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DESCRIPTION:

Ltr notaaized 5-9-75....trans the follow:

ENCLOSURES:

Amdt to OL/Change to Tech Specs: Consisting of revisions to the tech specs with regard to the regulating control rod positions....

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PLANT NAME: Oconee 1-3

FOR ACTION/INFORMATION 5-16-75 ehf

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DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28201

A. C. THIES
SENIOR VICE PRESIDENT
PRODUCTION AND TRANSMISSION

P. O. Box 2178

May 9, 1975

Mr. Angelo Giambusso, Director
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. Giambusso:

In response to the March 31, 1975 letter from Mr. Karl R. Goller, Duke Power Company submits the following proposed Technical Specification changes for the Oconee Nuclear Station.

The proposed revisions apply to Specifications 3.1.3.5, 3.5.2.3, and 3.5.2.5. The revision to Specification 3.1.3.5 incorporates an additional restriction on the regulating control rod positions prior to criticality to assure that the ejected rod worth does not exceed the 1.0% $\Delta k/k$ limit at hot zero power. The revision to Specification 3.5.2.3 deletes the specification on inserted control rod worths but at the same time specifies the manner in which the inserted control rod worths are to be maintained within acceptable limits. Finally, the revision to Specification 3.5.2.5 modifies the rod withdrawal limits for Oconee Units 2 and 3 after the control rod interchange.

The present specification on control rod withdrawal limits is intended to address only the LOCA-limited power peaking criterion. The shutdown margin and ejected rod worth criteria are independently specified by Specifications 3.5.2.1 and 3.5.2.3, respectively, and must be met in addition to the rod withdrawal limit specifications. Therefore, the present specifications are adequate, when used in conjunction with each other, as intended, to assure safe operation. However, in order to provide for a more direct application of the Technical Specifications, revised rod withdrawal limits have been proposed which will assure, by use of the rod withdrawal limits alone, compliance with the three subject criteria (LOCA-limited power peaking, shutdown margin, and ejected rod worth). In the case of Oconee 1, the current specification on the rod withdrawal limit continues to be adequate, since the ejected rod worth is predicted to be less than 1.0% $\Delta k/k$ following the rod interchange, for the rod withdrawal limits specified. (An analysis of the Oconee 1, Cycle 2 ejected rod worth has been submitted to the NRC in a letter of April 14, 1975, from Mr. A. C. Thies to Mr. Norman C. Moseley, with a copy sent to Mr. Angelo Giambusso.) For Oconee 2 and 3, revised rod withdrawal limits have been proposed since the hot zero power ejected rod worths after the control rod interchange have been predicted to exceed 1% $\Delta k/k$ for certain control positions allowed by the present Specification 3.5.2.5.

The proposed revision makes the specification on ejected rod worth redundant in that the rod position limits will now assure that the worth of a single inserted rod will not exceed the values verified to be acceptable in the safety analysis of the hypothetical rod ejection accident. It should be noted that Technical Specification 3.5.2.5c on rod position limits allows the rod position limits to be exceeded for a period of up to two hours on the basis that the LOCA has a very low probability of occurrence. We consider the probability of the rod ejection accident to be the same order as that of the LOCA; therefore, the same flexibility in the rod position limits should be allowed for the ejected rod worth criterion.

Attached are replacement pages 3.1-8, 3.1-9, 3.5-7, 3.5-8, 3.5-10, 3.5-11, 3.5-14, 3.5-14a, 3.5-15, 3.5-16, 3.5-16a, 3.5-17, 3.5-19, and 3.5-20 of the Oconee Nuclear Station Technical Specifications. The revisions are identified by vertical lines in the margin of the replacement pages.

To enable implementation of this revision prior to the Oconee Units 2 and 3 control rod interchange, it is requested that approval for this proposed revision be given as soon as possible.

Very truly yours,

A C Thies

A. C. Thies

ACT:vr
Attachments

Mr. Angelo Giambusso
Page 3
May 9, 1975

A. C. THIES, being duly sworn, states that he is Senior Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Atomic Energy Commission this request for amendment of the Oconee Nuclear Station Technical Specifications, Appendix A to Facility Operating Licenses DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

A C Thies

A. C. Thies, Senior Vice President

ATTEST:

John C. Goodman, Jr.

John C. Goodman, Jr.
Assistant Secretary

Subscribed and sworn to before me this 9th day of May, 1975.

Edna B. Farmer

Notary Public

My Commission Expires:

October 24, 1977

3.1.3 Minimum Conditions for Criticality

Specification

3.1.3.1 The reactor coolant temperature shall be above 525°F except for portions of low power physics testing when the requirements of Specification 3.1.9 shall apply.

3.1.3.2 Reactor coolant temperature shall be above DTT + 10°F.

3.1.3.3 When the reactor coolant temperature is below the minimum temperature specified in 3.1.3.1 above, except for portions of low power physics testing when the requirements of Specification 3.1.9 shall apply, the reactor shall be subcritical by an amount equal to or greater than the calculated reactivity insertion due to depressurization.

3.1.3.4 The reactor shall be maintained subcritical by at least 1%Δk/k until a steam bubble is formed and a water level between 80 and 396 inches is established in the pressurizer.

3.1.3.5 Except for physics tests and as limited by 3.5.2.1, safety rod groups shall be fully withdrawn prior to any other reduction in shutdown margin by deboration or regulating rod withdrawal during the approach to criticality. The regulating rods shall then be positioned within their position limits defined by Specification 3.5.2.5 prior to deboration.

Bases

At the beginning of the initial fuel cycle, the moderator temperature coefficient is expected to be slightly positive at operating temperatures with the operating configuration of control rods.(1) Calculations show that above 525°F, the consequences are acceptable.

Since the moderator temperature coefficient at lower temperatures will be less negative or more positive than at operating temperature,(2) startup and operation of the reactor when reactor coolant temperature is less than 525°F is prohibited except where necessary for low power physics tests.

The potential reactivity insertion due to the moderator pressure coefficient(2) that could result from depressurizing the coolant from 2100 psia to saturation pressure of 900 psia is approximately 0.1%Δk/k.

During physics tests, special operating precautions will be taken. In addition, the strong negative Doppler coefficient(1) and the small integrated Δk/k would limit the magnitude of a power excursion resulting from a reduction of moderator density.

The requirement that the reactor is not to be made critical below DTT + 10°F provides increased assurances that the proper relationship between primary coolant pressure and temperatures will be maintained relative to the NDTT of the primary coolant system. Heatup to this temperature will be accomplished by operating the reactor coolant pumps.

If the shutdown margin required by Specification 3.5.2 is maintained, there is no possibility of an accidental criticality as a result of a decrease of coolant pressure.

The requirement for pressurizer bubble formation and specified water level when the reactor is less than 1% subcritical will assure that the reactor coolant system cannot become solid in the event of a rod withdrawal accident of a start-up accident.[3]

The requirement that the safety rod groups be fully withdrawn before criticality ensures shutdown capability during startup. This does not prohibit rod latch confirmation, i.e., withdrawal by group to a maximum of 3 inches withdrawn of all seven groups prior to safety rod withdrawal.

The requirement for regulating rods being within their rod position limits ensures that the shutdown margin and ejected rod criteria at hot zero power are not violated.

REFERENCES

(1) FSAR, Section 3

(2) FSAR, Section 3.2.2.1.4

(3) FSAR, Supplement 3, Answer 14.4.1

g. If within one (1) hour of determination of an inoperable rod, it is not determined that a $1\%\Delta k/k$ hot shutdown margin exists combining the worth of the inoperable rod with each of the other rods, the reactor shall be brought to the hot standby condition until this margin is established.

h. Following the determination of an inoperable rod, all rods shall be exercised within 24 hours and exercised weekly until the rod problem is solved.

i. If a control rod in the regulating or safety rod groups is declared inoperable, power shall be reduced to 60 percent of the thermal power allowable for the reactor coolant pump combination.

j. If a control rod in the regulating or axial power shaping groups is declared inoperable, operation above 60 percent of rated power may continue provided the rods in the group are positioned such that the rod that was declared inoperable is maintained within allowable group average position limits of Specification 3.5.2.2.a and the withdrawal limits of Specification 3.5.2.5.c.

3.5.2.3 The worths of single inserted control rods during criticality are limited by the restrictions of Specification 3.1.3.5 and the control rod position imits defined in Specification 3.5.2.5.

3.5.2.4 Quadrant Power Tilt

a. Whenever the quadrant power tilt exceeds 4 percent, except for physics tests, the quadrant tilt shall be reduced to less than 4 percent within two hours or the following actions shall be taken:

(1) If four reactor coolant pumps are in operation, the allowable thermal power shall be reduced by 2 percent of full power for each 1 percent tilt in excess of 4 percent below the power level cutoff (see Figures 3.5.2-1A1, 3.5.2-1B1, 3.5.2-1B2, 3.5.2-1B3, 3.5.2-1C1, 3.5.2-1C2, and 3.5.2-1C3).

(2) If less than four reactor coolant pumps are in operation, the allowable thermal power shall be reduced by 2 percent of full power for each 1 percent tilt below the power allowable for the reactor coolant pump combination as defined by Specification 2.3.

(3) Except as provided in 3.5.2.4.b, the reactor shall be brought to the hot shutdown condition within four hours if the quadrant tilt is not reduced to less than 4 percent after 24 hours.

b. If the quadrant tilt exceeds 4 percent and there is simultaneous indication of a misaligned control rod per Specification 3.5.2.2, reactor operation may continue provided power is reduced to 60 percent of the thermal power allowable for the reactor coolant pump combination.

c. Except for physics tests, if quadrant tilt exceeds 9 percent, a controlled shutdown shall be initiated immediately and the reactor shall be brought to the hot shutdown condition within four hours.

d. Whenever the reactor is brought to hot shutdown pursuant to 3.5.2.4.a(3) or 3.5.2.4.c above, subsequent reactor operation is permitted for the purpose of measurement, testing, and corrective action provided the thermal power and the power range high flux setpoint allowable for the reactor coolant pump combination are restricted by a reduction of 2 percent of full power for each 1 percent tilt for the maximum tilt observed prior to shutdown.

e. Quadrant power tilt shall be monitored on a minimum frequency of once every two hours during power operation above 15 percent of rated 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. Operating rod group overlap shall be 25% ± 5% between two sequential groups, except for physics tests.

c. Except for physics tests or exercising control rods, the control rod withdrawal limits* are specified on Figures 3.5.2-1A1 (Unit 1), 3.5.2-1B1, 3.5.2-1B2 and 3.5.2-1B3 (Unit 2), and 3.5.2-1C1, 3.5.2-1C2, and 3.5.2-1C3 (Unit 3) for four pump operation and on Figures 3.5.2-2A (Unit 1), 3.5.2-2B (Unit 2), and 3.5.2-2C (Unit 3) for three or two pump operation. If the control rod position limits are exceeded, corrective measures shall be taken immediately to achieve an acceptable control rod position. Acceptable control rod positions shall then be attained within two hours.

d. Except for physics tests, power shall not be increased above the power level cutoff as shown on Figures 3.5.2-1A1 (Unit 1) [see additional operating restrictions for Unit 1]* 3.5.2-1B1, 3.5.2-1B2, and 3.5.2-1B3 (Unit 2), and 3.5.2-1C1, 3.5.2-1C2, 3.5.2-1C3 (Unit 3), unless the following requirements are met.

(1) The xenon reactivity shall be within 10 percent of the value for operation at steady-state rated power.

(2) The xenon reactivity shall be asymptotically approaching the value for operation at steady-state rated power.

Bases

The power-imbalance envelope defined in Figures 3.5.2-3A, 3.5.2-3B, and 3.5.2-3C is based on LOCA analyses which have defined the maximum linear heat rate (see Figure 3.5.2-4) such that the maximum clad temperature will not exceed the Final Acceptance Criteria. Corrective measures will be taken immediately should the indicated quadrant tilt, rod position, or imbalance be outside their specified boundary. Operation in a situation that would cause the Final acceptance criteria to be approached should a LOCA occur is highly improbable because all of the power distribution parameters (quadrant tilt, rod position, and imbalance) must be at their limits while simultaneously all other engineering and uncertainty factors are also at their limits.** Conservatism is introduced by application of:

a. Nuclear uncertainty factors
b. Thermal calibration
c. Fuel densification effects
d. Hot rod manufacturing tolerance factors

The 25% ± 5% overlap between successive control rod groups is allowed since the worth of a rod is lower at the upper and lower part of the stroke. Control rods are arranged in groups or banks defined as follows:

Group	Function
1	Safety
2	Safety
3	Safety
4	Safety
5	Regulating
6	Regulating
7	Xenon transient override
8	APSR (axial power shaping bank)

The rod position limits are based on the most limiting of the following three criteria: ECCS power peaking, shutdown margin, and potential ejected rod worth. Therefore, compliance with the ECCS power peaking criterion is ensured by the rod position limits. The minimum available rod worth, consistant with the rod position limits, provides for achieving hot shutdown by reactor trip at any time, assuming the highest worth control rod that is withdrawn remains in the full out position (1). The rod position limits also ensure that inserted rod groups will not contain single rod worths greater than 0.5% $\Delta k/k$ (unit 1) or 0.65% $\Delta k/k$ (units 2 and 3) at rated power. These values have been shown to be safe by the safety analysis (2,3,4) of the hypothetical rod ejection accident. A maximum single inserted control rod worth of 1.0% $\Delta k/k$ is allowed by the rod positions limits at hot zero power. A single inserted control rod worth of 1.0% $\Delta k/k$ at beginning-of-life, hot zero power would result in a lower transient peak thermal power and, therefore, less severe environmental consequences than a 0.5% $\Delta k/k$ (unit 1) or 0.65% $\Delta k/k$ (units 2 and 3) ejected rod worth at rated power.

Control rod groups are withdrawn in sequence beginning with Group 1. Groups 5,6, and 7 are overlapped 25 percent. The normal position at power is for Groups 6 and 7 to be partially inserted.

**Actual operating limits depend on whether or not incore or excore detectors are used and their respective instrument and calibration errors. The method used to define the operating limits is defined in plant operating procedures.

The quadrant power tilt limits set forth in Specification 3.5.2.4 have been established within the thermal analysis design base using the definition of quadrant power tilt given in Technical Specifications, Section 1.6. These limits in conjunction with the control rod position limits in Specification 3.5.2.5c ensure that design peak heat rate criteria are not exceeded during normal operation when including the effects of potential fuel densification.

The quadrant tilt and axial imbalance monitoring in Specifications 3.5.2.4 and 3.5.2.6, respectively, normally will be performed in the process computer. The two-hour frequency for monitoring these quantities will provide adequate surveillance when the computer is out of service.

Allowance is provided for withdrawal limits and reactor power imbalance limits to be exceeded for a period of two hours without specification violation. Acceptance rod positions and imbalance must be achieved within the two-hour time period or appropriate action such as a reduction of power taken.

Operating restrictions are included in Technical Specification 3.5.2.5d to prevent excessive power peaking by transient xenon. The xenon reactivity must be beyond the "undershoot" region and asymptotically approaching its equilibrium value at rated power.

REFERENCES

[1]FSAR Section 3.2.2.1.2

[2]FSAR Section 14.2.2.2

[3]FSAR SUPPLEMENT 9

[4]B&W FUEL DENSIFICATION REPORT

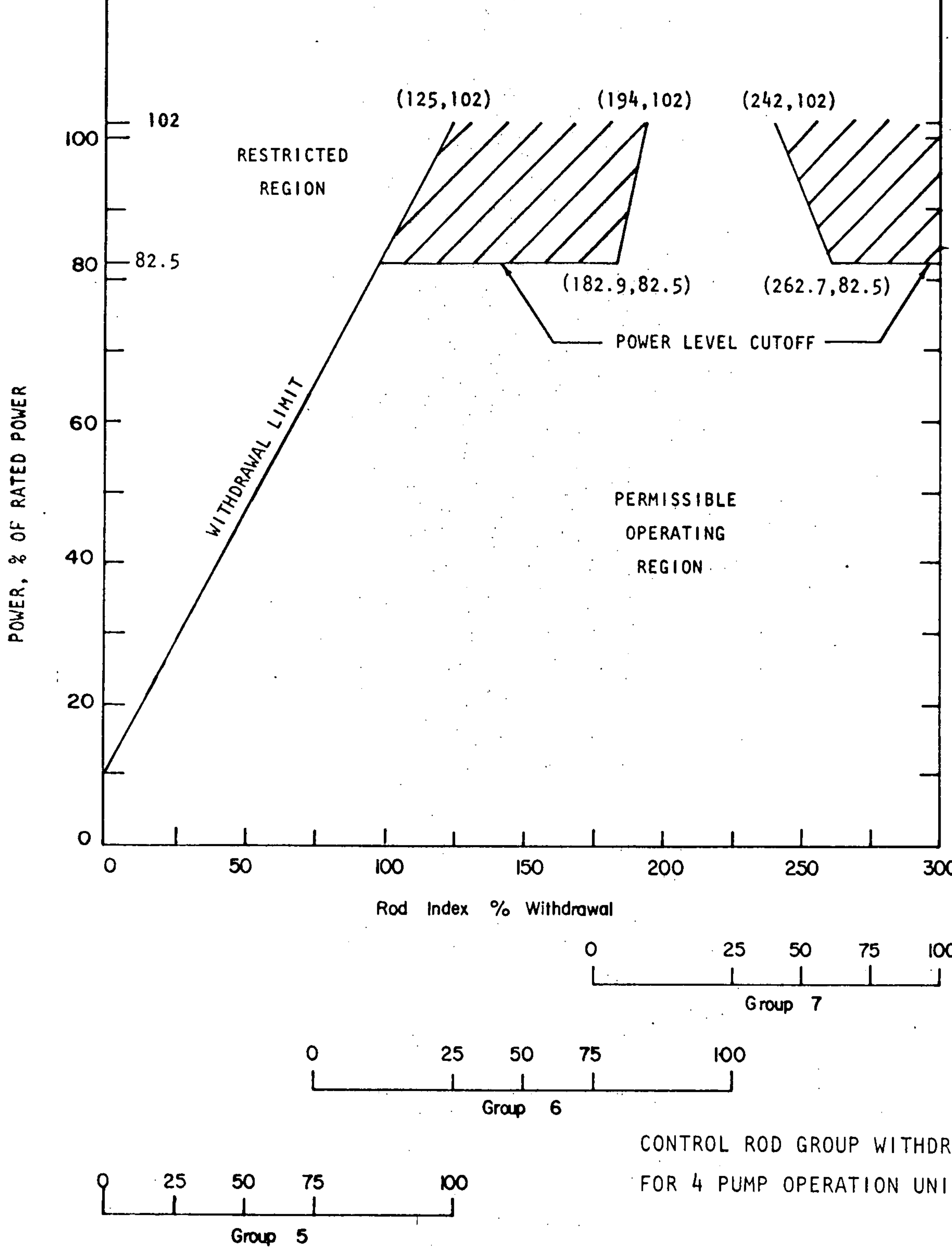
BAW-1409 (UNIT 1)

BAW-1396 (UNIT 2)

BAW-1400 (UNIT 3)

1. ROD INDEX IS THE PERCENTAGE SUM OF THE WITHDRAWAL OF THE

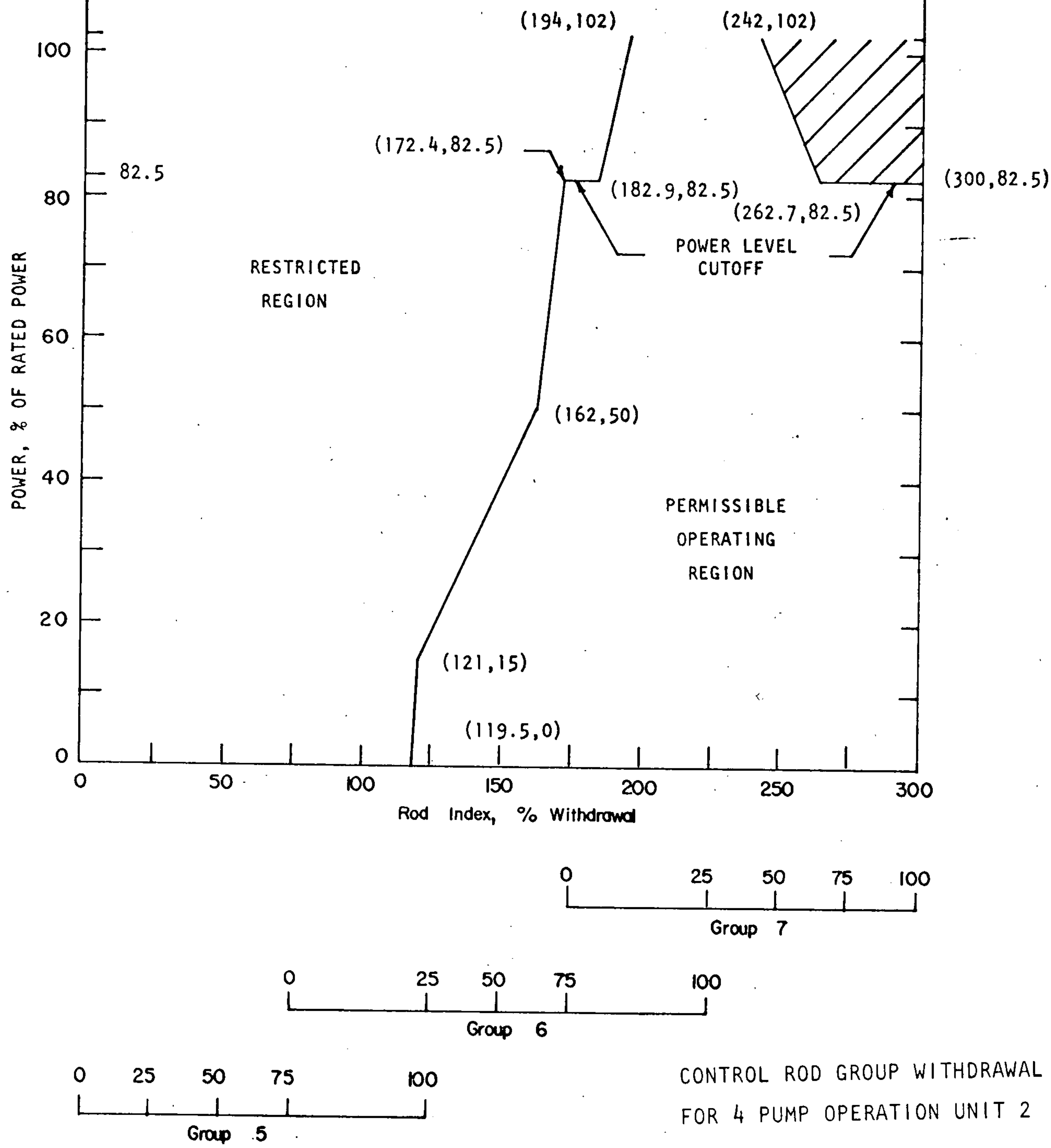
2. RESTRICTIONS ON WITHDRAWAL (HASHED AREAS) ARE MODIFIED AFTER THE CONTROL ROD INTERCHANGE (SEE FIGURE 3.5.2-1B2)



CONTROL ROD GROUP WITHDRAWAL LIMITS FOR 4 PUMP OPERATION UNIT 2

UNIT 2
OCONEE NUCLEAR STATION
Figure 3.5.2-1B1

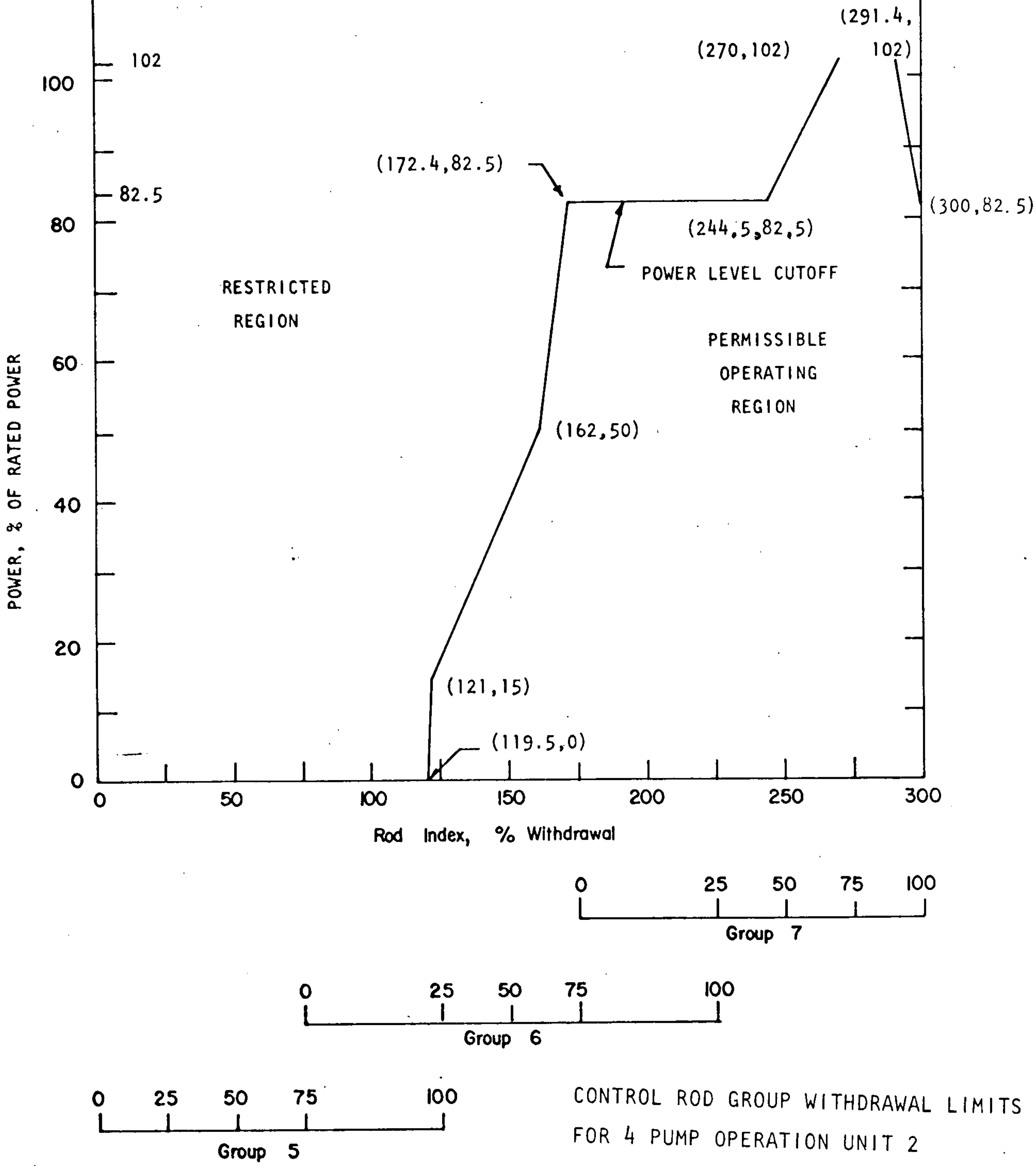
1. ROD INDEX IS THE PERCENTAGE SUM OF THE WITHDRAWAL OF THE OPERATING GROUPS.
2. THE ADDITIONAL RESTRICTIONS ON WITHDRAWAL (HASHED AREAS) ARE IN EFFECT AFTER THE CONTROL ROD INTERCHANGE. THE RESTRICTIONS ON WITHDRAWAL ARE FURTHER MODIFIED AFTER 435 FULL POWER DAYS OF OPERATION (SEE FIGURE 3.5.2-1B3)



CONTROL ROD GROUP WITHDRAWAL LIMITS FOR 4 PUMP OPERATION UNIT 2

UNIT 2
OCONEE NUCLEAR STATION
Figure 3.5.2-1B2

1. ROD INDEX IS THE PERCENTAGE SUM OF THE WITHDRAWAL OF THE OPERATING GROUPS.
2. THE ADDITIONAL RESTRICTIONS ON WITHDRAWAL ARE IN EFFECT AFTER 435 FULL POWER DAYS OF OPERATION.



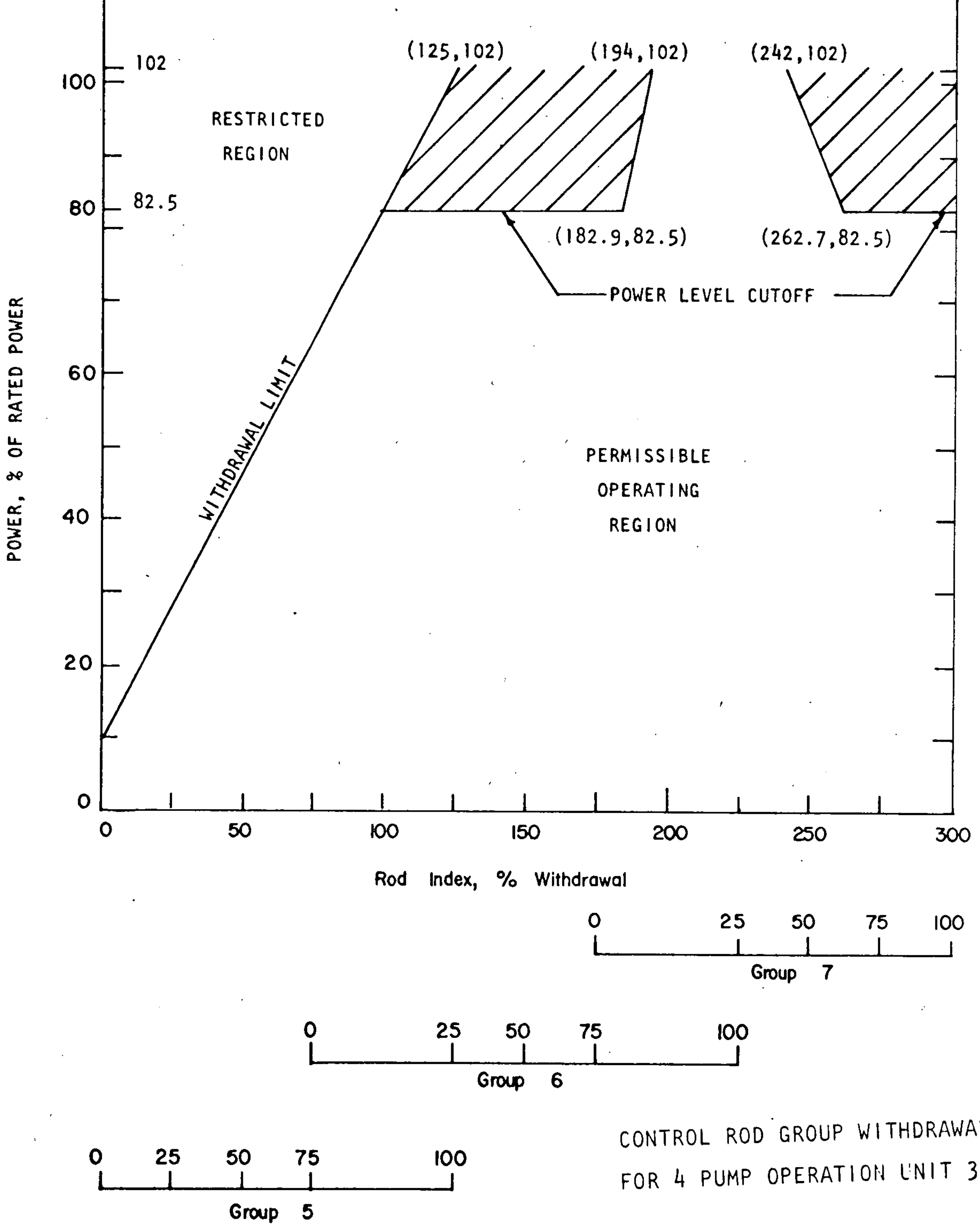
CONTROL ROD GROUP WITHDRAWAL LIMITS FOR 4 PUMP OPERATION UNIT 2

UNIT 2

OCONEE NUCLEAR STATION

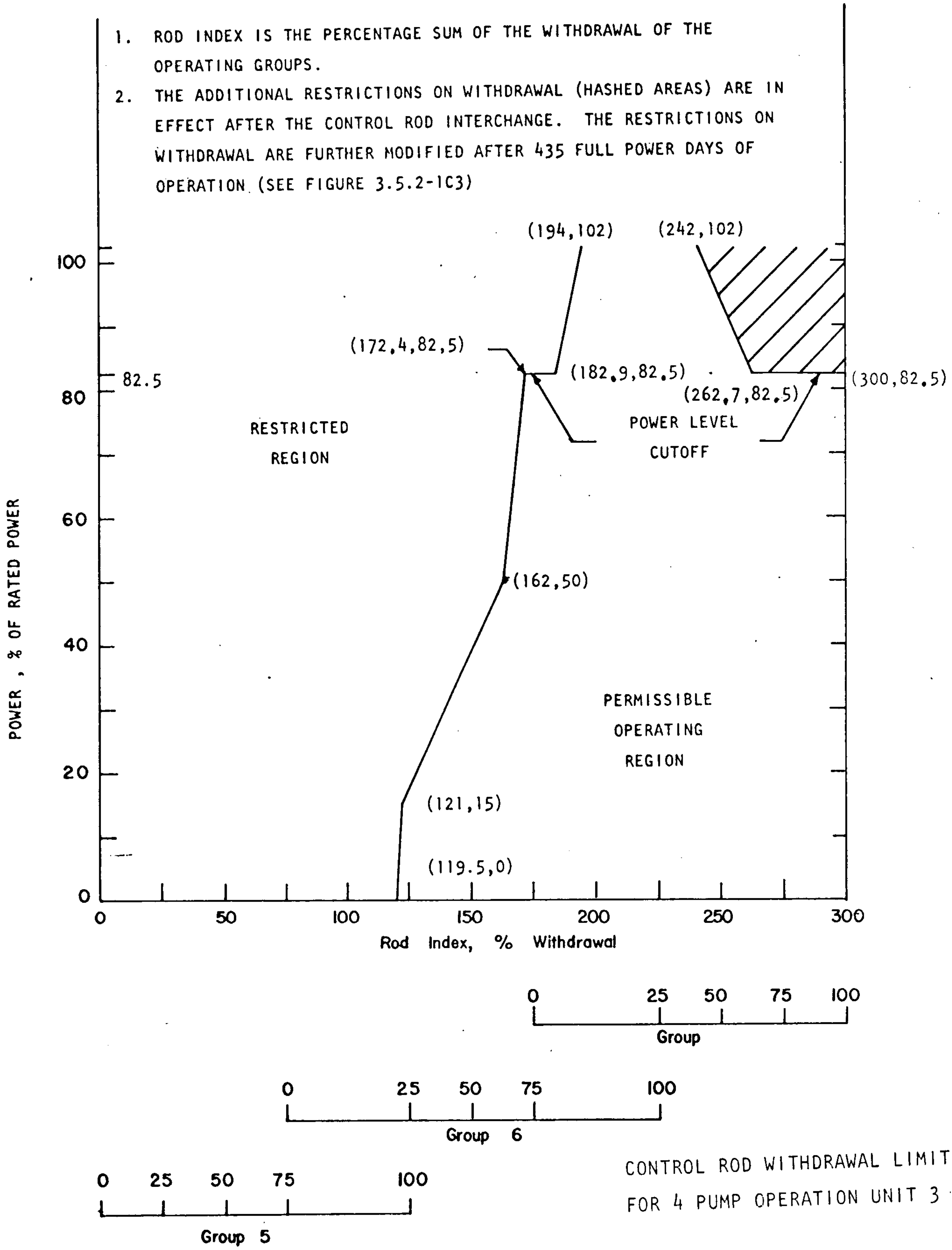
Figure 3.5.2-1B3

1. ROD INDEX IS THE PERCENTAGE SUM OF THE WITHDRAWAL OF THE OPERATING GROUPS.
2. RESTRICTIONS ON WITHDRAWAL (HASHED AREAS) ARE MODIFIED AFTER THE CONTROL ROD INTERCHANGE (SEE FIGURE 3.5.2-1C2)



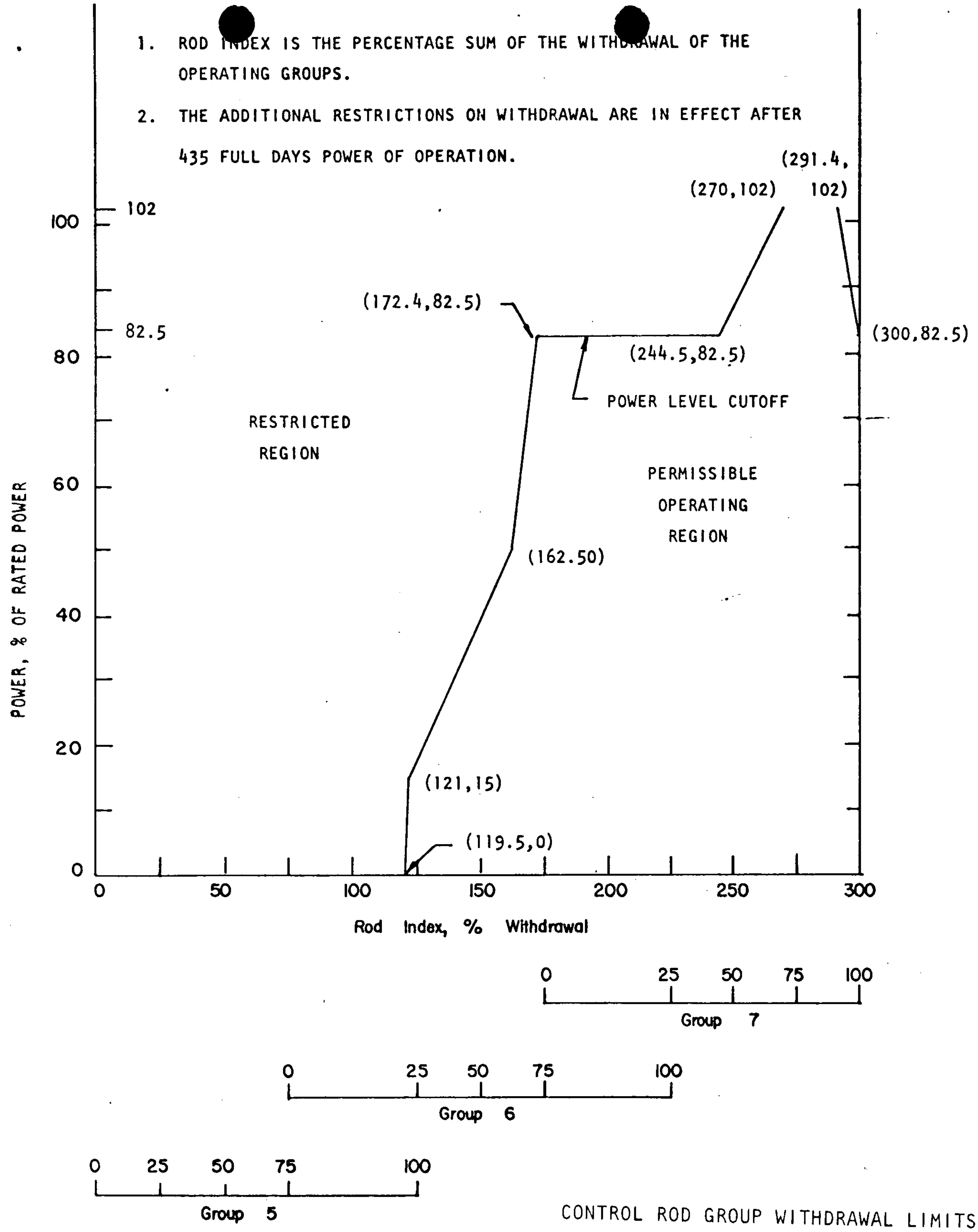
CONTROL ROD GROUP WITHDRAWAL LIMITS
FOR 4 PUMP OPERATION UNIT 3

UNIT 3
OCONEE NUCLEAR STATION
Figure 3.5.2-1C1



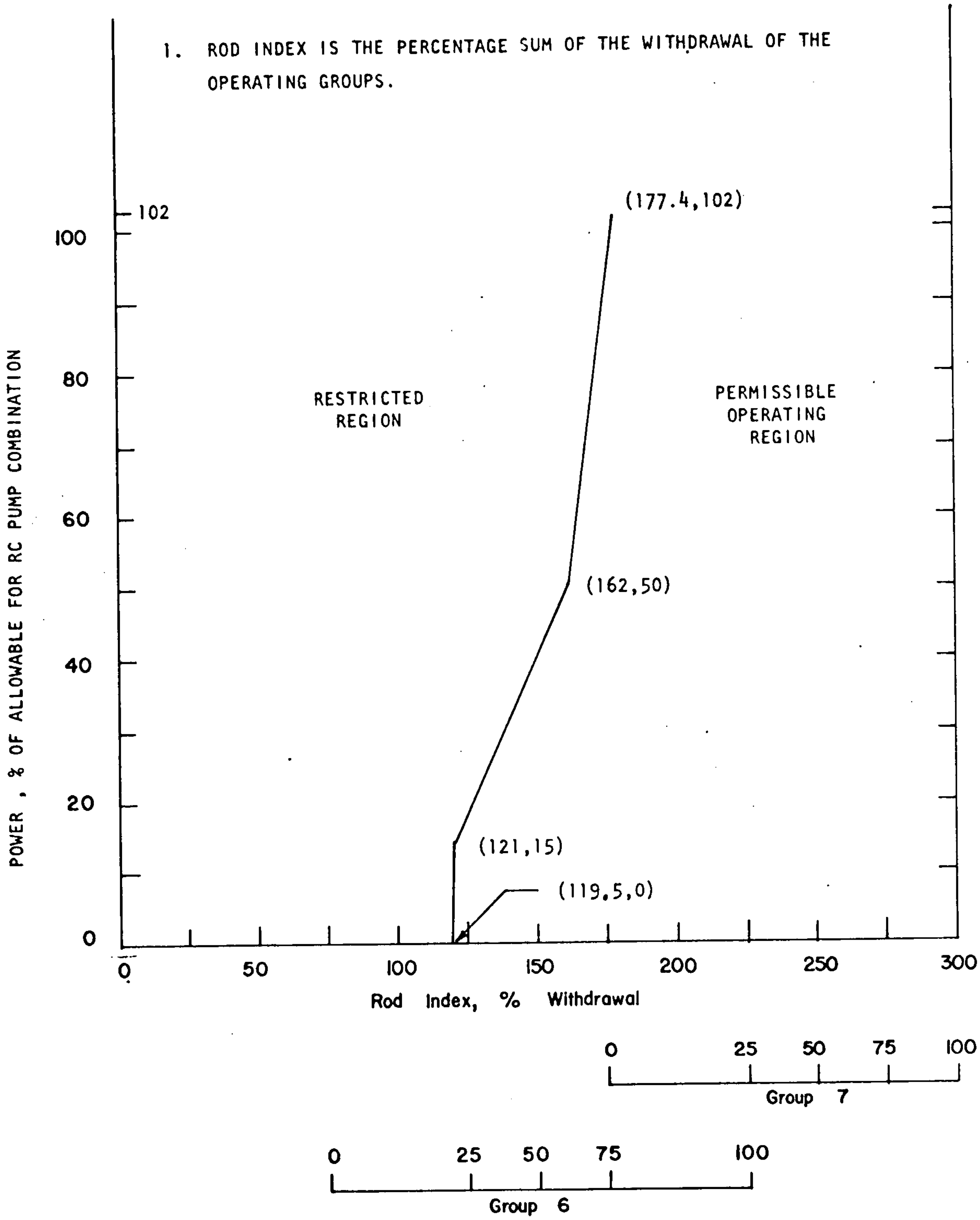
CONTROL ROD WITHDRAWAL LIMITS FOR 4 PUMP OPERATION UNIT 3

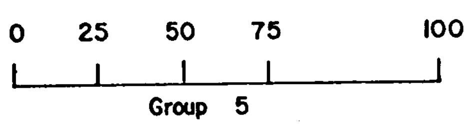
UNIT 3
OCONEE NUCLEAR STATION
Figure 3.5.2-1C2



CONTROL ROD GROUP WITHDRAWAL LIMITS FOR 4 PUMP OPERATION UNIT 3

UNIT 3
OCONEE NUCLEAR STATION
Figure 3.5.2-1C3

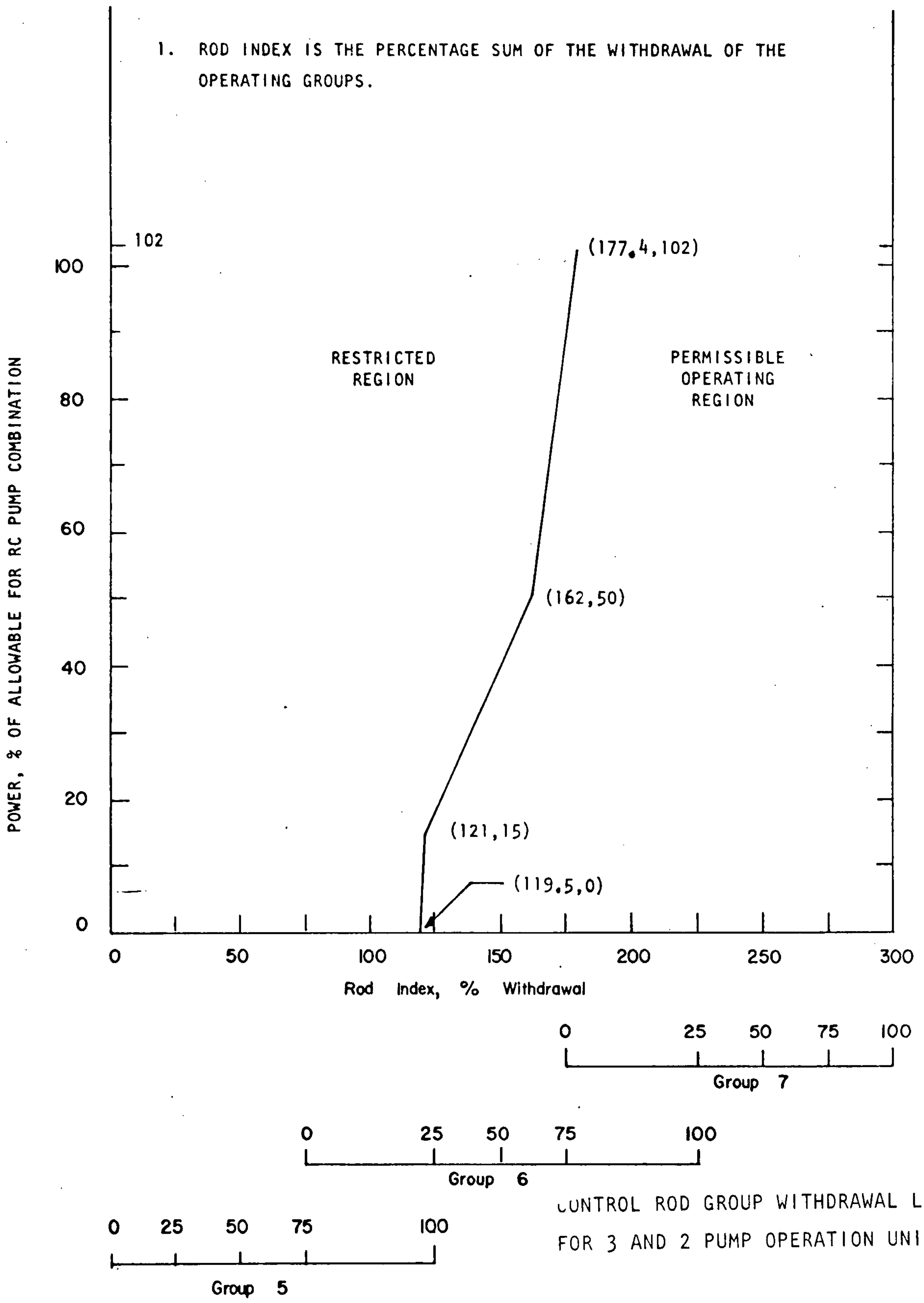




ONTROL ROD GROUP WITHDRAWAL LIMITS
FOR 3 AND 2 PUMP OPERATION UNIT 2

UNIT 2
OCONEE NUCLEAR STATION
Figure 3.5.2-2B

1. ROD INDEX IS THE PERCENTAGE SUM OF THE WITHDRAWAL OF THE OPERATING GROUPS.



CONTROL ROD GROUP WITHDRAWAL LIMITS FOR 3 AND 2 PUMP OPERATION UNIT 3

UNIT 3
OCONEE NUCLEAR STATION
Figure 3.5.2-2C