3.5.2-1A3 for Unit 1; Figures 3.5.2-1B1, 3.5.2-1B2, and 3.5.2-1B3, for Unit 2; and Figures 3.5.2-1C1, 3.5.2-1C2, and 3.5.2-1C3 for Unit 3 unless one of the following conditions is satisfied:

1. Xenon reactivity did not deviate more than 10 percent from the equilibrium value for operation at steady state power.

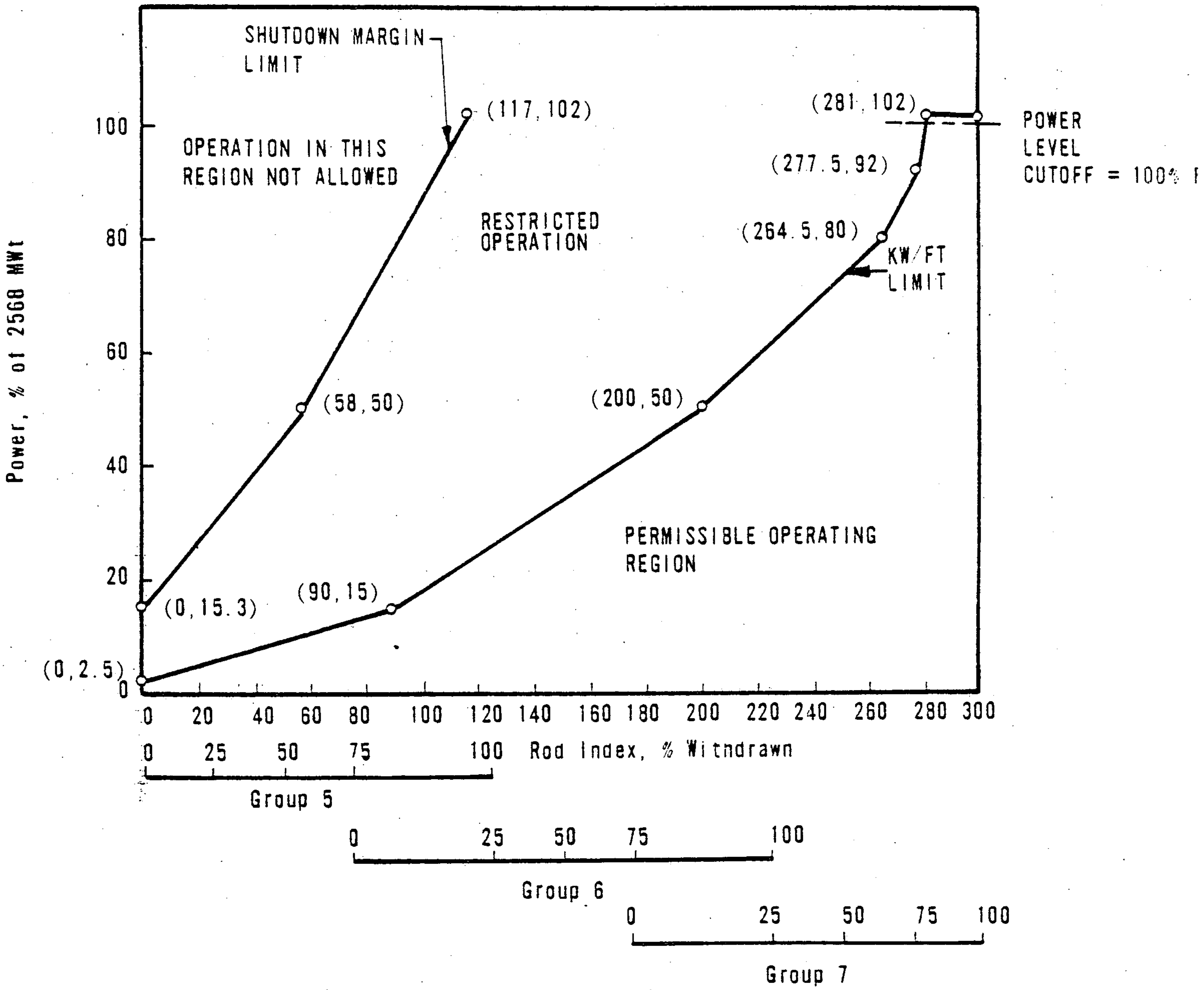
2. Xenon reactivity deviated more than 10 percent but is now within 10 percent of the equilibrium value for operation at steady state rated power and has passed its final maximum or minimum peak during its approach to its equilibrium value for operation at the power level cutoff.

3. Except for xenon free startup (when 2. applies), the reactor has operated within a range of 87 to 92 percent of rated thermal power for a period exceeding 2 hours.

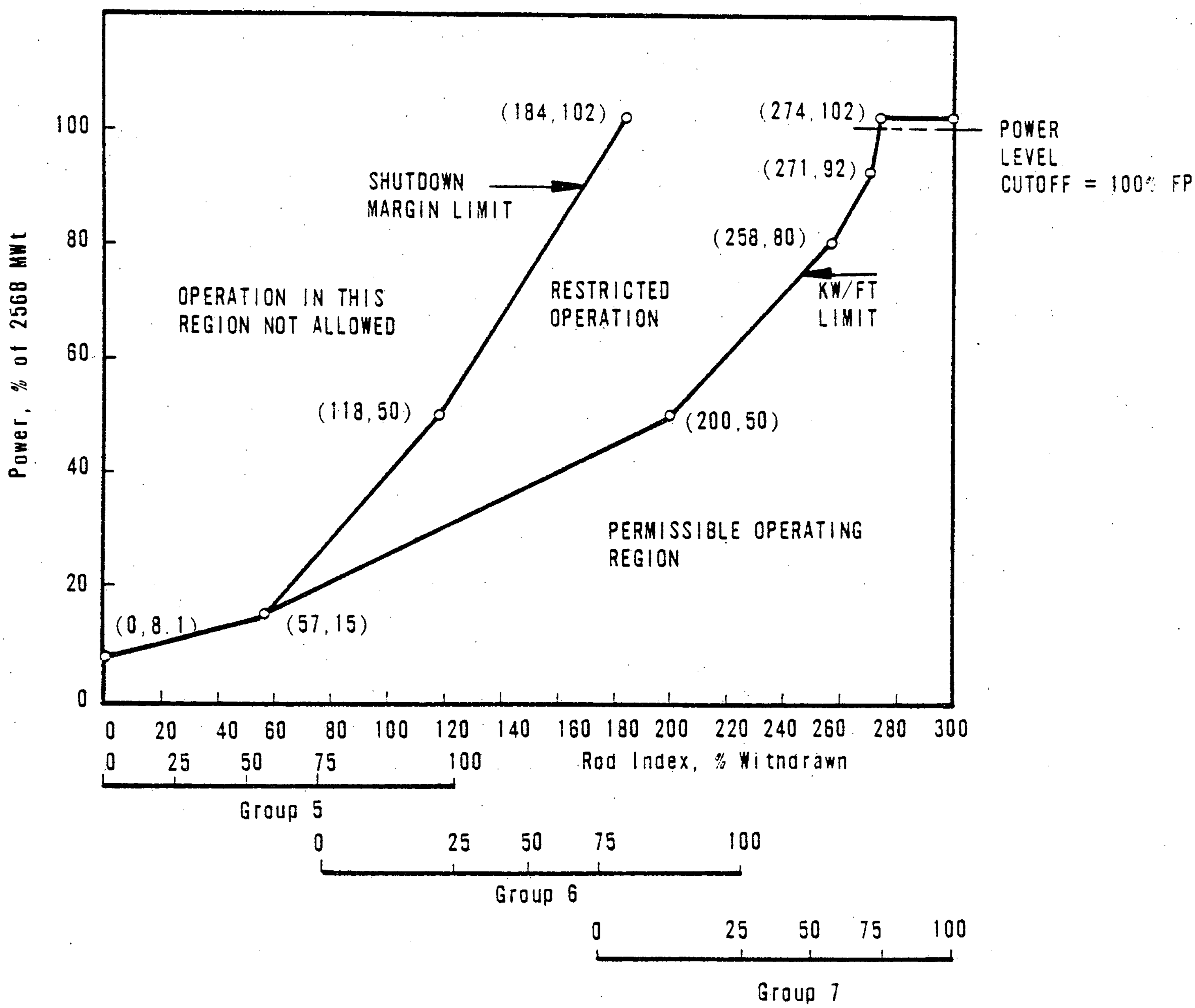
3.5.2.7 Reactor power imbalance shall be monitored on a frequency not to exceed two hours during power operation above 40 percent rated power. Except for physics tests, imbalance shall be maintained within the envelope defined by Figures 3.5.2-3A1, 3.5.2-3A2, 3.5.2-3A3, 3.5.3-3B1, 3.5.3-3B2, 3.5.2-3B3, 3.5.2-3C1, 3.5.2-3C2, and 3.5.2-3C3. If the imbalance is not within the envelope defined by these figures, corrective measures shall be taken to achieve an acceptable imbalance. If an acceptable imbalance is not achieved within two hours, reactor power shall be reduced until imbalance limits are met.

3.5.2.8 The control rod drive patch panels shall be locked at all times with limited access to be authorized by the manager or his designated alternate.

3.5.2.9 The operational limit curves of Technical Specifications 3.5.2.5.c and 3.5.2.7 are valid for a nominal design cycle length, as defined in the Safety Evaluation Report for the appropriate unit and cycle. Operational beyond the nominal design cycle length is permitted provided that an evaluation is performed to verify that the operational limit curves are valid for extended operation. If the operational limit curves are not valid for the extended period of the operation, appropriate limits will be established and the Technical Specification curves will be modified as required.



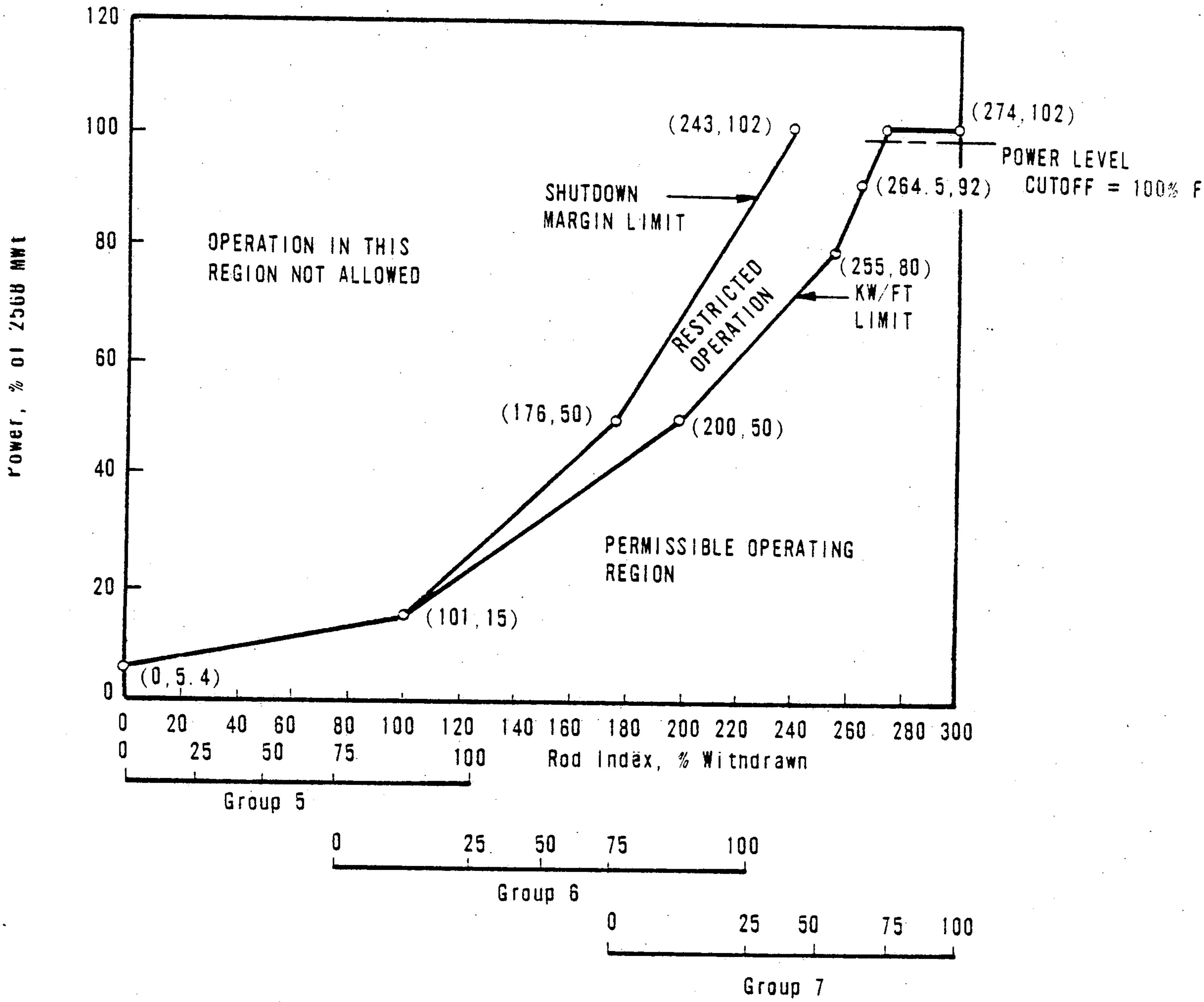
ROD POSITION LIMITS
FOR FOUR PUMP OPERATION
FROM 0 to 50 (+10, -0) EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-1B1



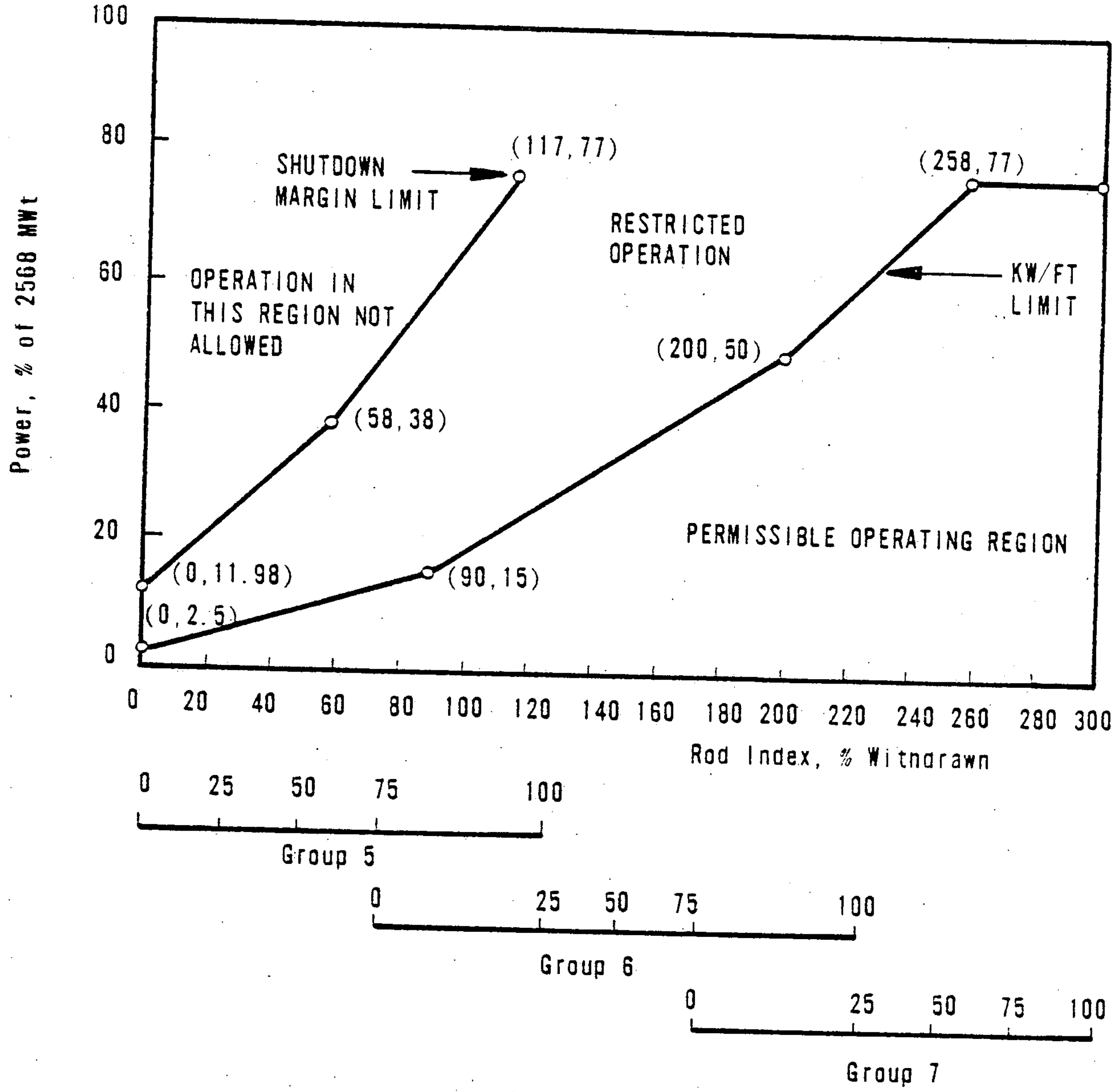
ROD POSITION LIMITS
FOR FOUR PUMP OPERATION
FROM 50 (+10, -0) to 225 ±10 EFPD
UNIT 2

OCONEE NUCLEAR STATION

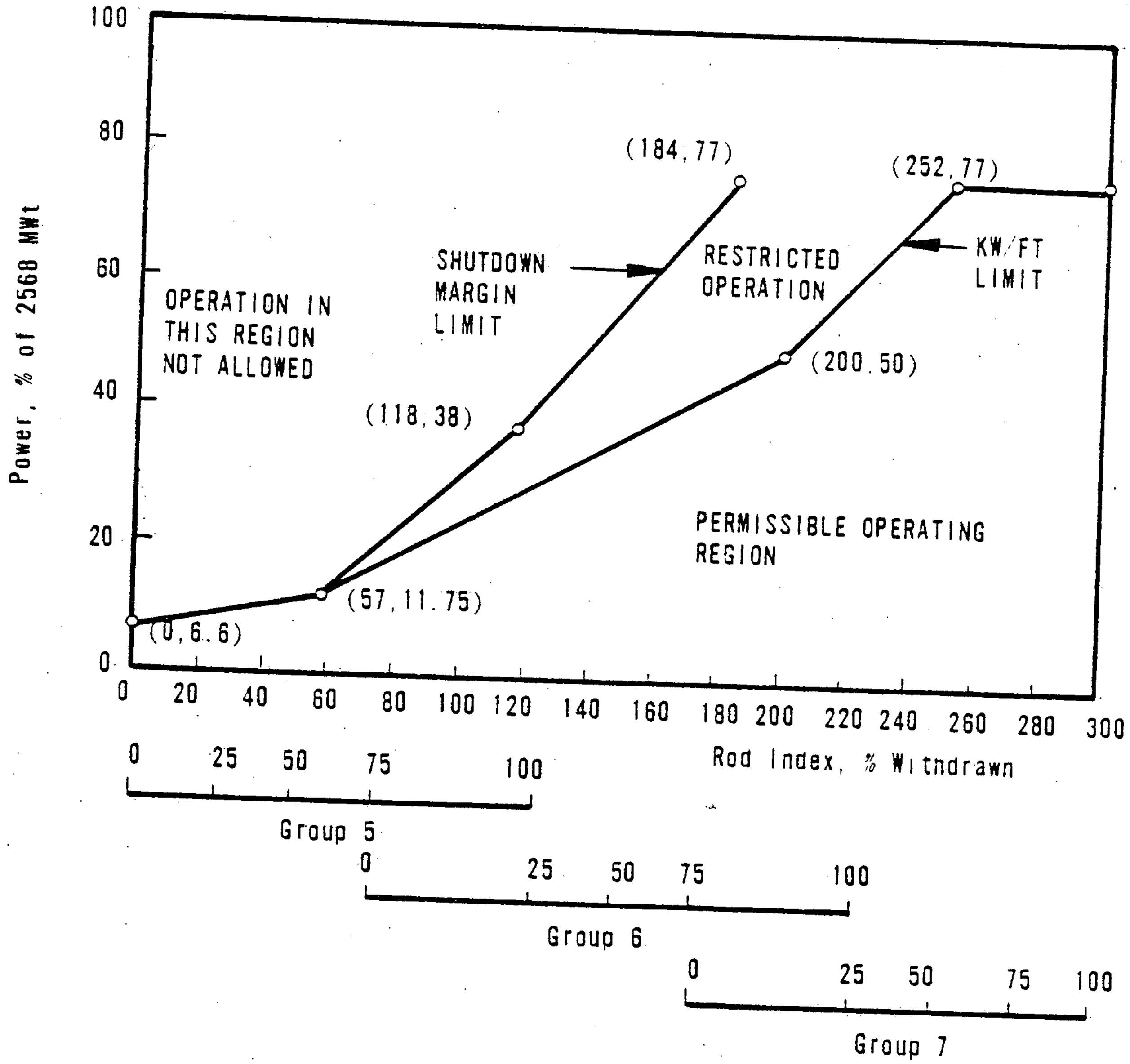
FIGURE 3.5.2-1B2



ROD POSITION LIMITS
FOR FOUR PUMP OPERATION
AFTER 225 ±10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-1B3



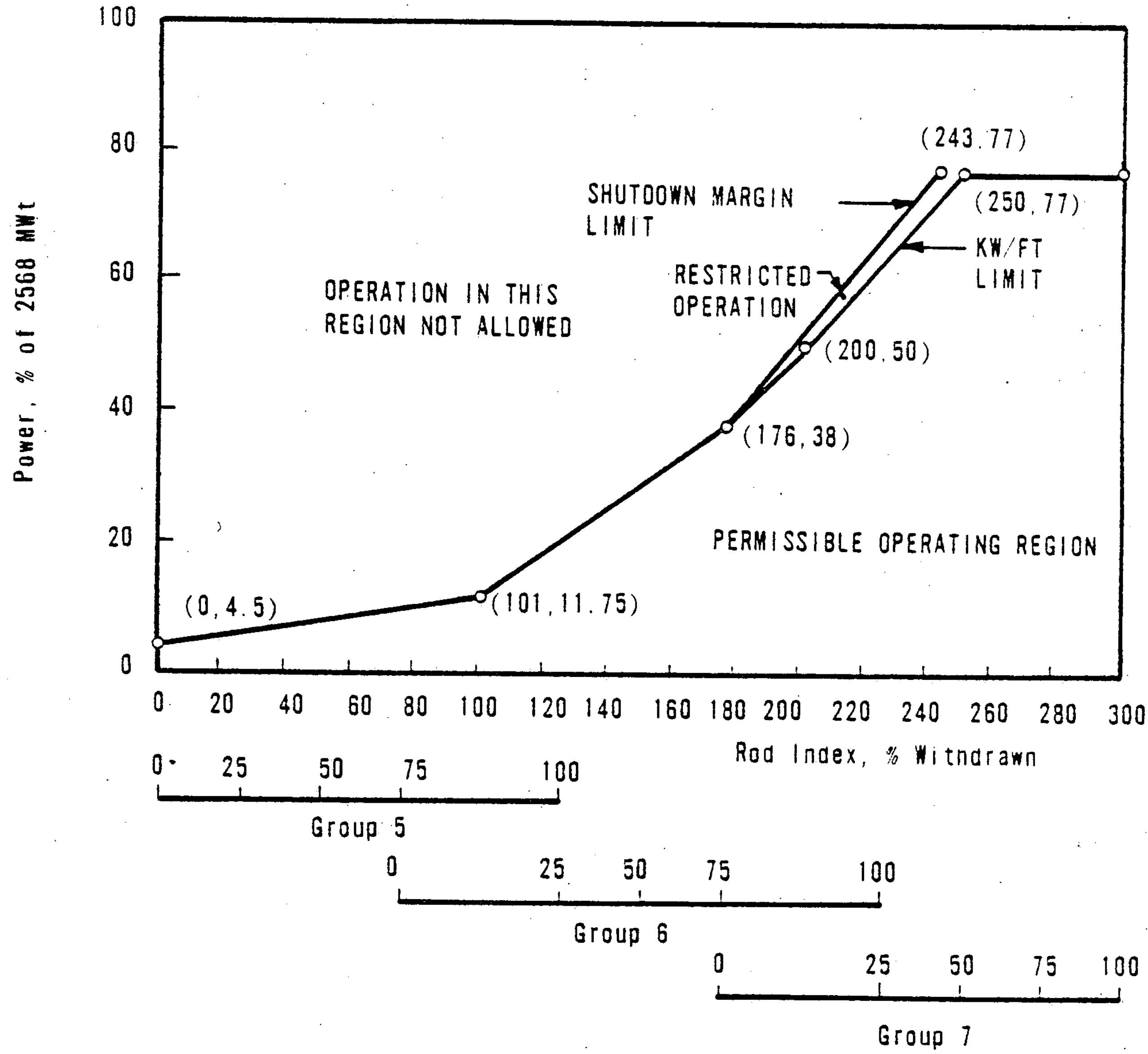
ROD POSITION LIMITS
FOR THREE PUMP OPERATION
FROM 0 to 50 (+10, -0) EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-2B1



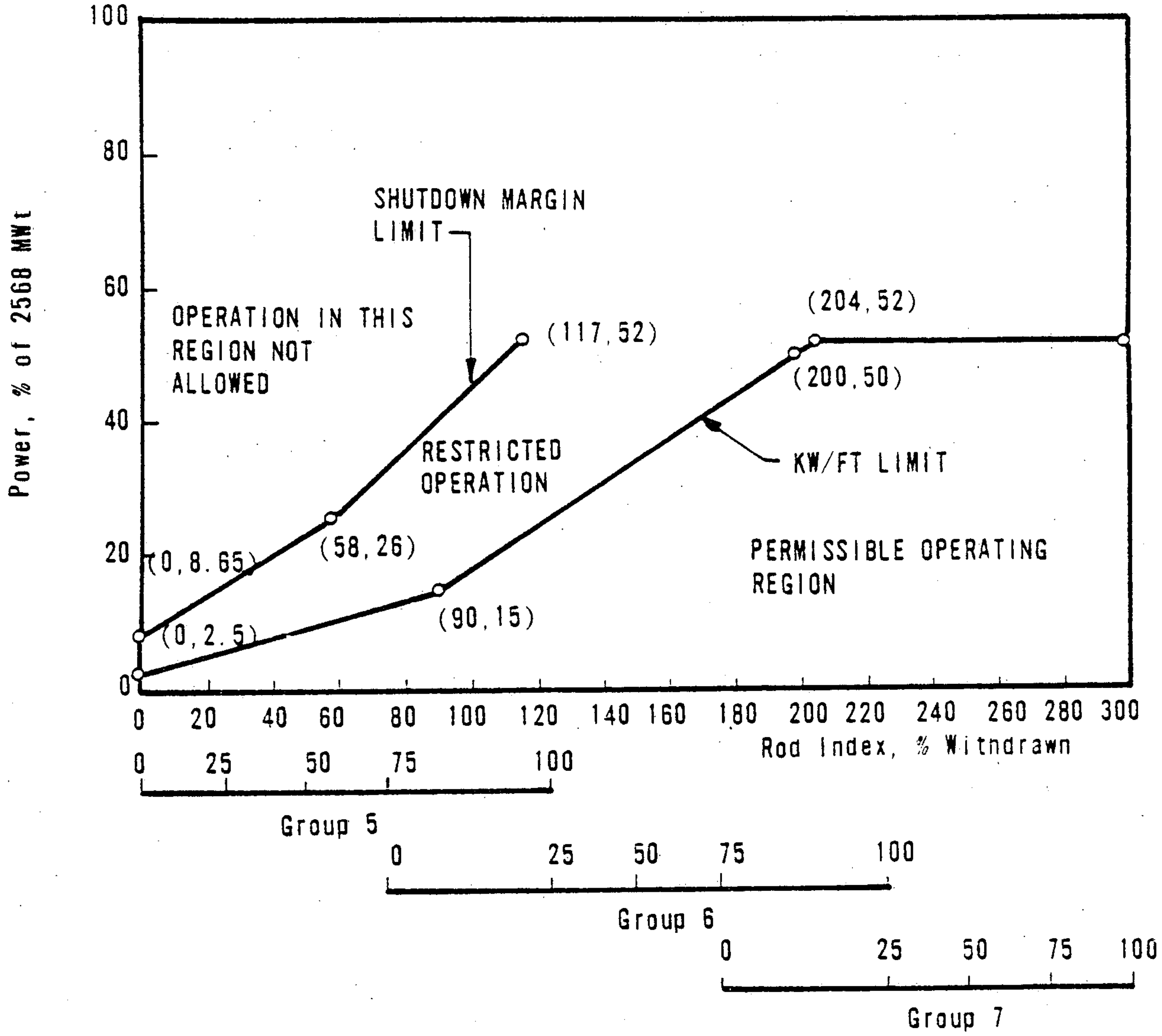
ROD POSITION LIMITS
FOR THREE PUMP OPERATION
FROM 50 (+10, -0) to 225 ±10 EFPD
UNIT 2

OCONEE NUCLEAR STATION

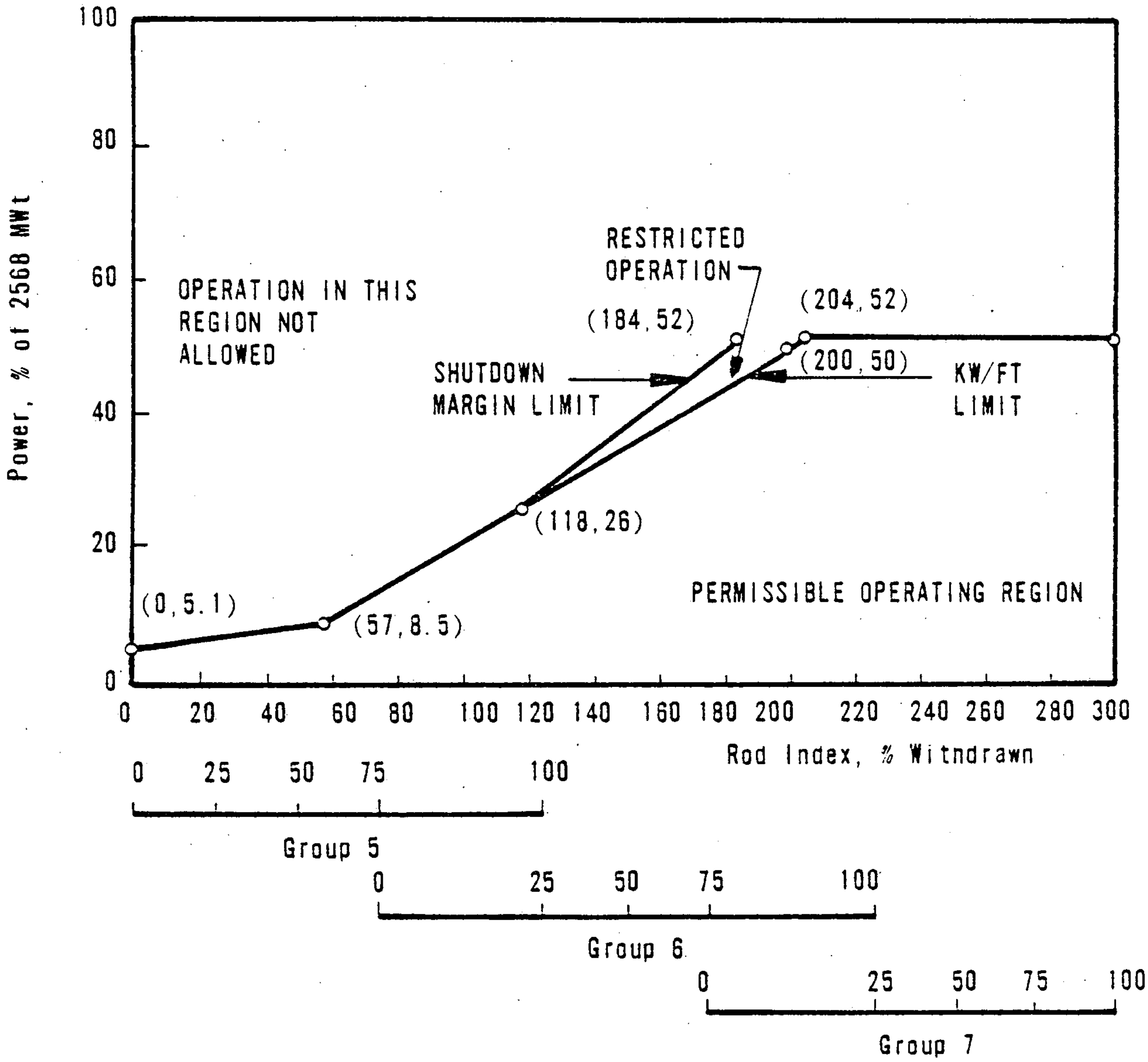
FIGURE 3.5.2-2B2



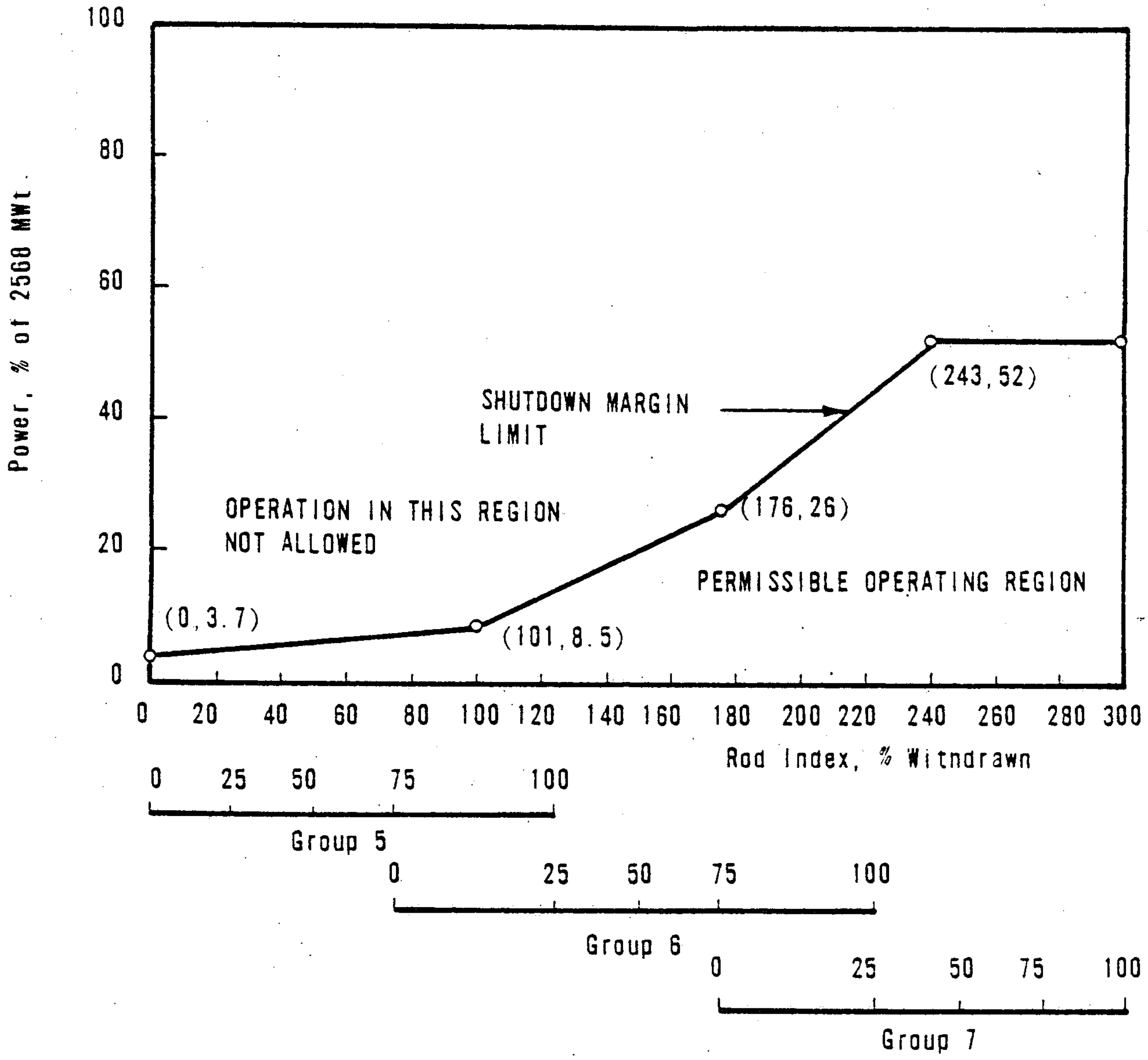
ROD POSITION LIMITS
FOR THREE PUMP OPERATION
AFTER 225 $\pm$10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-2B3



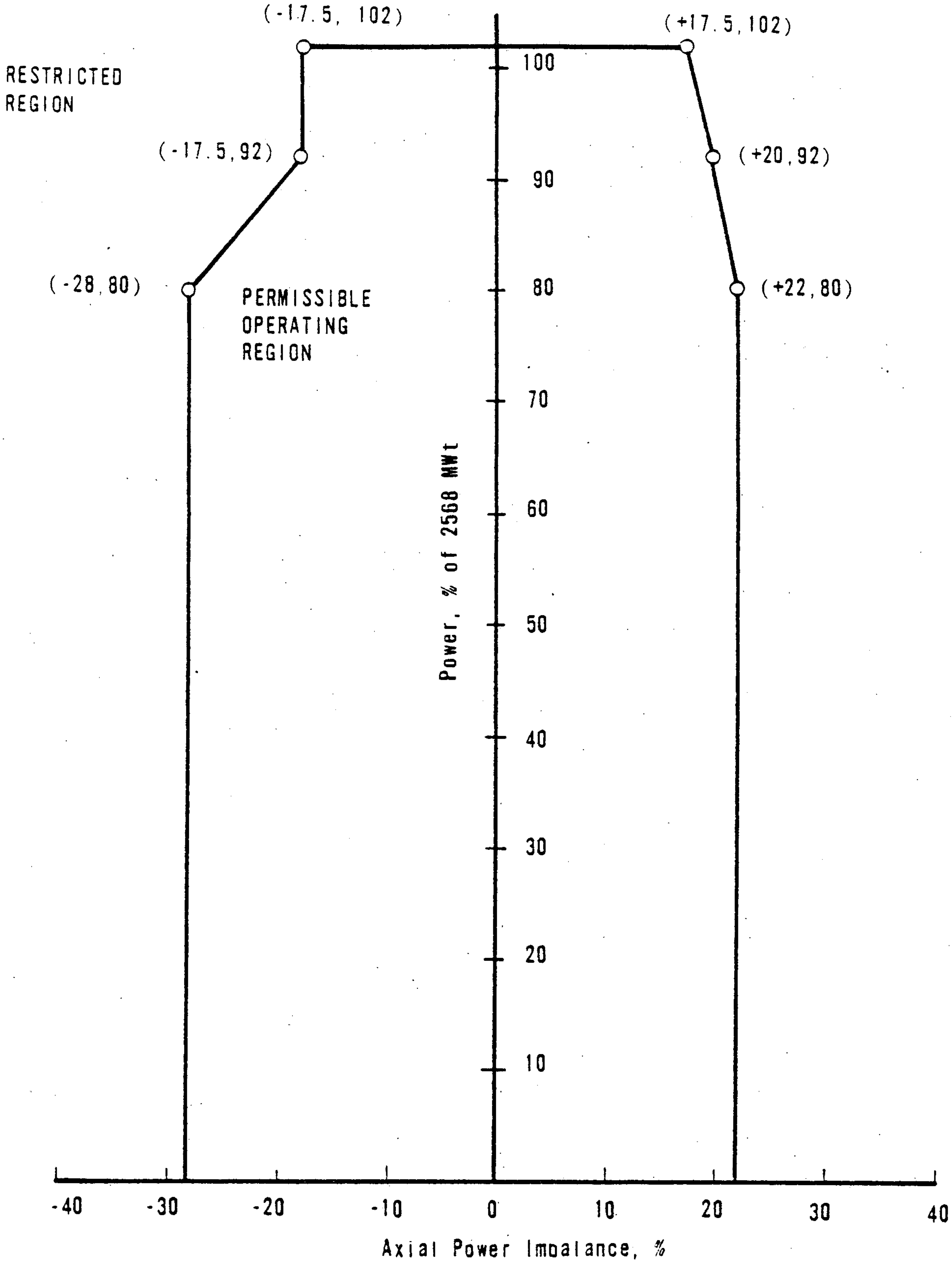
ROD POSITION LIMITS
FOR TWO PUMP OPERATION
FROM 0 to 50 (+10, -0) EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-2B4



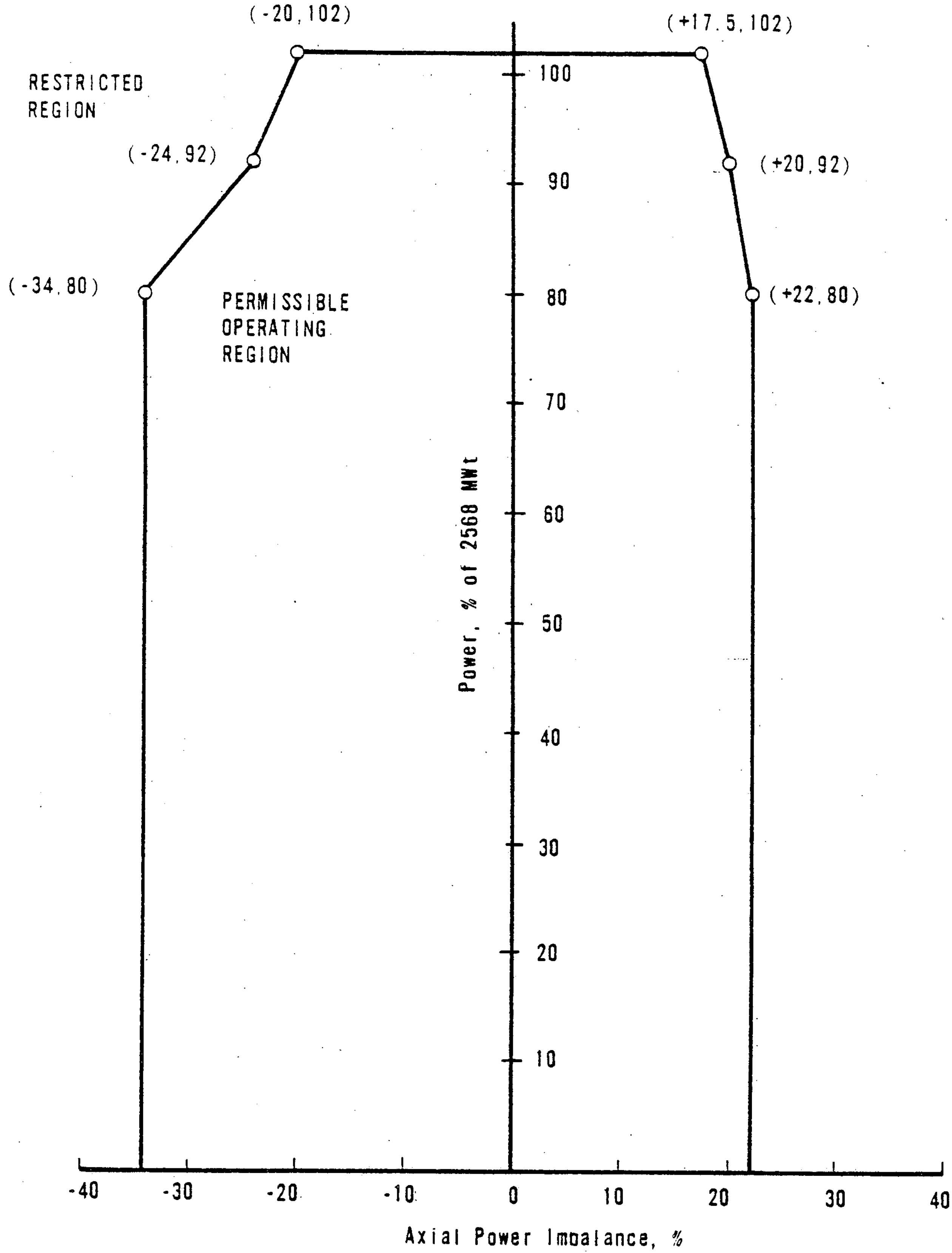
ROD POSITION LIMITS
FOR TWO PUMP OPERATION
FROM 50 (+10, -0) to 225 ±10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-2B5



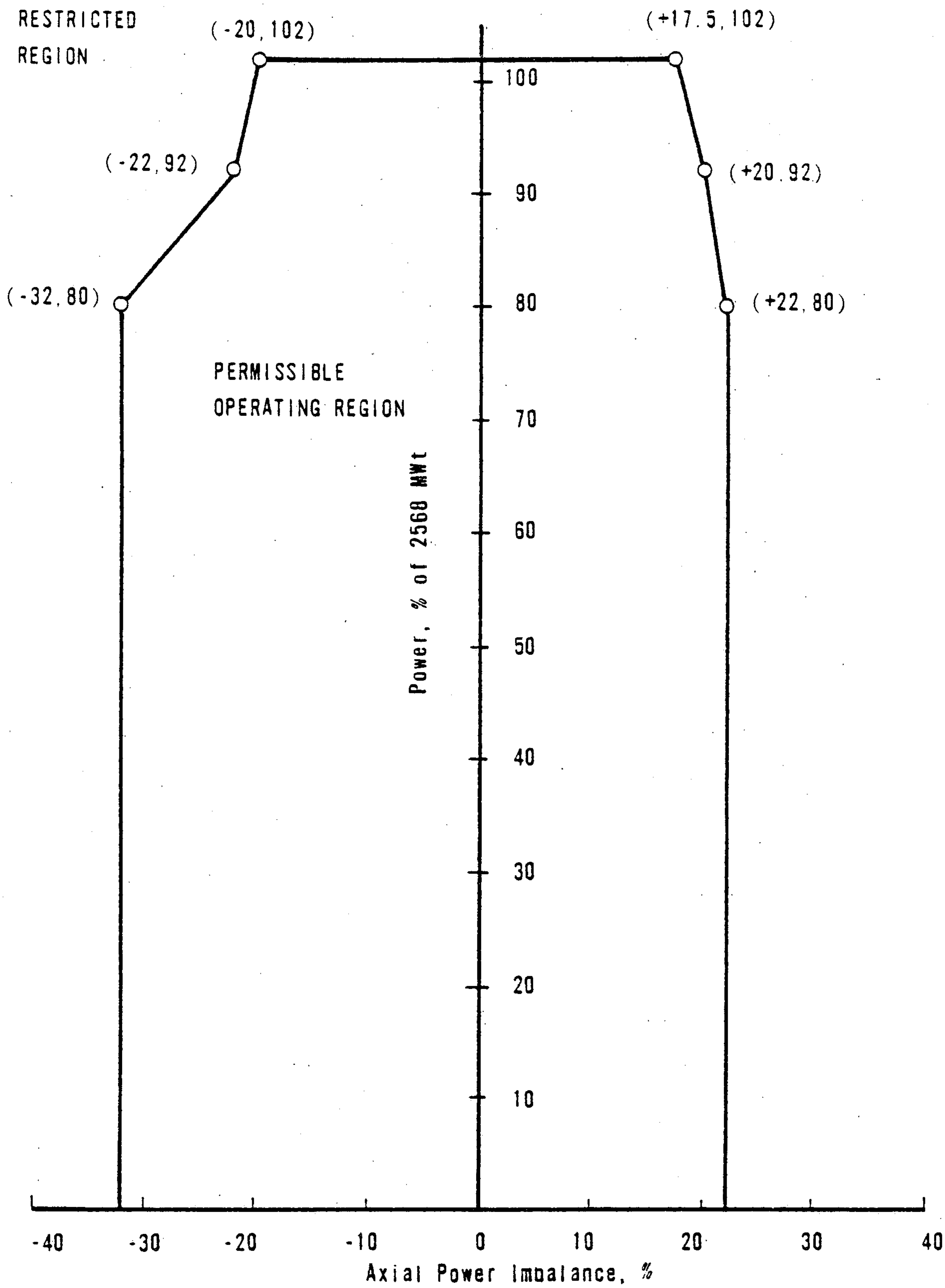
ROD POSITION LIMITS
FOR TWO PUMP OPERATION
AFTER 225 ±10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-2B6



OPERATIONAL POWER IMBALANCE LIMITS
FOR OPERATION
FROM 0 to 50 (+10, -0) EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-3B1

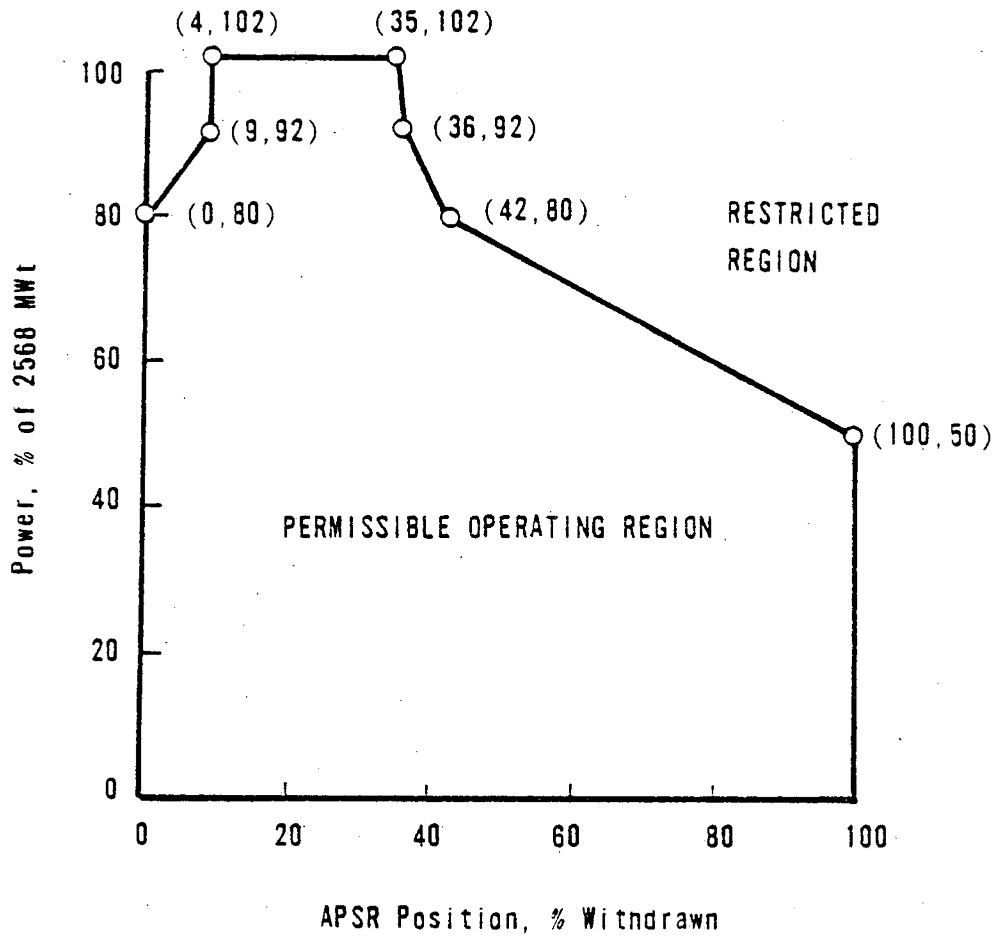


OPERATIONAL POWER IMBALANCE LIMITS
FOR OPERATION
FROM 50 (+10, -0) to 225 ±10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-3B2

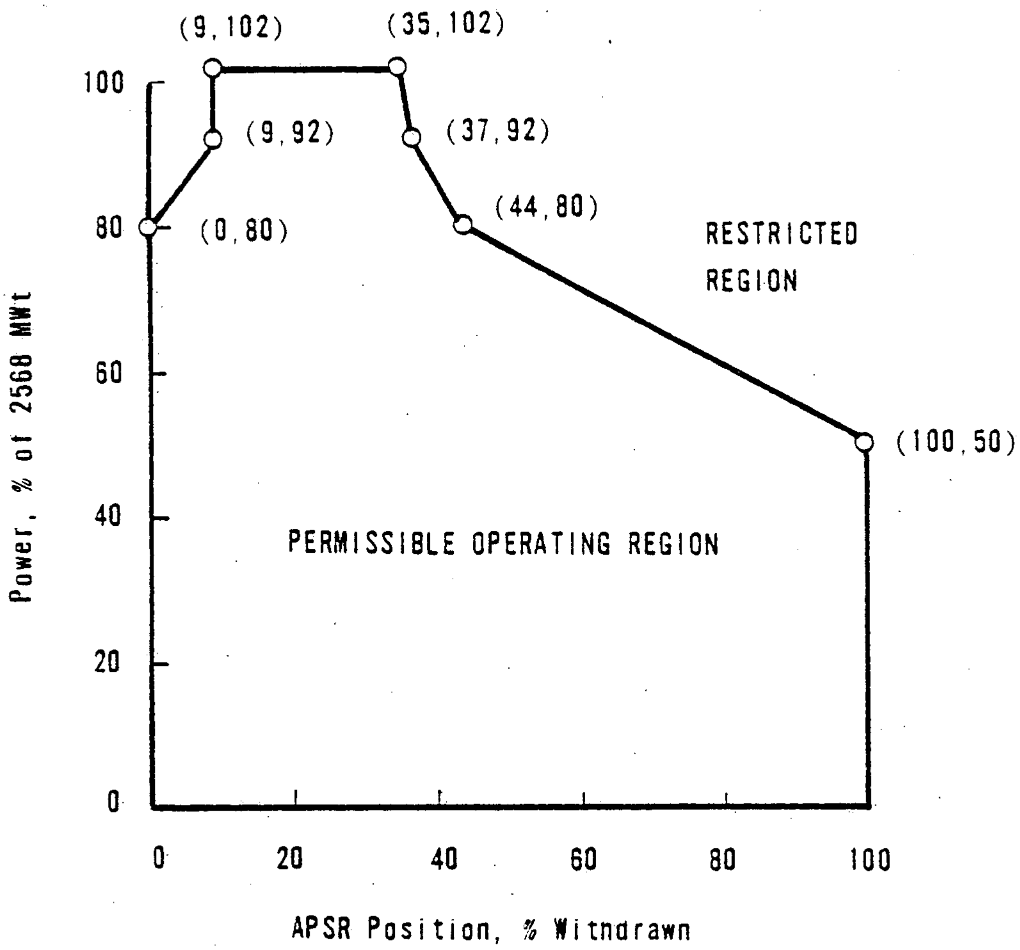


OPERATIONAL POWER IMBALANCE LIMITS
FOR OPERATION
AFTER 225 ±10 EFPD
UNIT 2

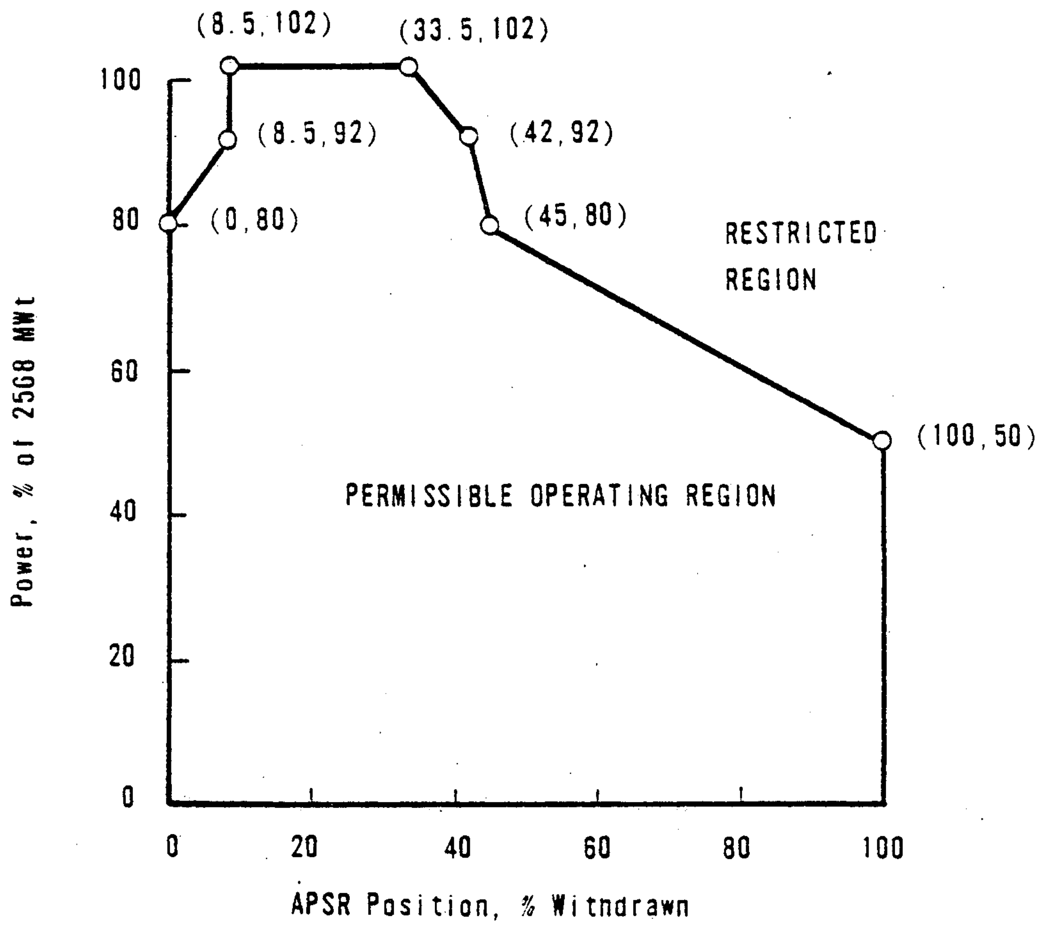
OCONEE NUCLEAR STATION
FIGURE 3.5.2-3B3



APSR POSITION LIMITS
FOR OPERATION
FROM 0 to 50 (+10, -0) EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-4B1



APSR POSITION LIMITS
FOR OPERATION
FROM 50 (+10, -0) to 225±10 EFPD
UNIT 2
OCONEE NUCLEAR STATION
FIGURE 3.5.2-4B2



APSR POSITION LIMITS
FOR OPERATION
AFTER 225 $\pm$ 10 EFPD
UNIT 2

OCONEE NUCLEAR STATION

FIGURE 3.5.2-4B3

ATTACHMENT 2

B&W Reload Report

Oconee 2, Cycle 6