5.3 REACTOR

Specification

POOR ORIGINAL

5.3.1 Reactor Core

5.3.1.1 The reactor core contains approximately 93.1 metric tons of slightly enriched uranium dioxide pellets. The pellets are encapsulated in zircaloy-4 tubing to form fuel rods. The reactor core is made up of 177 fuel assemblies. Each fuel assembly contains 208 fuel rods. (1) (2)

5.3.1.2 The reactor core shall approximate a right circular cylinder with an equivalent diameter of 128.9 inches and an active height of 144 inches. (2)

5.3.1.3 The average enrichment of the initial core for Rancho Seco is a nominal 2.57 weight percent of U^{235}. Three fuel enrichments are used in the initial core. 65

5.3.1.4 There are 61 full-length control rod assemblies (CRA) and 8 axial power shaping rod assemblies (APSRA) distributed in the reactor core as shown in FSAR figure 3.2-45. The full-length CRA contain a 134 inch length of silver-indium-cadmium alloy clad with stainless steel. The APSRA contain a 36 inch length of silver-indium-cadmium alloy clad with stainless steel. (3)

5.3.1.5 The initial core will have 68 burnable poison assemblies with similar dimensions as the full-length control rods. The cladding will be zircaloy-4 filled with aluminum oxide-boron carbide pellets and placed in the core as shown in FSAR figure 3.2-2.

5.3.1.6 Reload fuel assemblies and rods shall conform to design and evaluation described in the FSAR and shall not exceed an equivalent enrichment of 3.2 weight percent of U^{235}. A reload core may also have burnable poison assemblies with dimensions similiar to the full length control rods with materials as specified in 5.3.1.5. 65

5.3.2 Reactor Coolant System

5.3.2.1 The reactor coolant system shall be designed and constructed in accordance with code requirements. (4)

5.3.2.2 The reactor coolant system and any connected auxiliary systems exposed to the reactor coolant conditions of temperature and pressure, shall be designed for a pressure of 2,500 psig and a temperature of 650°F. The pressurizer and pressurizer surge line shall be designed for a temperature of 670°F. (5)

5.3.2.3 The reactor coolant system volume shall be less than 12,200 cubic feet.

REFERENCES

(1) FSAR table 3.2-1

(2) FSAR table 3.2-2

(3) FSAR paragraph 3.2.4.2

(4) FSAR paragraph 4.1.3

(5) FSAR paragraph 4.1.2

(6) Cycle 4 Reload Report |65

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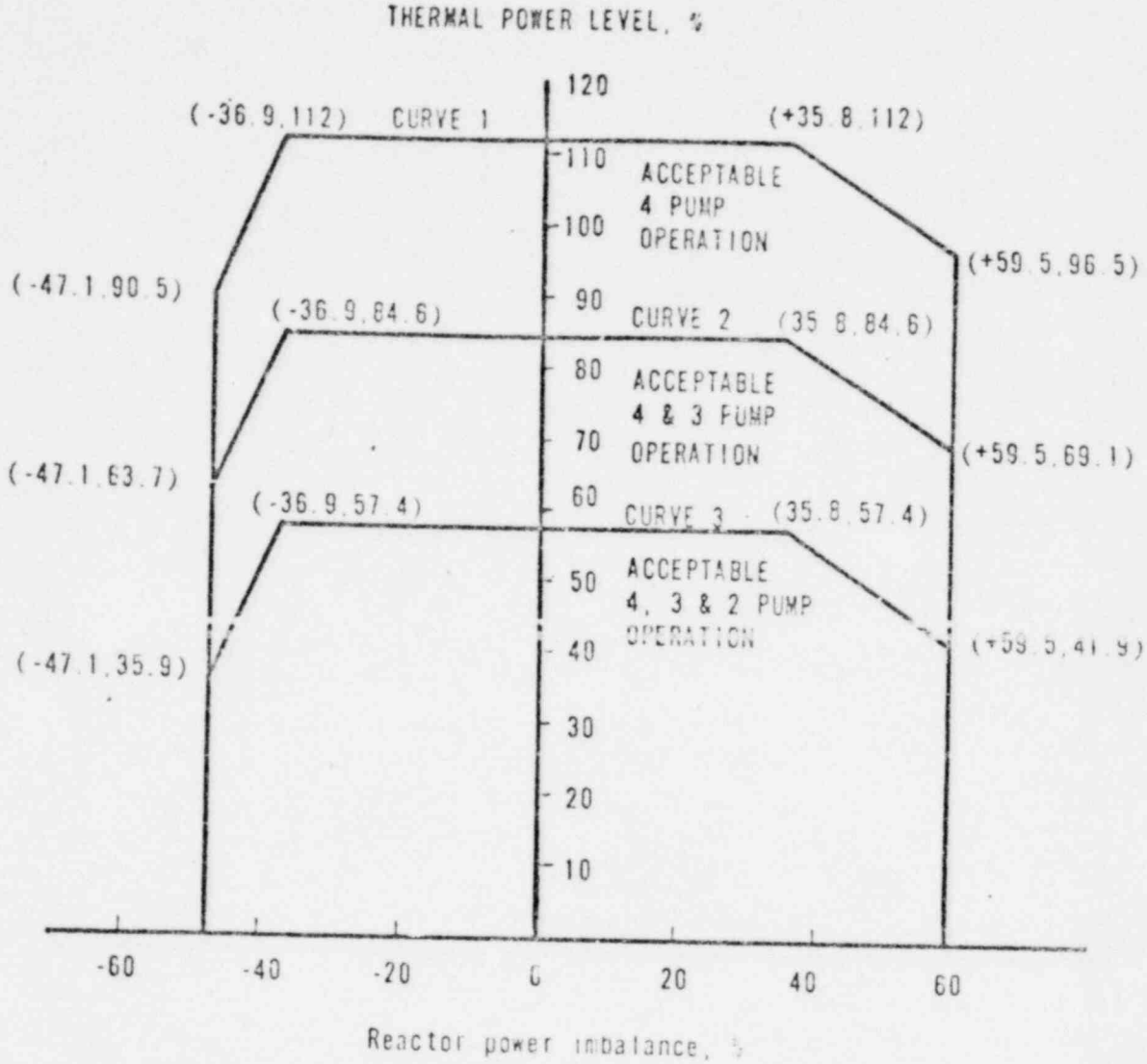
FIGURE 2.1-2 Core Protection Safety Limits, Reactor Power Imbalance (Cycle 4)



CURVE	REACTOR COOLANT DESIGN FLOW, GPM
1	387,600
2	288,374
3	187,986

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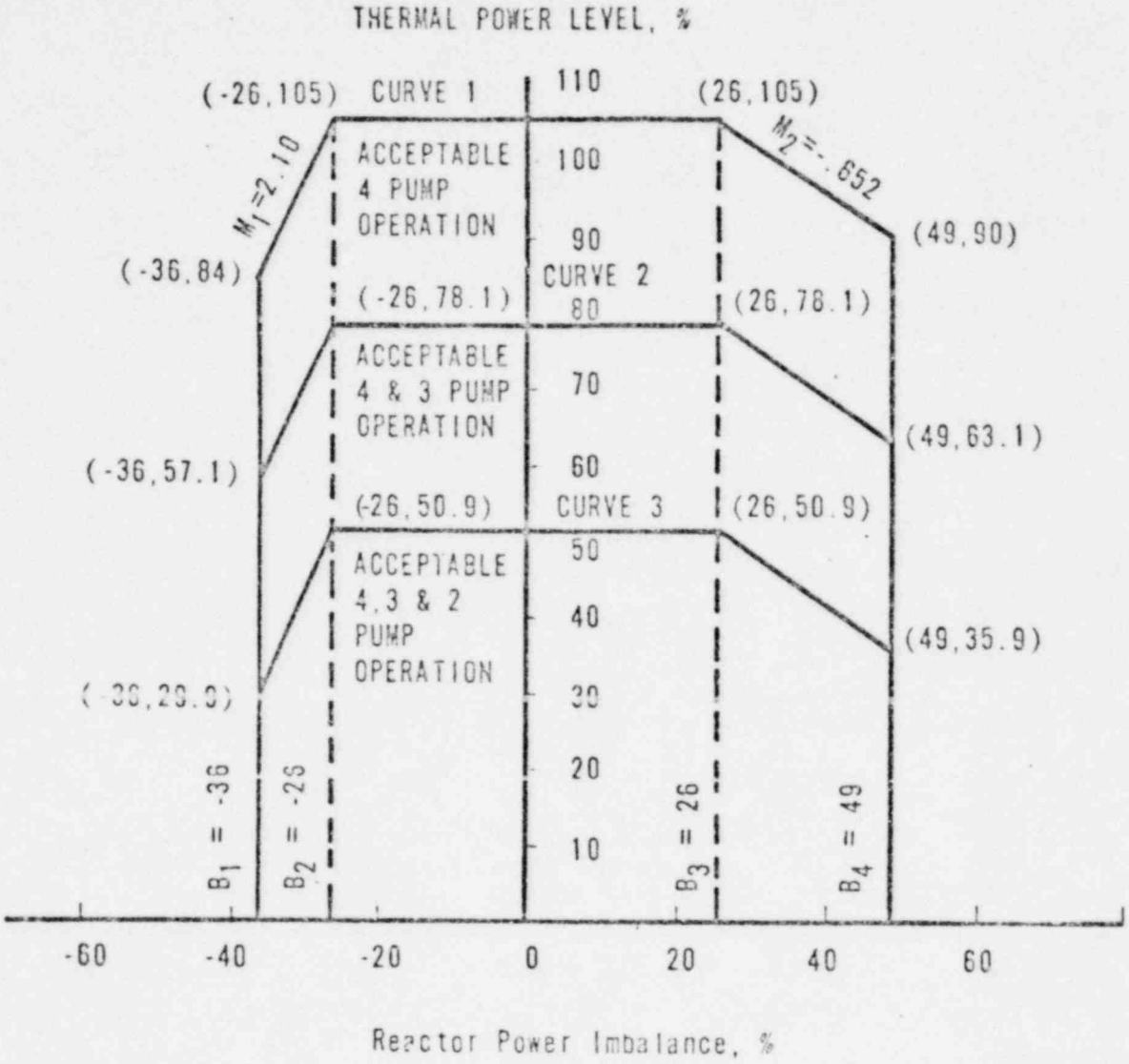
FIGURE 2.3-2 Protective System Maximum Allowable Setpoints, Reactor Power Imbalance (Cycle 4)



CURVE	REACTOR COOLANT DESIGN FLOW, GPM
1	387,600
2	288,374
3	187,986

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FIGURE 3.5.2-1 Rod Index Vs Power Level for Four-Pump Operation, 0 to 160 EFPD (Cycle 4)

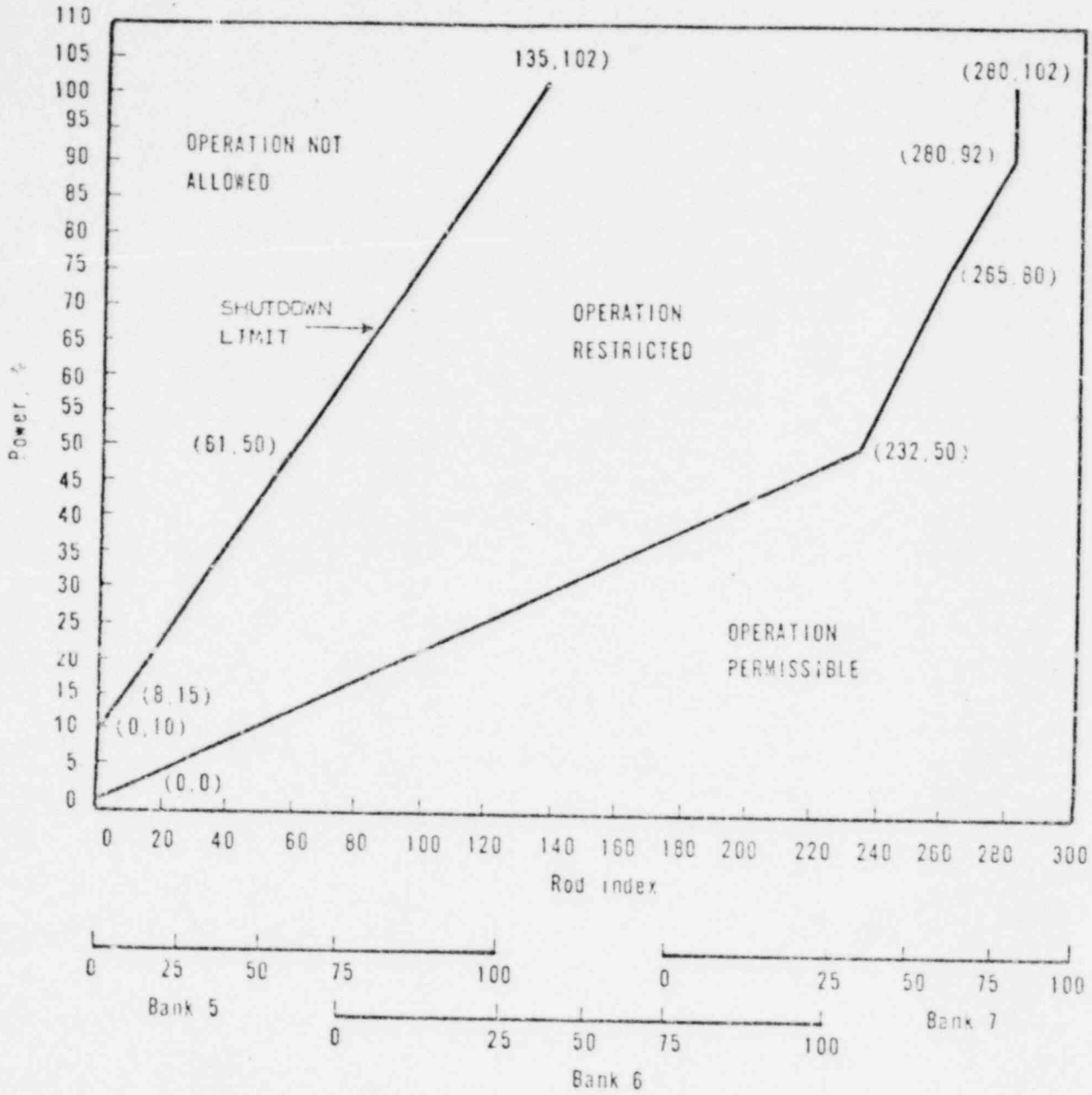

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FIGURE 3.5.2-2 Rod Index Vs Power Level for Four-Pump Operation, 140 to 310 EFPD (Cycle 4)

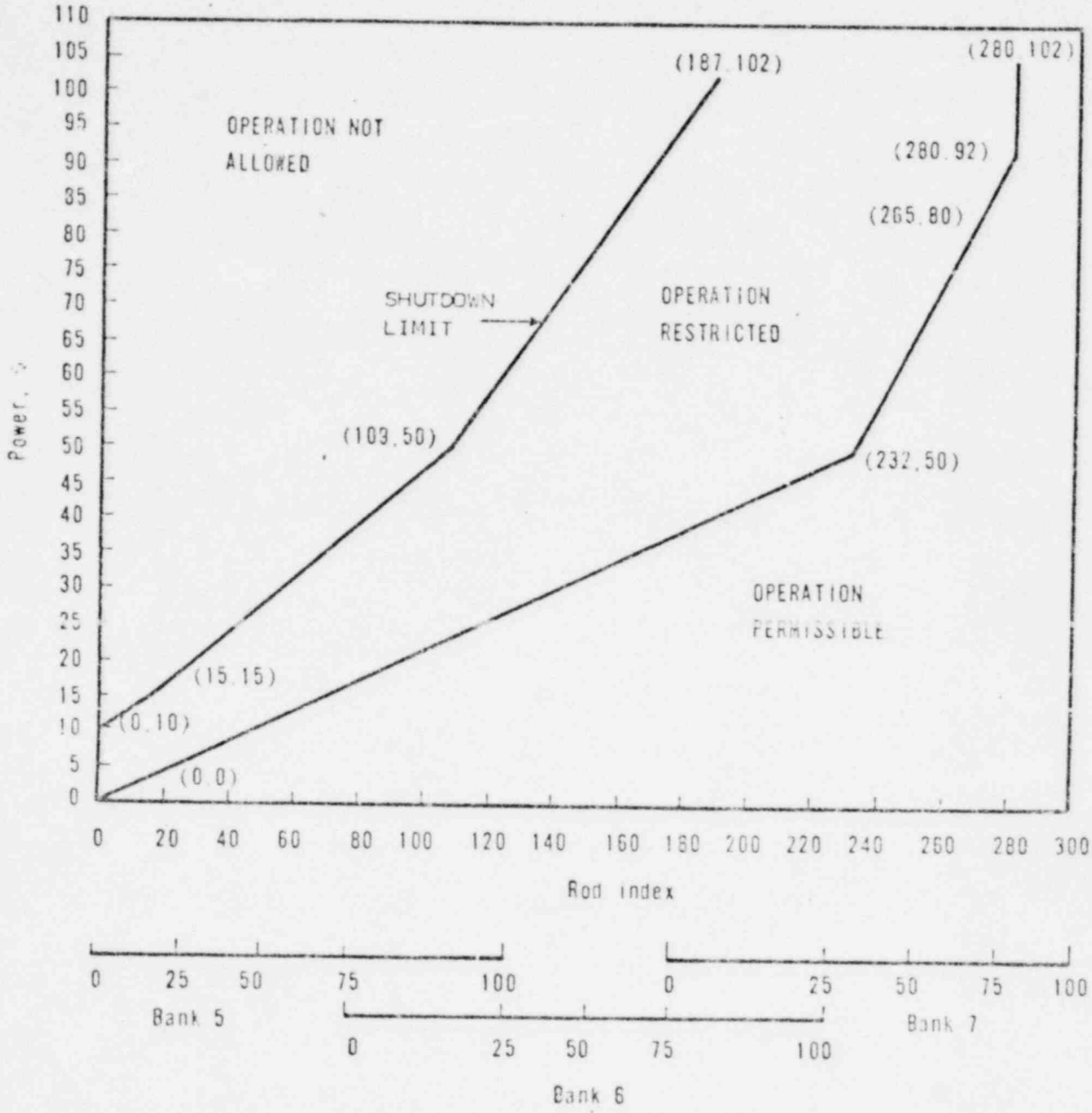

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FIGURE 3.5.2-3. Rod Index Vs Power Level for Four-Pump Operation, 290 to 345 EFPD (Cycle 4)

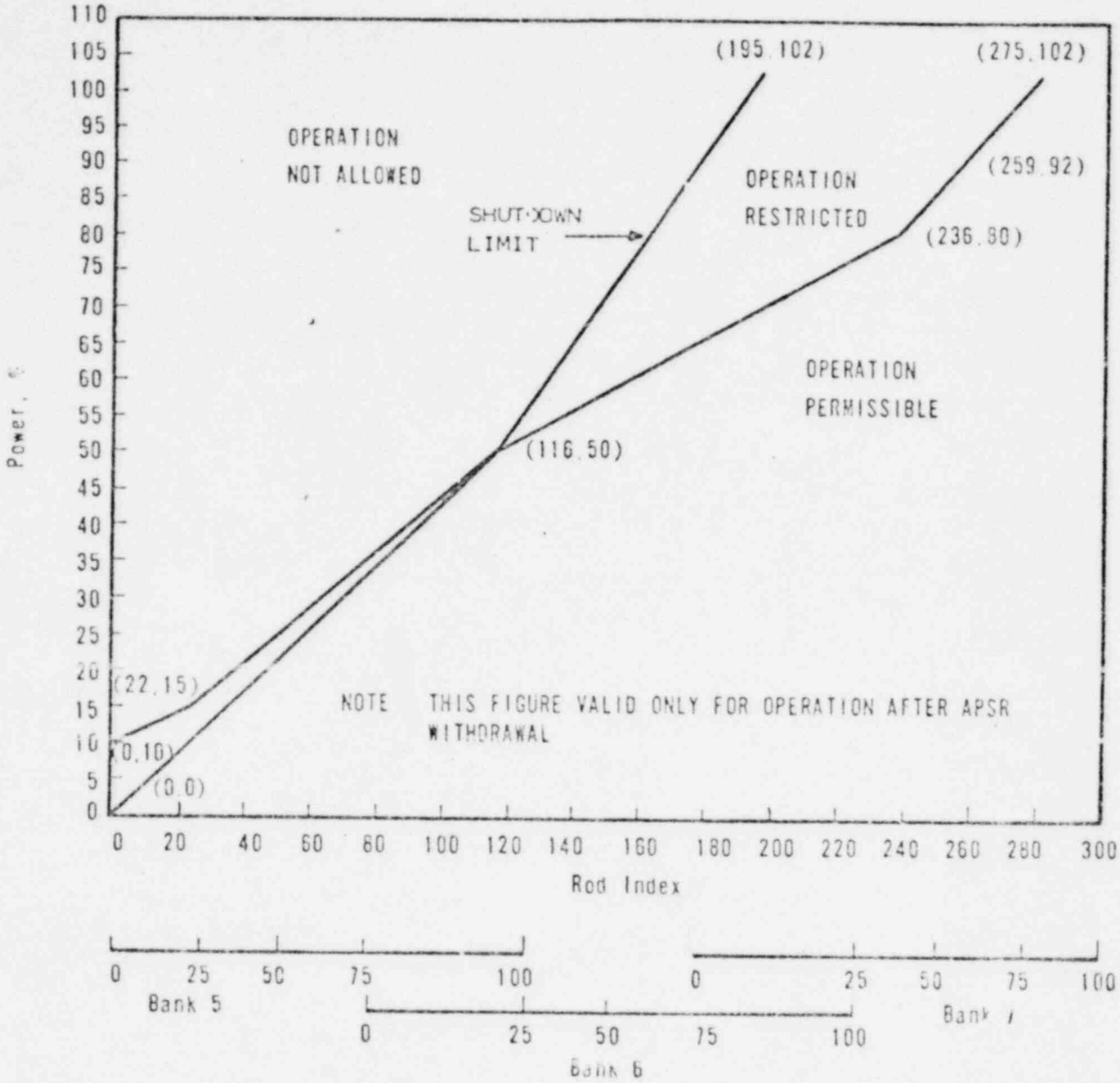

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FIGURE 3.5.2-4. Rod Index Vs Power Level for Three-Pump Operation, 0 to 160 EFPD (Cycle 4)

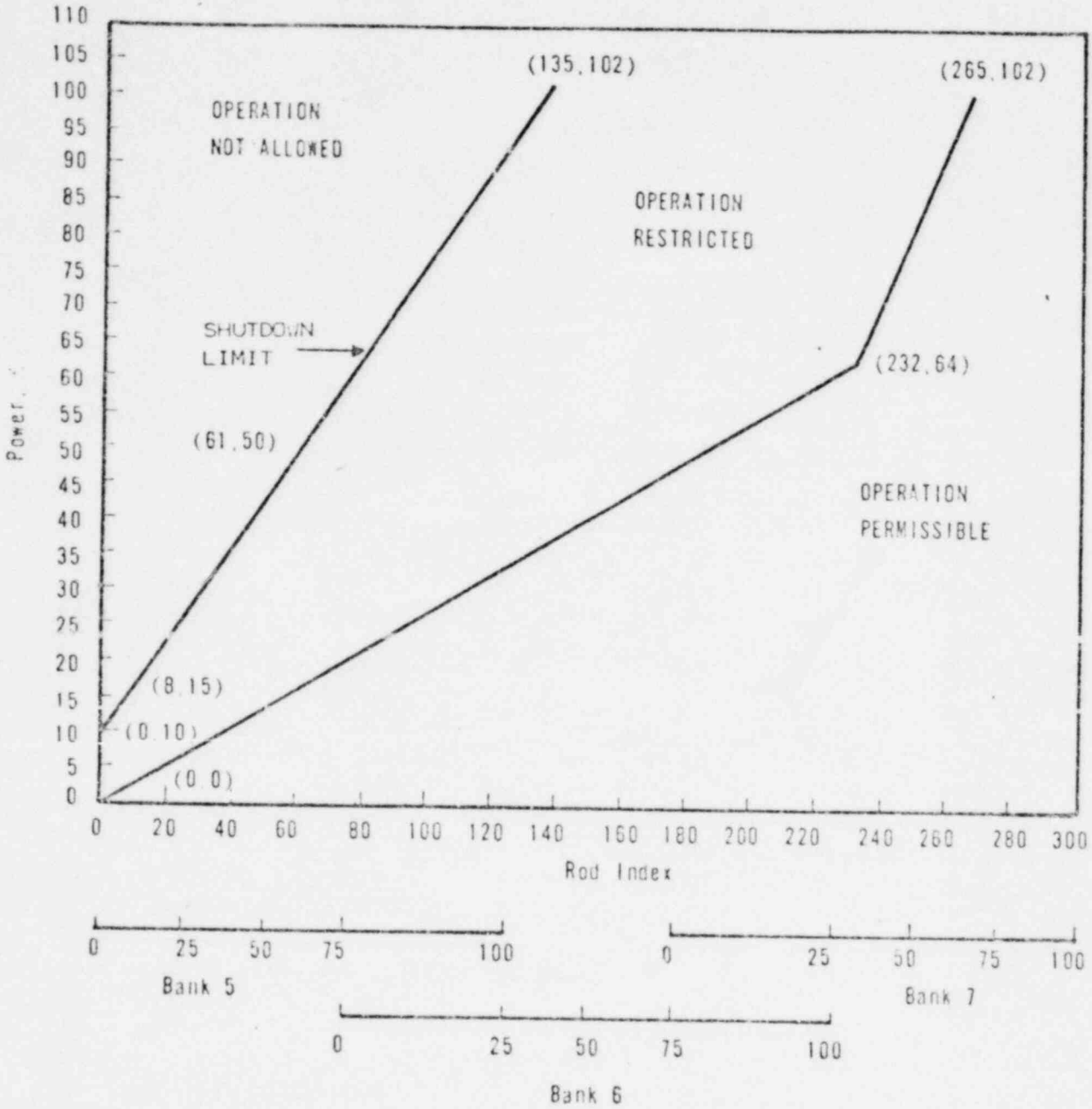

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FIGURE 3.5.2-5 Rod Index Vs Power Level for Three-Pump Operation, 140 to 310 EFPD (Cycle 4)

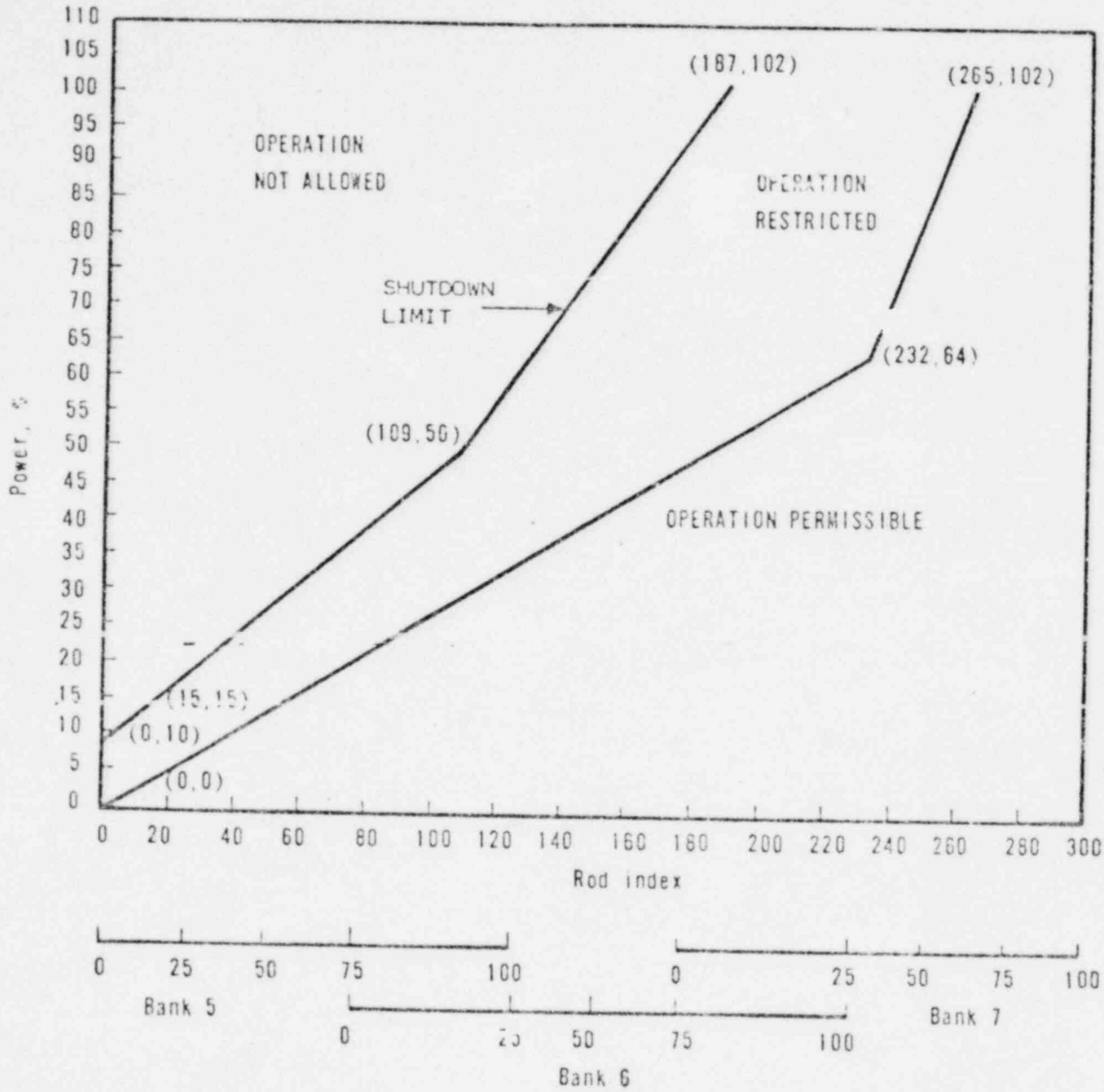

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FIGURE 2.5.2-6 Rod Index Vs Power Level for Three-Pump Operation, 290 to 345 EFPD (Cycle 4)

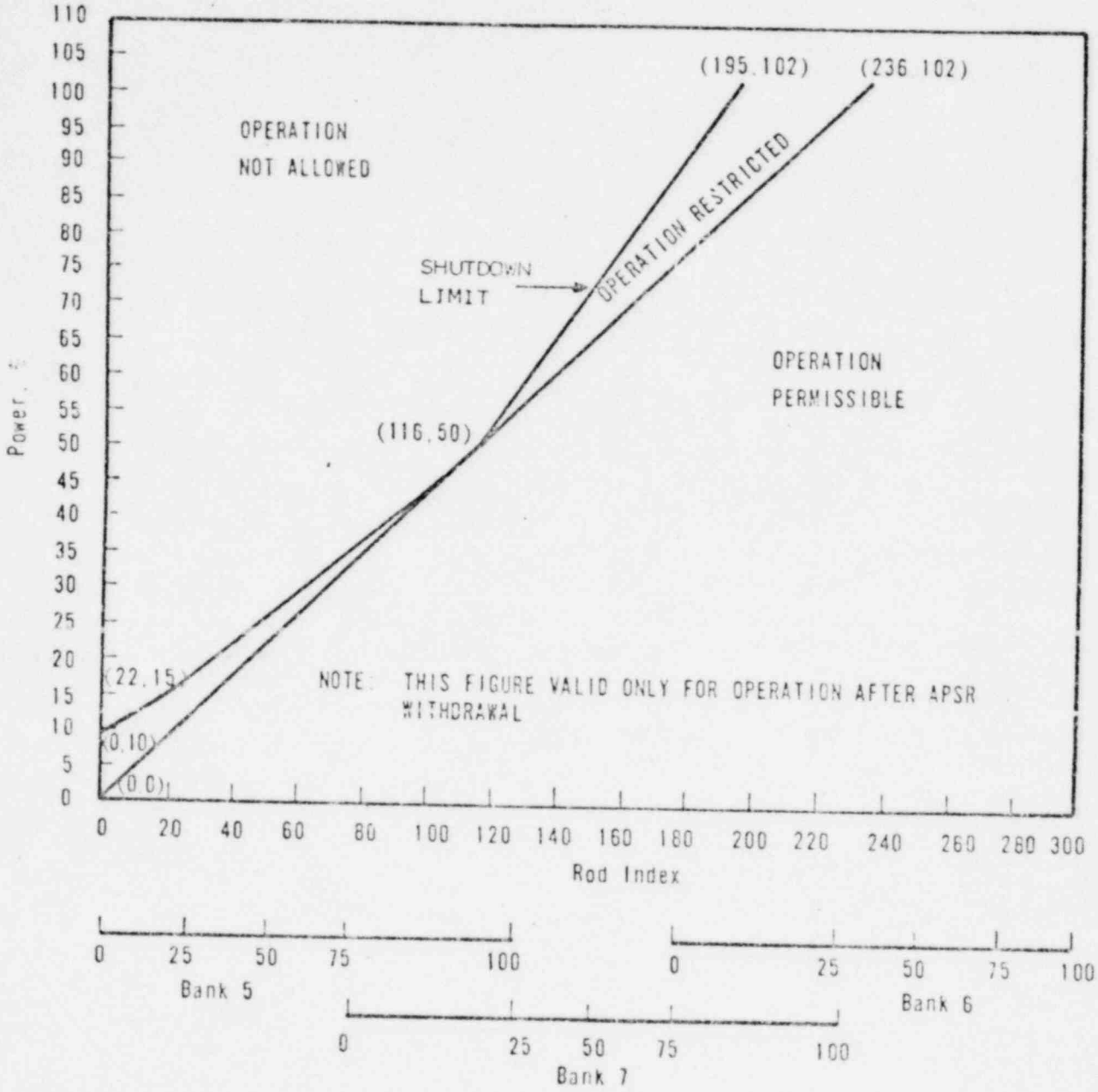

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FIGURE 3.5.2-7 APSR Withdrawal Vs Power Level, 0 to 160 EFPD (Cycle 4)

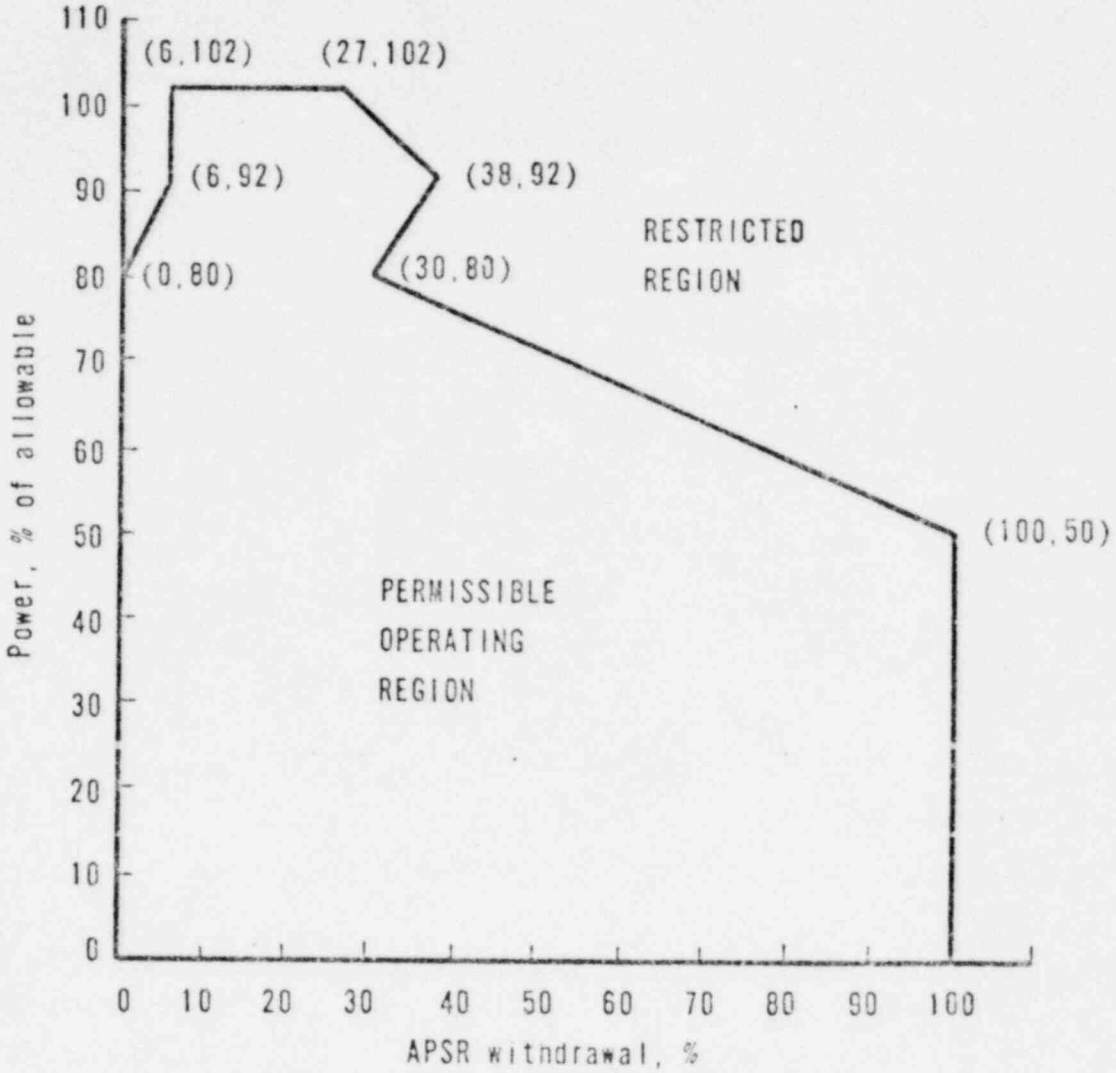

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FIGURE 3.5.2-8 APSR Withdrawal Vs Power Level, 140 to 310 EFPD (Cycle 4)

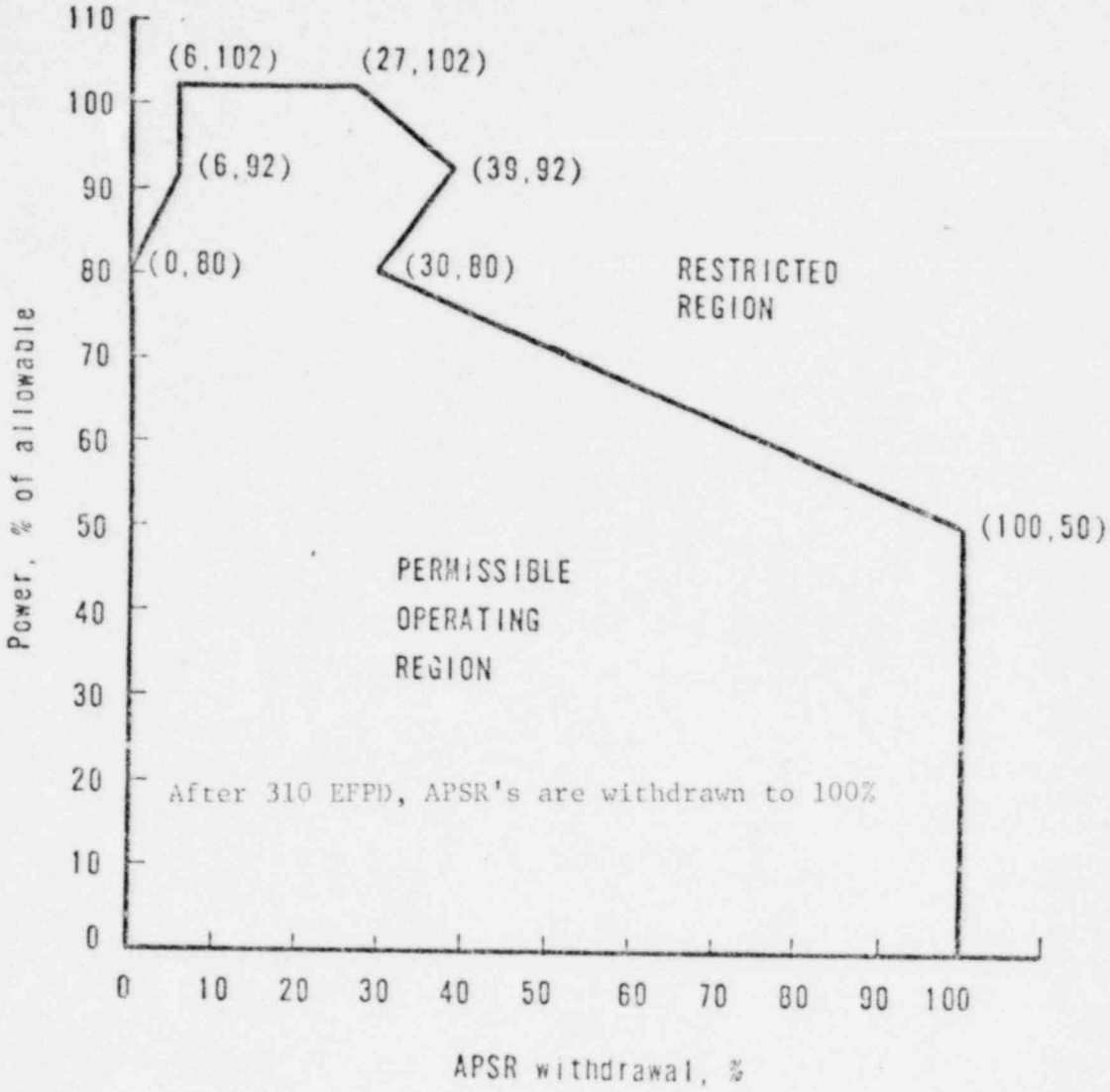

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FIGURE 3.5.2-9 Core Imbalance Vs Power Level, 0 to 160 EFPD (Cycle 4)

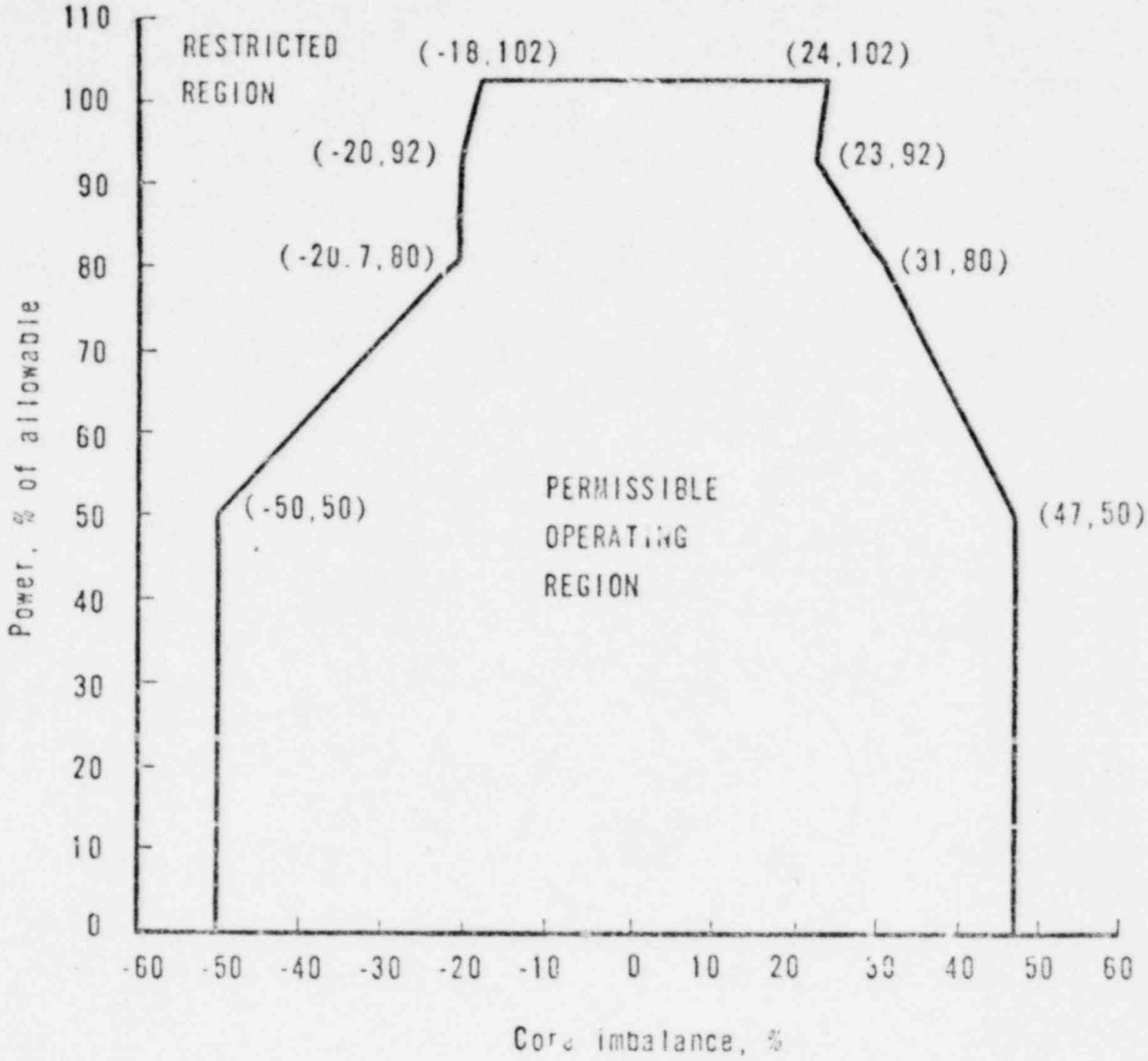

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FIGURE 3.5.2-10 Core Imbalance Vs Power Level, 140 to 310 EFPD (Cycle 4)

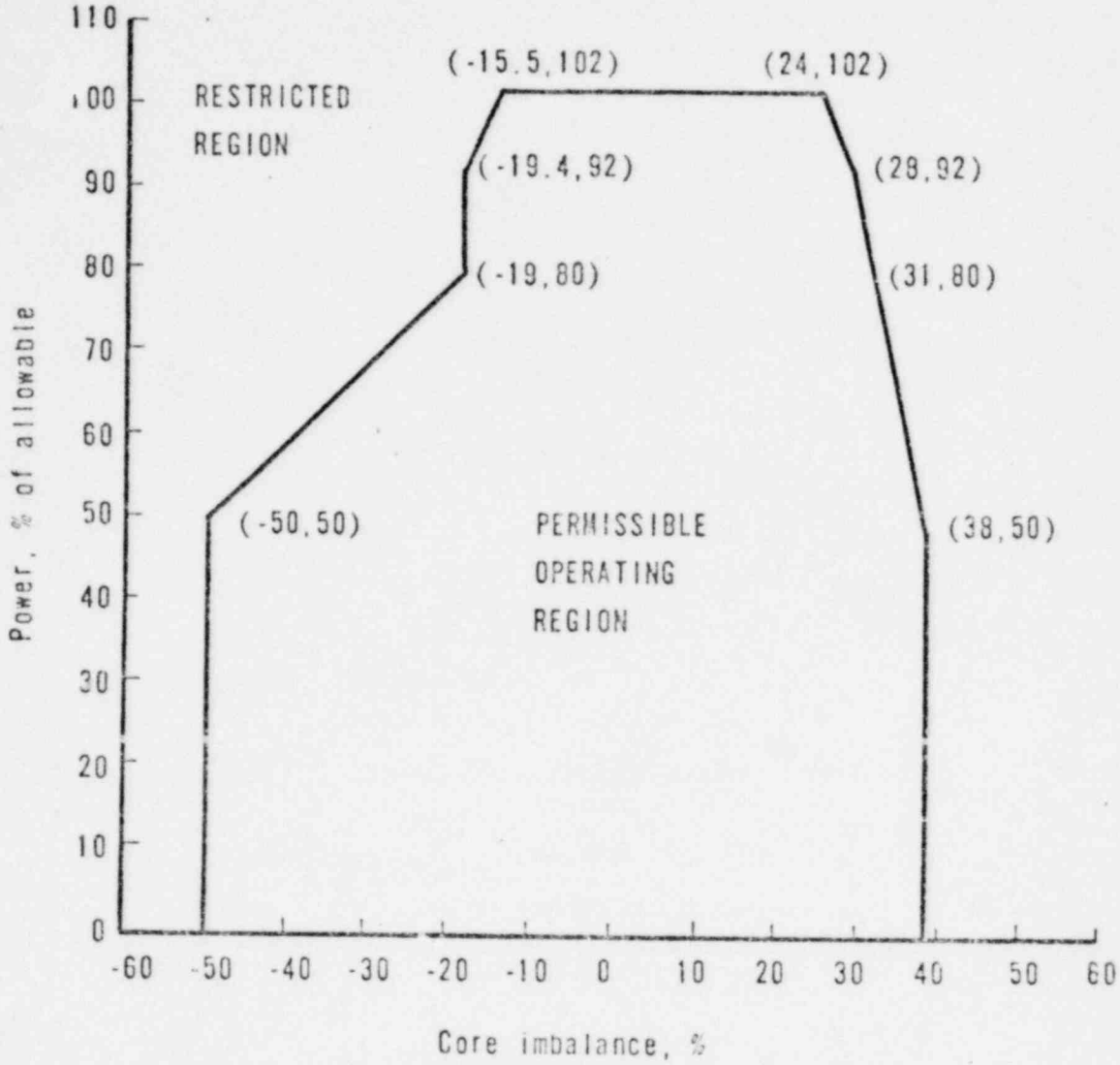

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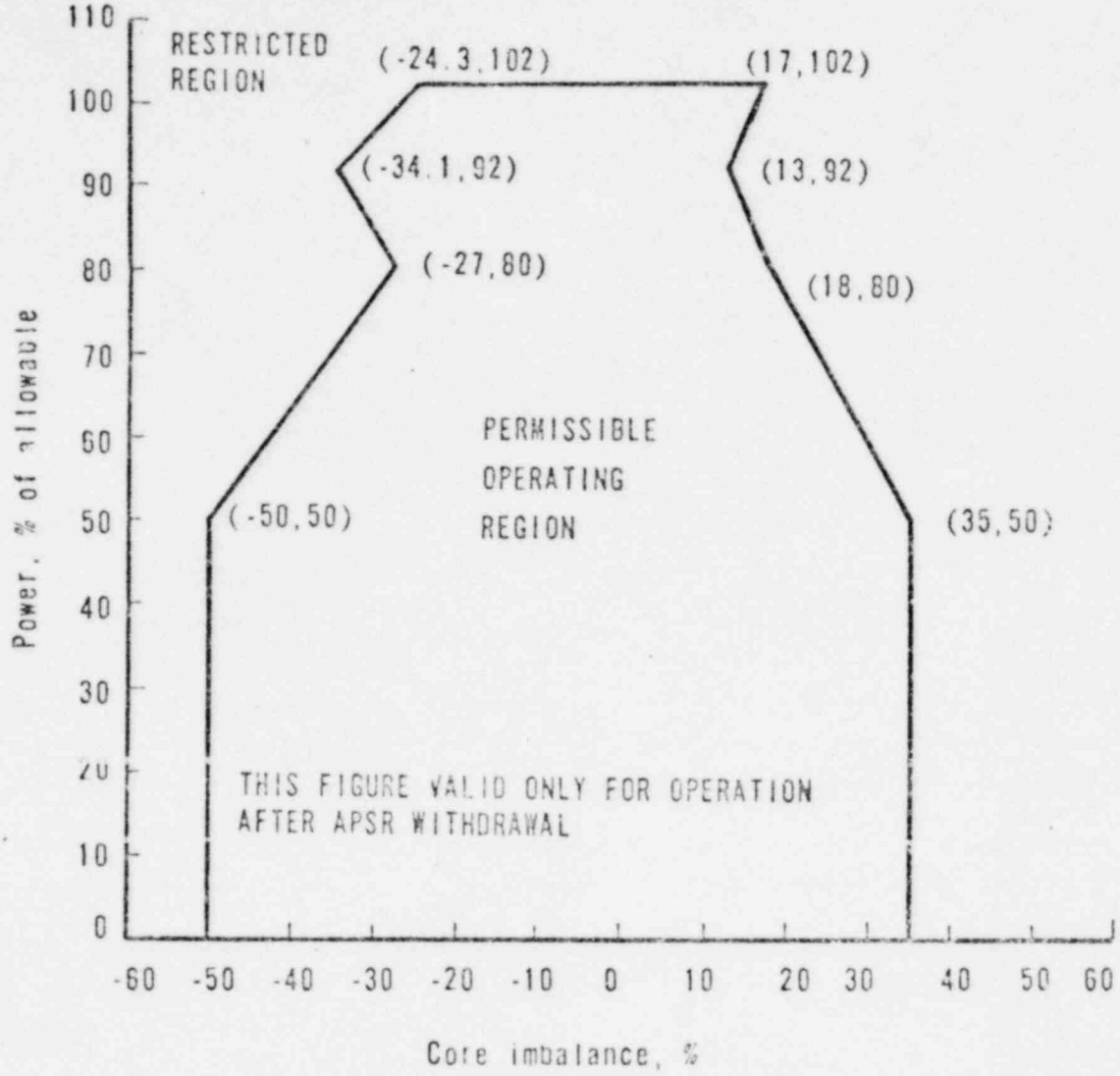
FIGURE 3.5.2-11 Core Imbalance Vs Power Level, 290 to 345 EFPD (Cycle 4)



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