ATTACHMENT A: OPERATION WITH REACTOR COOLANT PUMP POWER MONITORS

I. CHANGE REQUEST

Proposed Changes

These changes address the current reactor refueling for Cycle V. The changes are supported in BAW-1767, Crystal River Unit 3 - Cycle 5 Reload Report, March 1983. Item II of this attachment lists the proposed Technical Specification changes.

These changes include:

1. Reactor core safety limits and trip setpoints for reactor thermal power and axial power imbalance.
2. Minimum boric acid and borated water volumes.
3. Reactor Regulating rod group insertion.
4. Reactor axial power shaping rod group insertion.
5. Reactor axial power imbalance limits
6. Reactor Coolant Pump Power Monitor operability response time requirements.
7. Shutdown Margin Requirements (not supported by BAW-1767 but by Attachment E, Item II).

Reasons for Proposed Changes

Crystal River Unit 3 will operate in Cycle V with 76 fresh fuel assemblies. The Cycle V core has been designed with an increased cycle lifetime of 460 effective full power days (EFPD) and the incorporation of burnable poison rod assemblies to aid in reactivity control. As stated in BAW-1767, certain Technical Specifications require revision due to these fuel and thermal characteristics changing.

Safety Analysis of Proposed Changes

The safety and licensing considerations for operation during Cycle V are described in BAW-1976. These proposed changes will bring the plant Technical Specifications into agreement with the applicable portions of BAW-1767 and insure that the plant will continue to operate in a safe manner.

II. TECHNICAL SPECIFICATION PAGES

TECHNICAL SPECIFICATION NO.	PAGE
Figure 2.1-2	2-3
Table 2.2-1	2-5
Table 2.2-1 (continued)	2-6
Figure 2.2-1	2-7
Bases	B 2-4
Bases	B 2-5
Bases	B 2-6
Bases	B 2-7
3.1.2.8	3/4 1-14
3.1.2.9	3/4 1-16
3.1.3.6	3/4 1-25
Figure 3.1-1	3/4 1-27
Figure 3.1-1a	3/4/1-27a
Figure 3.1-2	3/4 1-28
Figure 3.1-2a	3/4 1-28a
Figure 3.1-3	3/4 1-29
Figure 3.1-3a	3/4 1-29a
Figure 3.1-4	3/4 1-30
Figure 3.1-4a	3/4 1-31
Figure 3.1-7	3/4 1-34
Figure 3.1-9	3/4 1-38
Figure 3.1-9a	3/4 1-38a
Figure 3.1-10	3/4 1-39
Figure 3.2-1	3/4 2-2
Figure 3.2-1a	3/4 2-2a
Figure 3.2-2	3/4 2-3
Table 3.3-2	3/4 3-6
Bases	B 3/4 1-2

FIGURE 2.1-2

REACTOR CORE SAFETY LIMIT

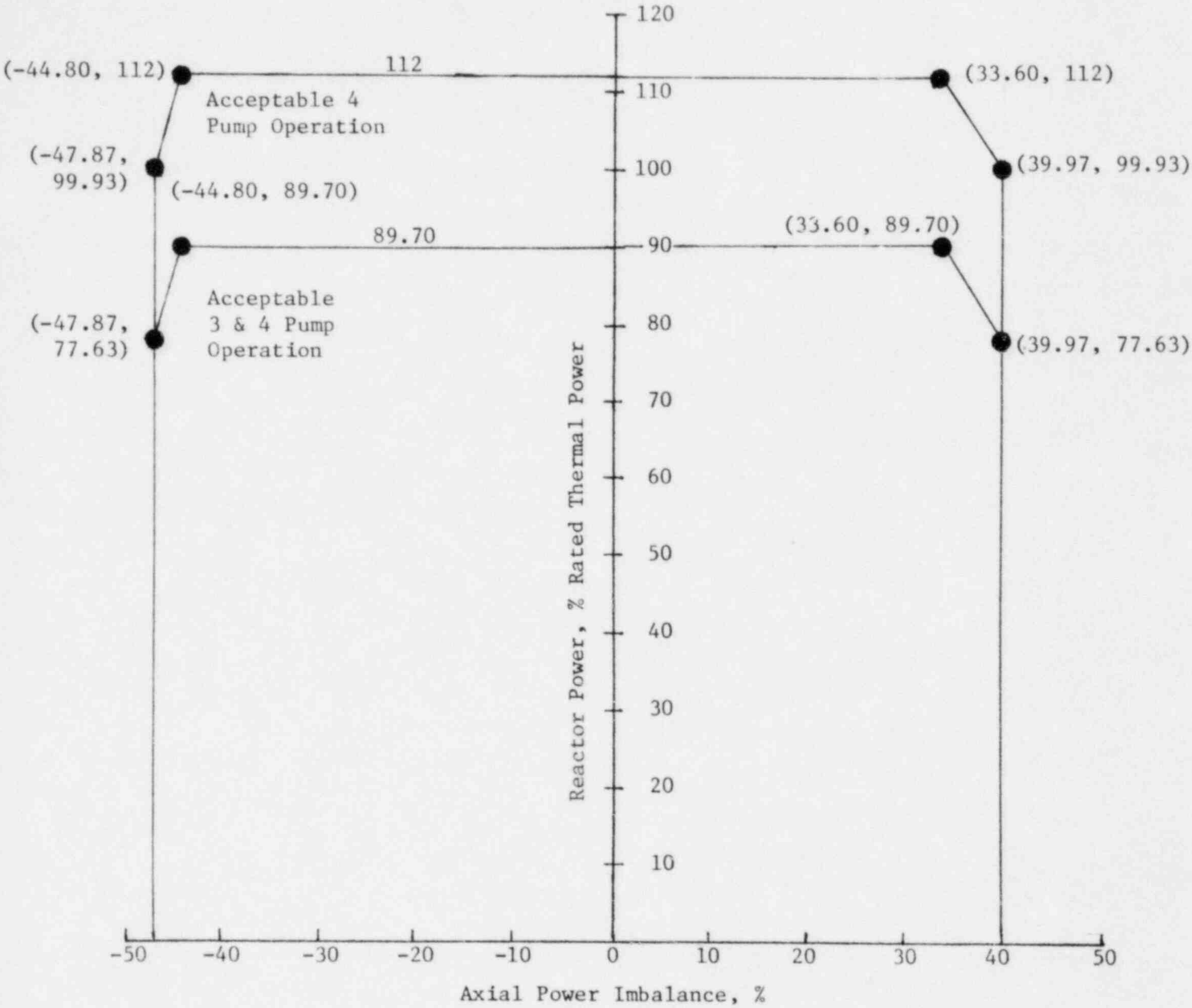


TABLE 2.2-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTION UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1.	Manual Reactor Trip	Not Applicable	Not Applicable
2.	Nuclear Overpower	≦ 102.0% of RATED THERMAL POWER with four pumps operating	≦ 104.9% of RATED THERMAL POWER with four pumps operating
		≦ 79.92% of RATED THERMAL POWER with three pumps operating	≦ 79.92% of RATED THERMAL POWER with three pumps operating
3.	RCS Outlet Temperature - High	≦ 618°F	≦ 618°F
4.	Nuclear Overpower Based on RCS Flow and AXIAL POWER IMBALANCE (1)	Trip Setpoint not to exceed the limit line of Figure 2.2-1	Allowable Values not to exceed the limit line of Figure 2.2-1
5.	RCS Pressure - Low (1)	≧ 1800 psig	≧ 1800 psig
6.	RCS Pressure - High	≦ 2300 psig	≦ 2300 psig
7.	RCS Pressure - Variable Low (1)	≧ (11.59 T_{out} °F - 5037.8) psig	≧ (11.59 T_{out} °F - 5037.8) psig

TABLE 2.2-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION TRIP SETPOINTS

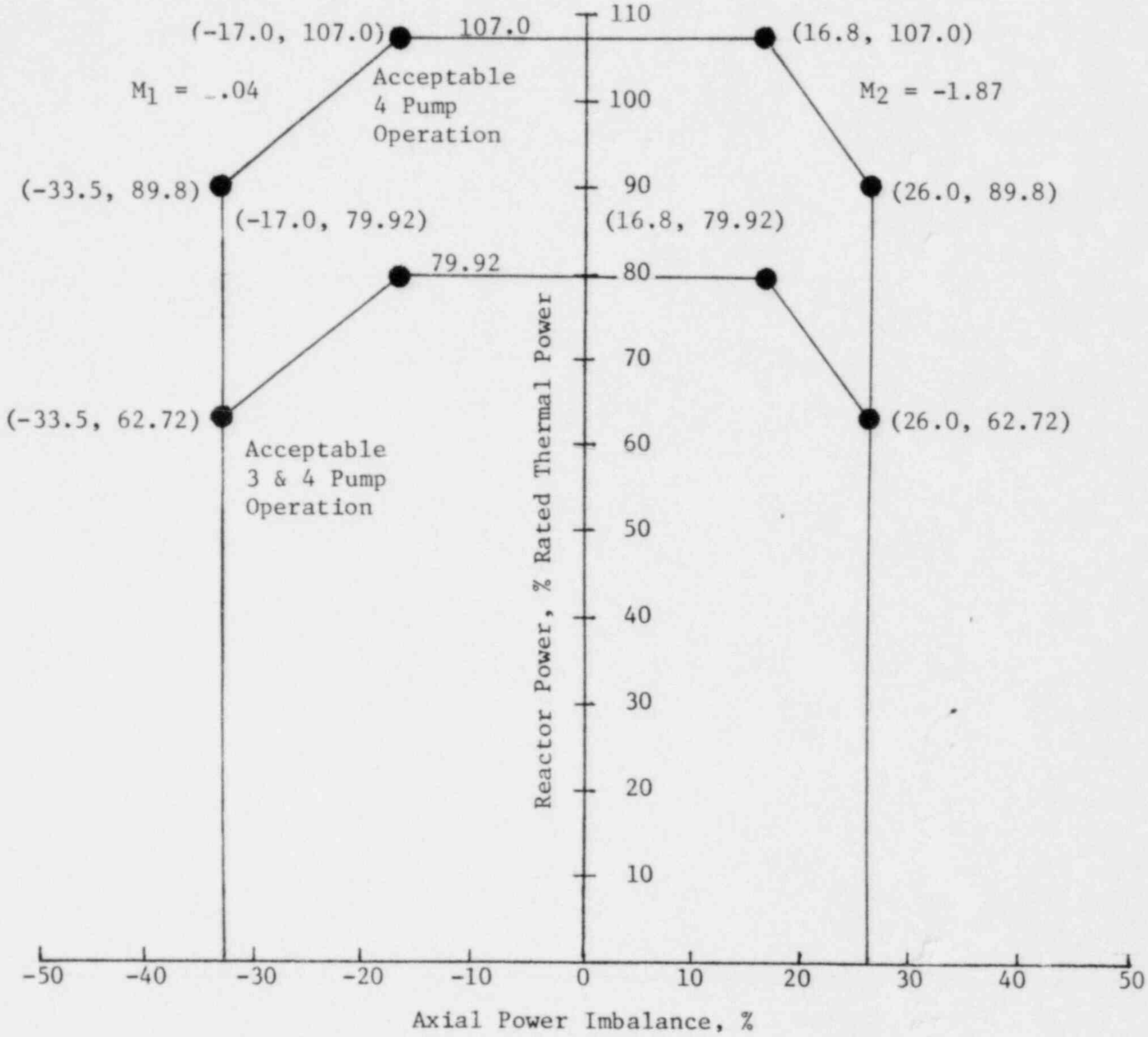
FUNCTION UNIT		TRIP SETPOINT	ALLOWABLE VALUES
8.	Pump Status Based on Reactor Coolant Pump Power Monitors (1)	More than one pump drawing ≤ 1075 or ≥ 14000 kw	More than one pump drawing ≤ 1075 or ≥ 14000 kw
9.	Reactor Containment Vessel Pressure High	≤ 4 psig	≤ 4 psig

(1) Trip may be manually bypassed when RCS pressure ≤ 1720 psig by actuating Shutdown Bypass provided that:

a. The Nuclear Overpower Trip Setpoint is ≤ 5% of RATED THERMAL POWER
b. The Shutdown Bypass RCS Pressure - High Trip Setpoint of ≤ 1720 psig is imposed, and
c. The Shutdown Bypass is removed when RCS Pressure > 1800 psig.

FIGURE 2.2-1

TRIP SETPOINT FOR NUCLEAR OVERPOWER BASED ON RCS FLOW AND AXIAL POWER IMBALANCE



2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

2.2.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Protection System Instrumentation Trip Setpoint specified in Table 2.2-1 are the values at which the Reactor trips are set for each parameter. The Trip Setpoints have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their safety limits. Operation with a trip setpoint less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

The Shutdown Bypass provides for bypassing certain functions of the Reactor Protection System in order to permit control rod drive tests, zero power PHYSICS TESTS and certain startup and shutdown procedures. The purpose of the Shutdown Bypass RCS Pressure-High trip is to prevent normal operation with Shutdown Bypass activated. This high pressure trip setpoint is lower than the normal low pressure trip setpoint so that the reactor must be tripped before the bypass is initiated. The Nuclear Overpower Trip Setpoint of less than or equal to 5.0% prevents any significant reactor power from being produced. Sufficient natural circulation would be available to remove 5.0% of RATED THERMAL POWER if none of the reactor coolant pumps were operating.

Manual Reactor Trip

The Manual Reactor Trip is a redundant channel to the automatic Reactor Protection System instrumentation channels and provides manual reactor trip capability.

Nuclear Overpower

A Nuclear Overpower trip at high power level (neutron flux) provides reactor core protection against reactivity excursions which are too rapid to be protected by temperature and pressure protective circuitry.

During normal station operation, reactor trip is initiated when the reactor power level reaches 104.9% of rated power. Due to calibration and instrument errors, the maximum actual power at which a trip would be actuated could be 112% which was used in the safety analysis.

LIMITING SAFETY SYSTEM SETTINGS

BASES

RCS Outlet Temperature - High

The RCS Outlet Temperature High trip less than or equal to 618°F prevents the reactor outlet temperature from exceeding the design limits and acts as a backup trip for all power excursion transients.

Nuclear Overpower Based on RCS Flow and AXIAL POWER IMBALANCE

The power level trip setpoint produced by the reactor coolant system flow is based on a flux-to-flow ratio which has been established to accommodate flow decreasing transients from high power.

The power level trip setpoint produced by the power-to-flow ratio provides both high power level and low flow protection in the event the reactor power level increases or the reactor coolant flow rate decreases. The power level setpoint produced by the power-to-flow ratio provides overpower DNB protection for all modes of pump operation. For every flow rate there is a maximum permissible power level, and for every power level there is a minimum permissible low flow rate. Typical power level and low flow rate combinations for the pump situations of Table 2.2-1 are as follows:

1. Trip would occur when four reactor coolant pumps are operating if power is greater than or equal to 107% and reactor flow rate is 100%, or flow rate is less than or equal to 93.45% and power level is 100%.

2. Trip would occur when three reactor coolant pumps are operating if power is greater than or equal to 79.92% and reactor flow rate is 74.7%, or flow rate is less than or equal to 70.09% and power is 75%.

For safety calculations the maximum calibration and instrumentation errors for the power level were used.

The AXIAL POWER IMBALANCE boundaries are established in order to prevent reactor thermal limits from being exceeded. These thermal limits are either power peaking kw/ft limits or DNBR limits. The AXIAL POWER IMBALANCE reduces the power level trip produced by the flux-to-flow ratio such that the boundaries of Figure 2.2-1 are produced. The flux-to-flow ratio reduces the power level trip and associated reactor power-reactor power-imbalance boundaries by 1.07% for a 1% flow reduction.

RCS Pressure - Low, High, and Variable Low

The High and Low trips are provided to limit the pressure range in which reactor operation is permitted.

During a slow reactivity insertion startup accident from low power or a slow reactivity insertion from high power, the RCS Pressure-High setpoint is reached before the Nuclear Overpower Trip Setpoint. The trip setpoint for RCS Pressure-High, 2300 psig, has been established to maintain the system pressure below the safety limit, 2750 psig, for any design transient. The RCS Pressure-High trip is backed up by the pressurizer code safety valves for RCS over pressure protection is therefore, set lower than the set pressure for these valves, 2500 psig. The RCS Pressure-High trip also backs up the Nuclear Overpower trip.

The RCS Pressure-Low, 1800 psig, and RCS Pressure-Variable low, (11.59 T_{out} ^{o}F -5037.8) psig, Trip Setpoints have been established to maintain the DNB ratio greater than or equal to 1.30 for those design accidents that result in a pressure reduction. It also prevents reactor operation at pressures below the valid range of DNS correlation limits, protecting against DNB.

Due to the calibration and instrumentation errors, the safety analysis used a RCS Pressure-Variable Low Trip Setpoint of (11.59 T_{out} ^{o}F -5077.8) psig.

Reactor Containment Vessel Pressure - High

The Reactor Containment Vessel Pressure-High Trip Setpoint ≤ 4 psig, provides positive assurance that a reactor trip will occur in the unlikely event of a steam line failure in the containment vessel or a loss-of-coolant accident, even in the absence of a RCS Pressure - Low trip.

Reactor Coolant Pump Power Monitors

In conjunction with the power/imbalance/flow trips, the Reactor Coolant Pump Power Monitors trip prevents the minimum core DNBR from decreasing below 1.30 by tripping the reactor due to more than one reactor coolant pump not operating.

A reactor coolant pump is considered to be not operating when the power required by the pump is ≥ 190% or is ≤ 19.5% of the nominal operating power. The nominal operating power decreases from when a pump is started during heatup and is pumping dense fluid (typically 7500 kW) to when a pump is operating at full power and is pumping less dense fluid (typically 5500 kW). In order to avoid spurious trips during normal operation, the 190% trip setpoint (14000 kW) is based on the nominal operating power for a pump during heatup and the 19.5% trip setpoint (1075 kW) is based on the maximum time within which an RCPPM RPS trip must occur to provide protection for the four pump coastdown. Florida Power has agreed to take credit for the pump overpower trip in order to assure that certain potential faults such as a seismically induced fault high signal will not prevent this instrumentation from providing the protective action (i.e., a trip signal).

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.8 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A concentrated boric acid storage system and associated heat tracing with:

1. A minimum contained borated water volume of 6,356 gallons,

2. Between 11,600 and 14,000 ppm of boron, and

3. A minimum solution temperature of 105°F.

b. The borated water storage tank (BWST) with:

1. A minimum contained borated water volume of 13,500 gallons,

2. A minimum boron concentration of 2,270 ppm, and

3. A minimum solution temperature of 40°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no borated water sources OPERABLE, suspend all operations involving CORE ALTERATION or positive reactivity changes until at least one borated water source is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.8 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,

2. Verifying the contained borated water volume of the tank, and

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.9 Each of the following borated water sources shall be OPERABLE

a. A concentrated boric acid storage system and associated heat tracing with:

1. A minimum contained borated water volume of 6,356 gallons,
2. Between 11,600 and 14,000 ppm of boron, and
3. A minimum solution temperature of 105°F.

b. The borated water storage tank (BWST) with:

1. A minimum contained borated water volume of 415,200 gallons,
2. Between 2,270 and 2,450 ppm of boron, and
3. A minimum solution temperature of 40°F.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

MODES 1, 2, and 3:

a. With the concentrated boric acid storage system inoperable, restore the storage system to OPERABLE within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% Δ k/k at 200°F within the next 6 hours; restore at least one boric acid pump to OPERABLE status the next 7 days or be in HOT SHUTDOWN within the next 30 hours.

b. With the borated water storage tank inoperable, the tank to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 30 hours.

MODE 4:

a. With the concentrated boric acid storage system inoperable, restore the storage system to OPERABLE status within 72 hours or be

REACTIVITY CONTROL SYSTEMS

REGULATING ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The regulating rod groups shall be limited in physical insertion as shown on Figures 3.1-1, 3.1-1a, 3.1-2, 3.1-2a, 3.1-3, 3.1-3a, 3.1-4 and 3.1-4a with a rod group overlap of 25 $\pm$ 5% between sequential withdrawn groups 5 and 6, and 6 and 7.

APPLICABILITY: MODES 1* and 2*#

ACTION:

With the regulating rod groups inserted beyond the above insertion limits, or with any group sequence or overlap outside the specified limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, either:

a. Restore the regulating groups to within the limits within 2 hours, or

b. Reduce THERMAL POWER to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the rod group position using the above figures within 2 hours, or

c. Be in at least HOT STANDBY within 6 hours.

---

* See Special Test Exceptions 3.10.1 and 3.10.2.

With K_{eff} greater than or equal to 1.0.

FIGURE 3.1-1

REGULATING ROD GROUP INSERTION LIMITS FOR
FOUR PUMP OPERATION FROM 0 EFPD TO 30 (+10/-0) EFPD

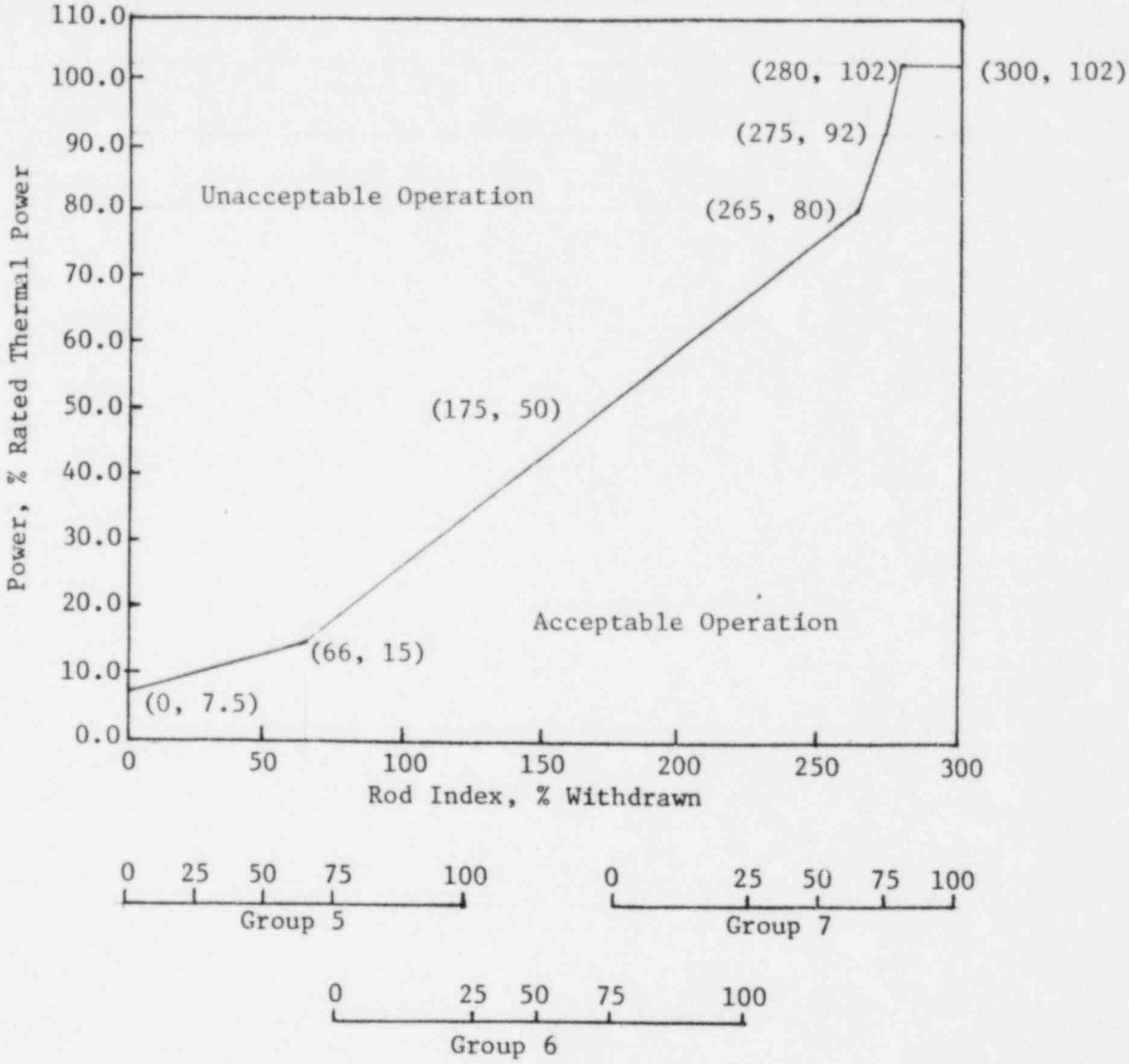


FIGURE 3.1-1a

REGULATING ROD GROUP INSERTION LIMITS FOR
FOUR PUMP OPERATION FROM 30 (+10/-0) TO 250 ± 10 EFPD

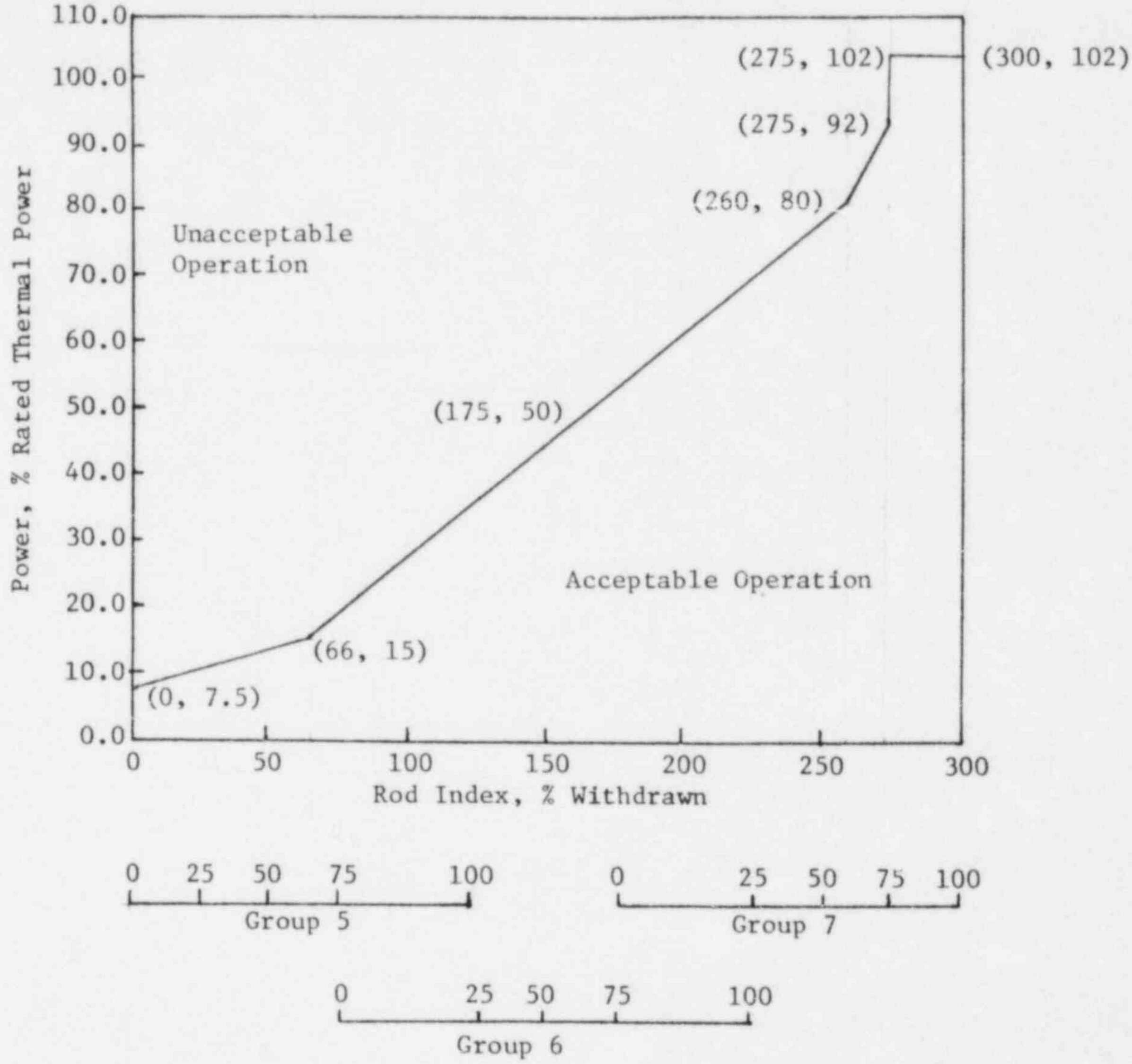


FIGURE 3.1-2

REGULATING ROD GROUP INSERTION LIMITS FOR FOUR PUMP OPERATION FROM 250 ± 10 TO 399 ± 10 EFPD

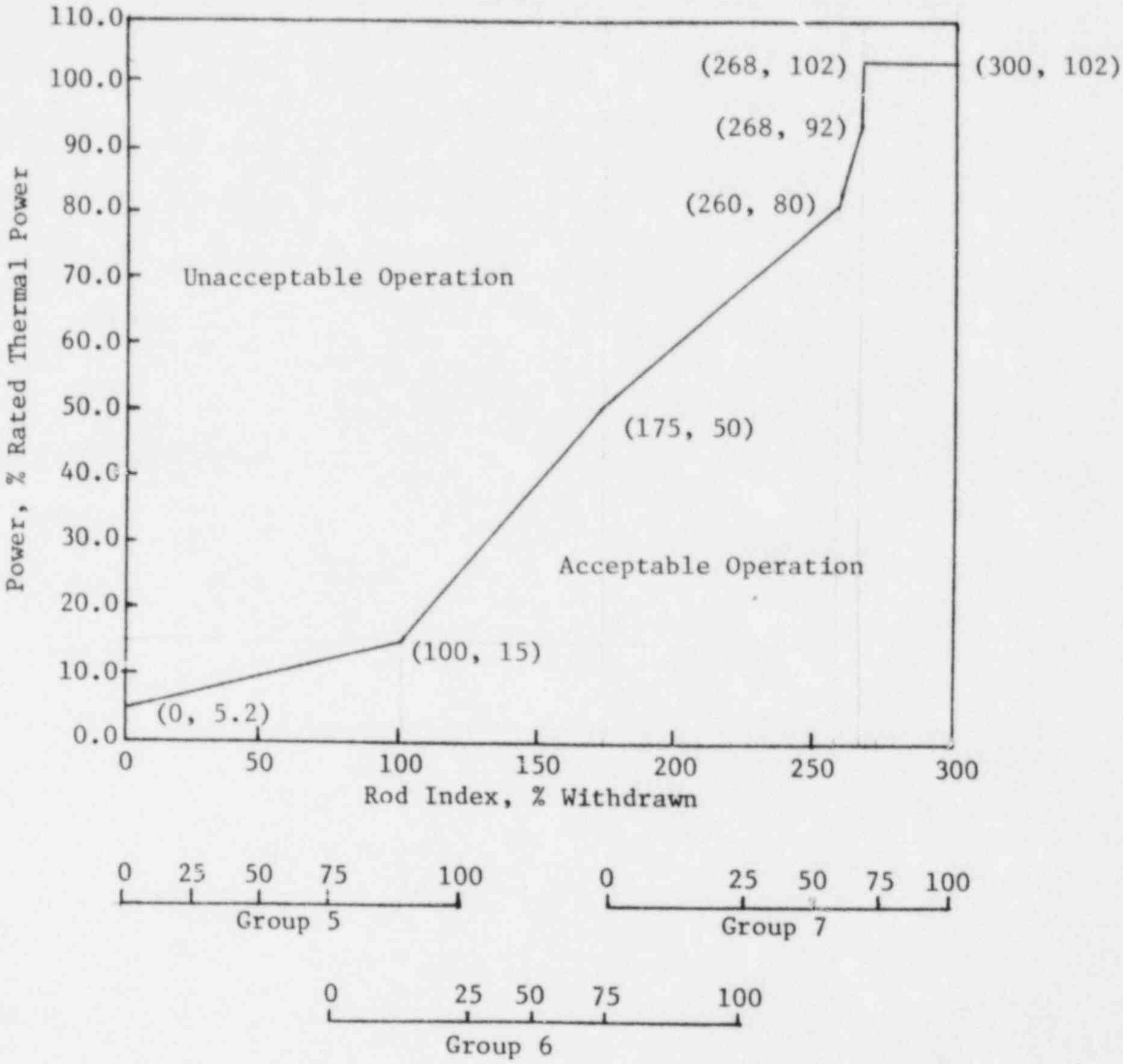


FIGURE 3.1-2a

REGULATING ROD GROUP INSERTION LIMITS FOR FOUR PUMP OPERATION AFTER 399 ± 10 EFPD

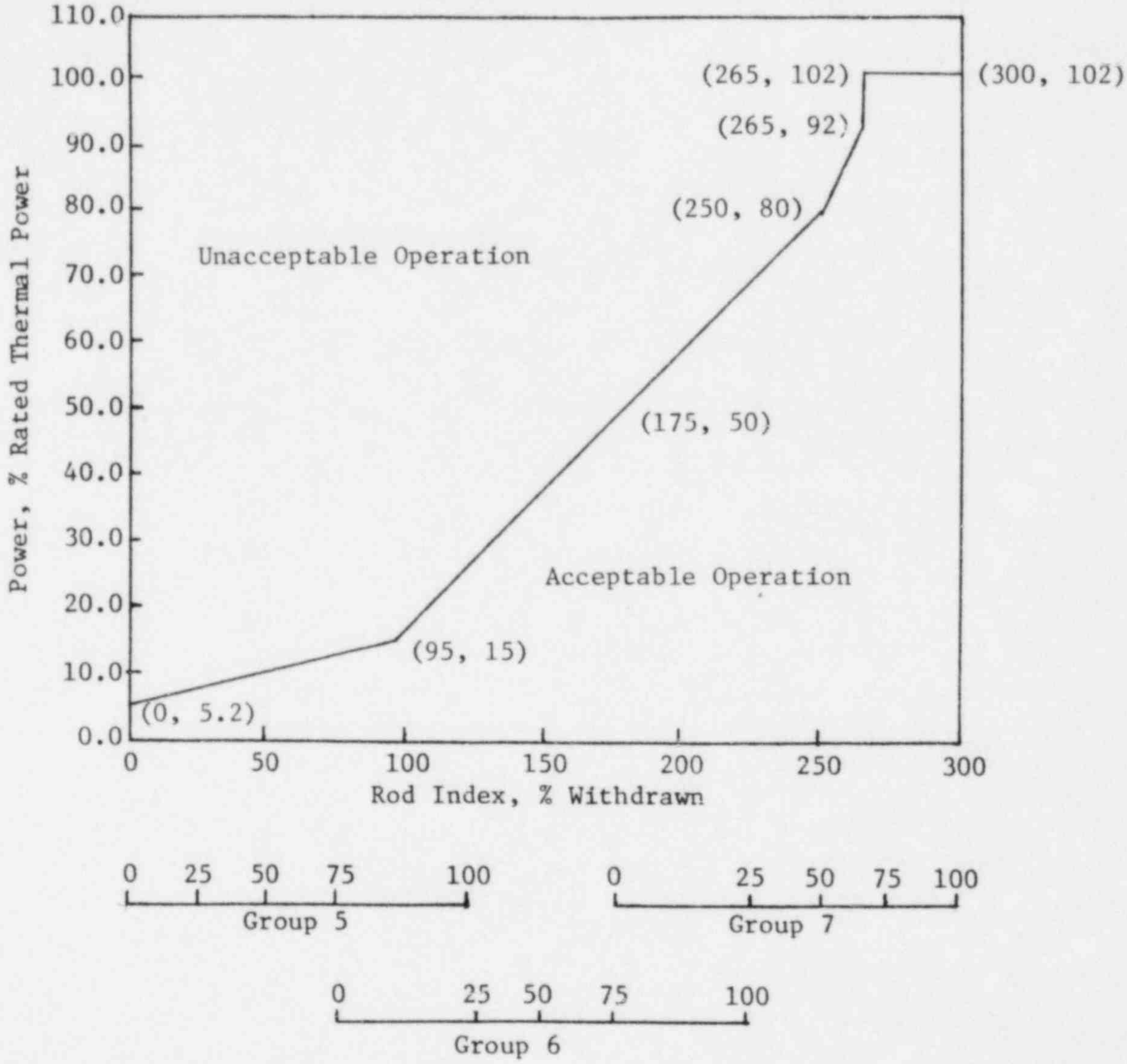


FIGURE 3.1-3

REGULATING ROD GROUP INSERTION LIMITS FOR
THREE PUMP OPERATION FROM 0 TO 30 (+10/-0) EFPD

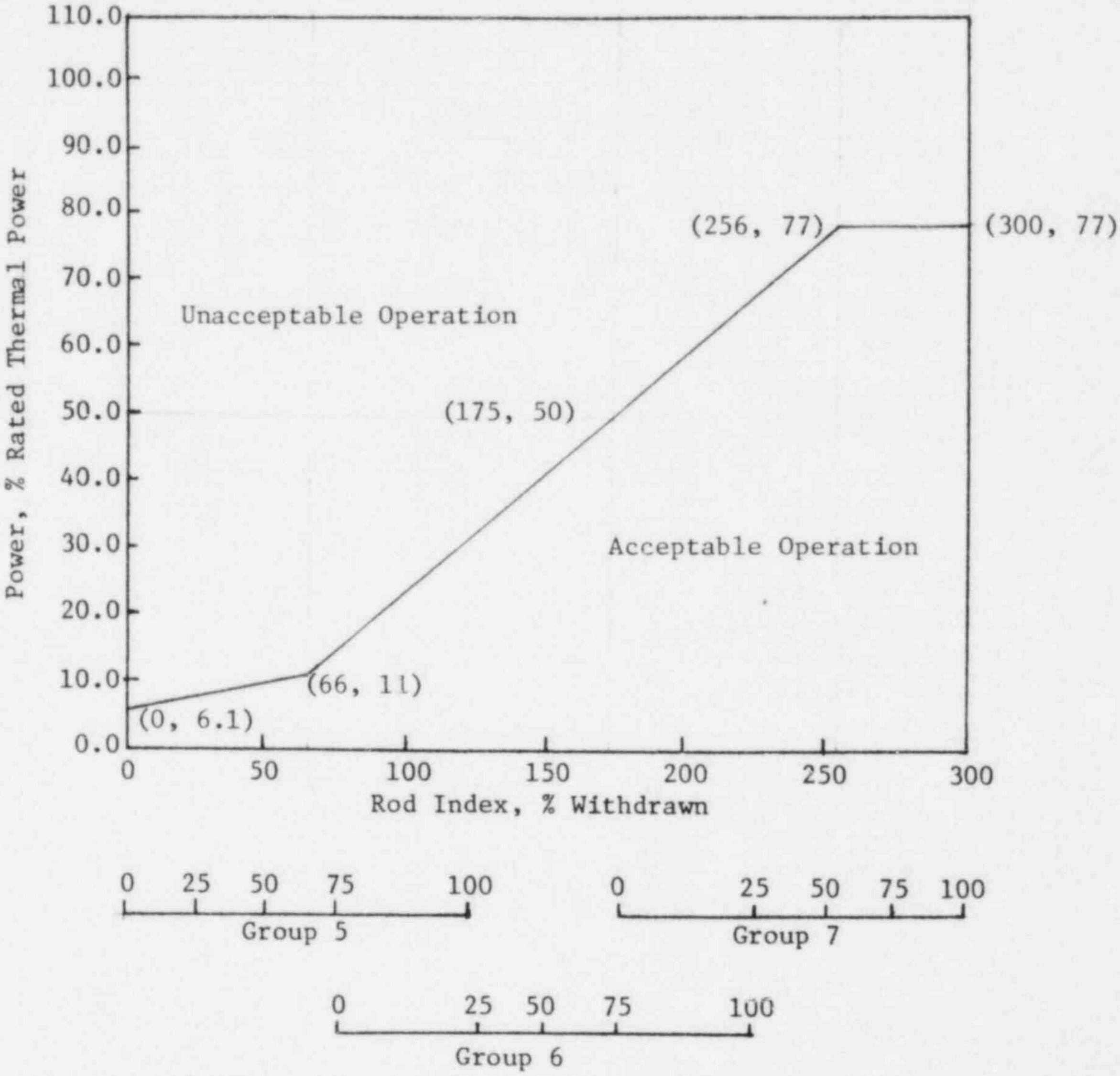


FIGURE 3.1-3a

REGULATING ROD GROUP INSERTION LIMITS FOR
THREE PUMP OPERATION FROM 30 (+10/-o) TO 250 ± 10 EFPD

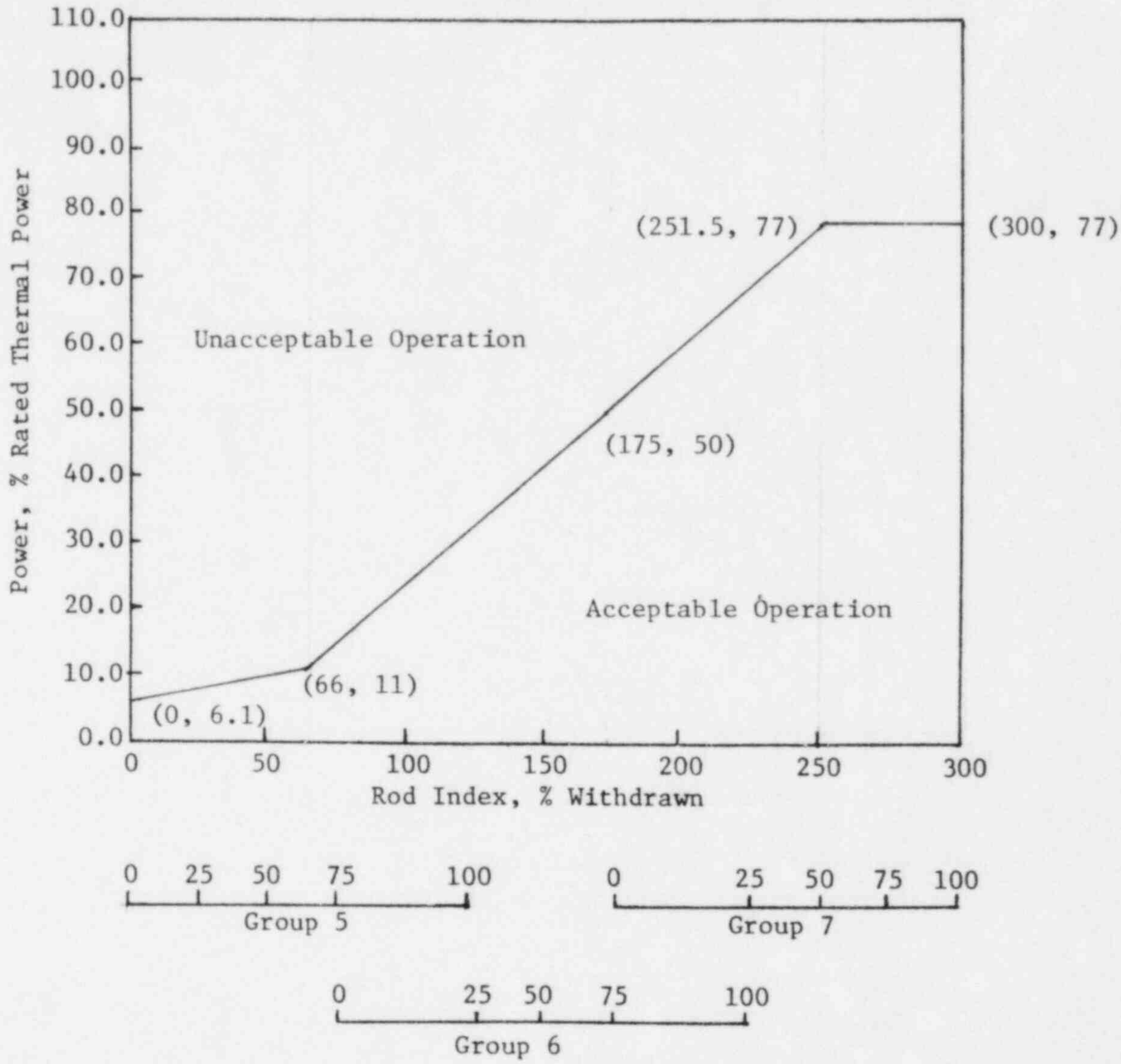


FIGURE 3.1-4

REGULATING ROD GROUP INSERTION LIMITS FOR
THREE PUMP OPERATION FROM 250 ± 10 TO 399 ± 10 EFPD

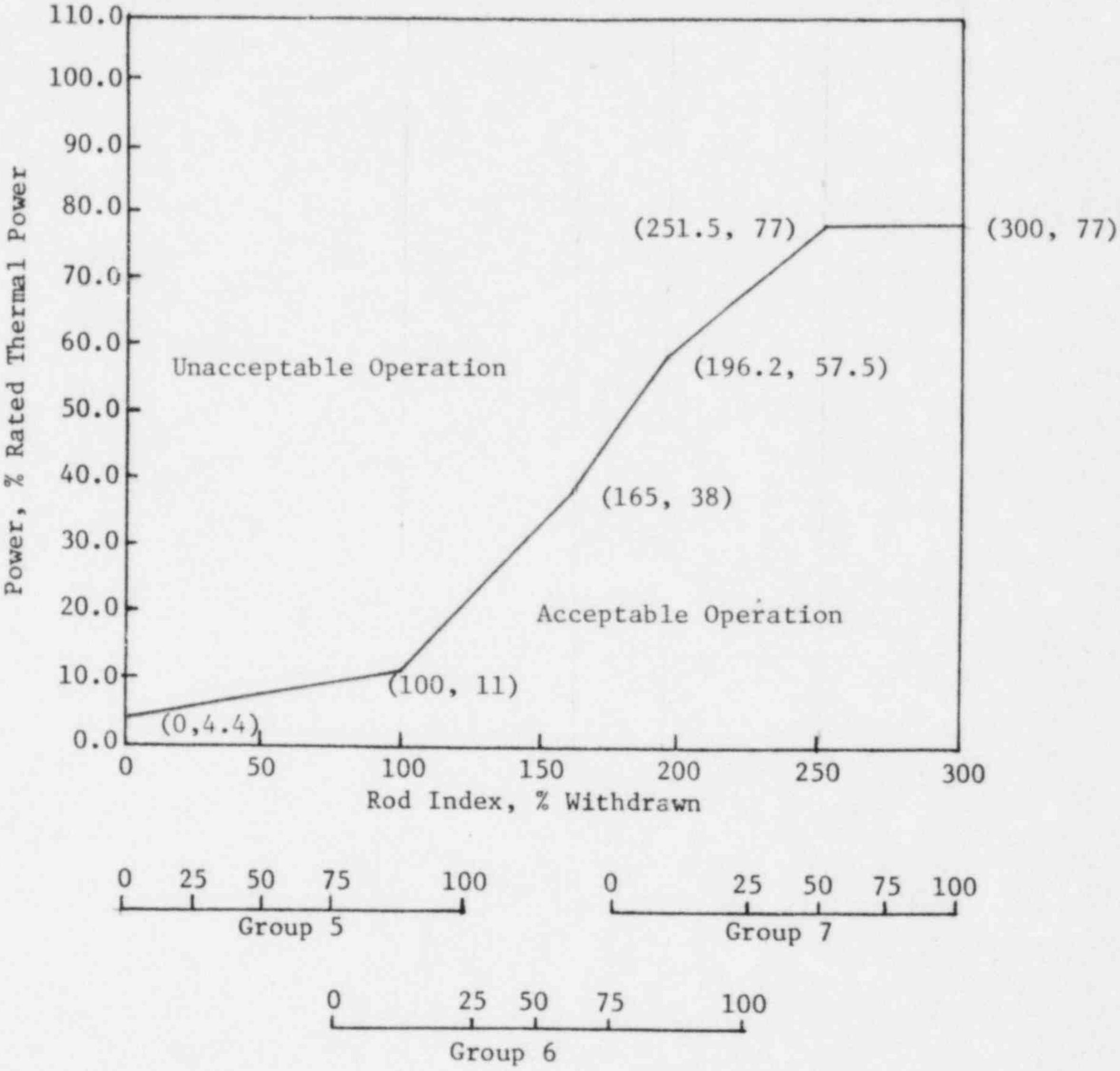


FIGURE 3.1-4a

REGULATING ROD GROUP INSERTION LIMITS FOR
THREE PUMP OPERATION AFTER 399 ± 10 EFPD

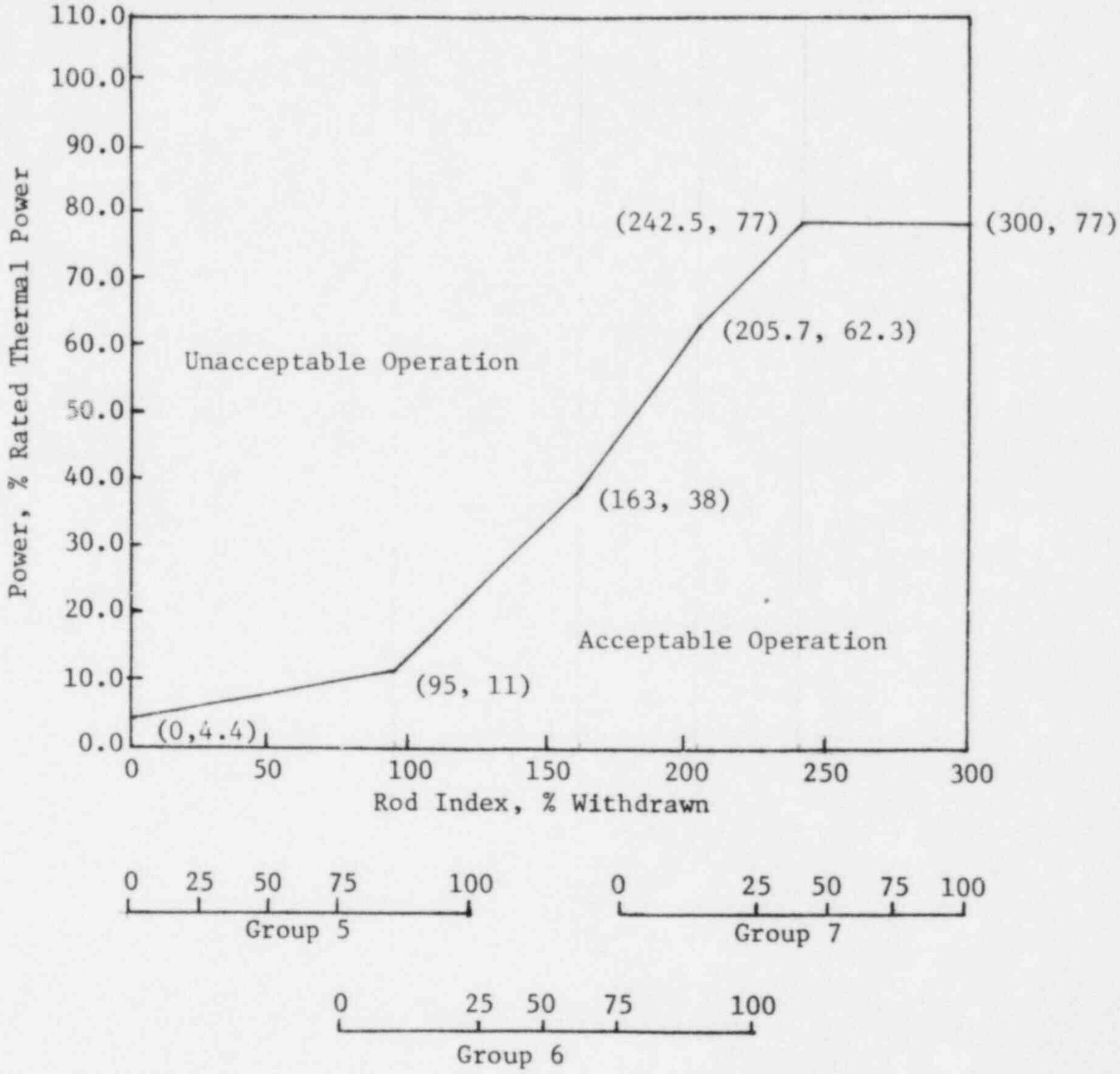
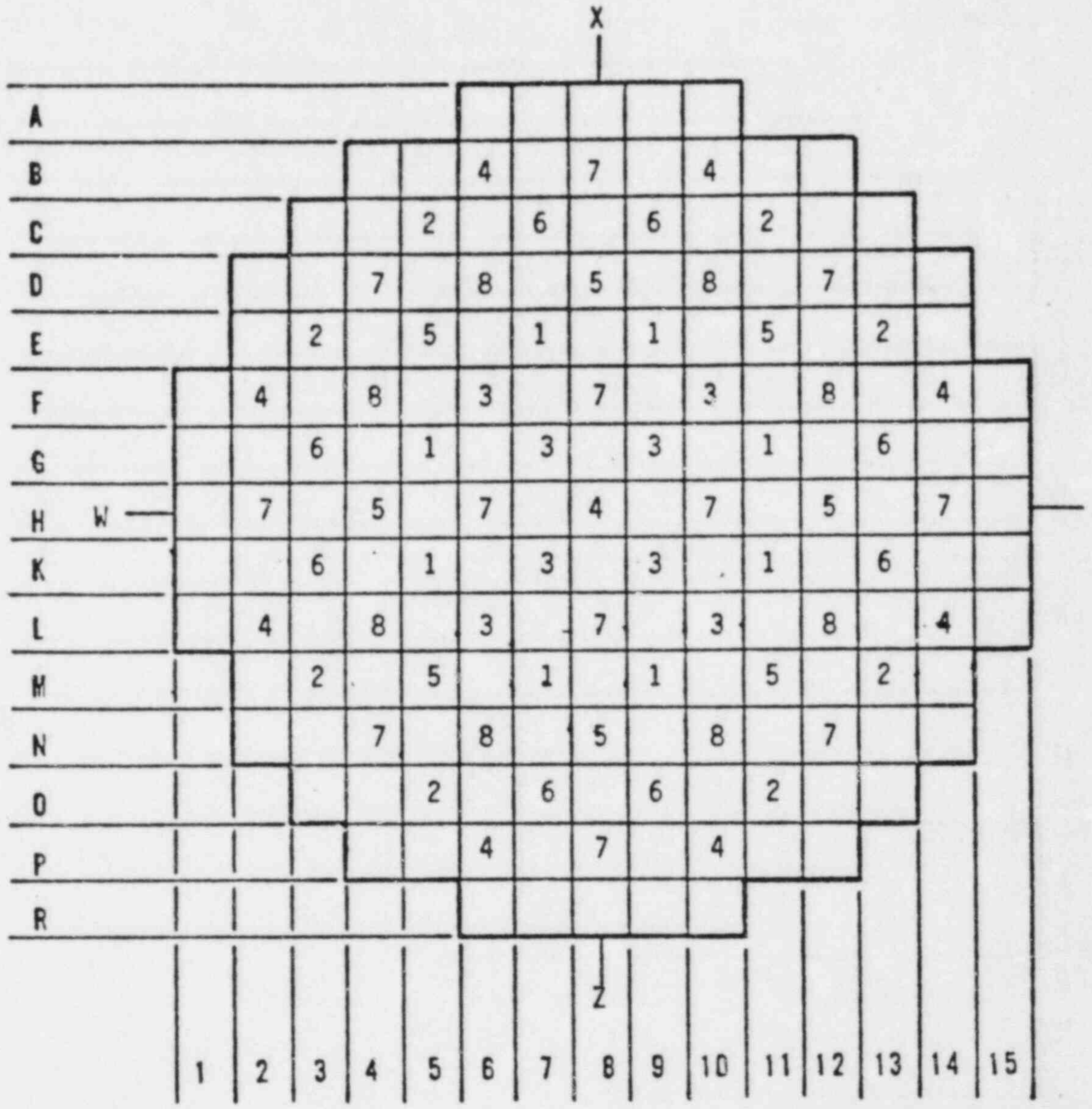


FIGURE 3.1-7

CONTROL ROD LOCATIONS AND GROUP DESIGNATIONS
FOR CRYSTAL RIVER 3, CYCLE 5



Group	No. of Rods	Function
1	8	Safety
2	8	Safety
3	8	Safety
4	9	Safety
5	8	Control
6	8	Control
7	12	Control
8	8	APSRs
	Total 69	

[x] Group Number

FIGURE 3.1-9

AXIAL POWER SHAPING ROD GROUP INSERTION
LIMITS FROM 0 TO 30 (+10/-0) EFPD

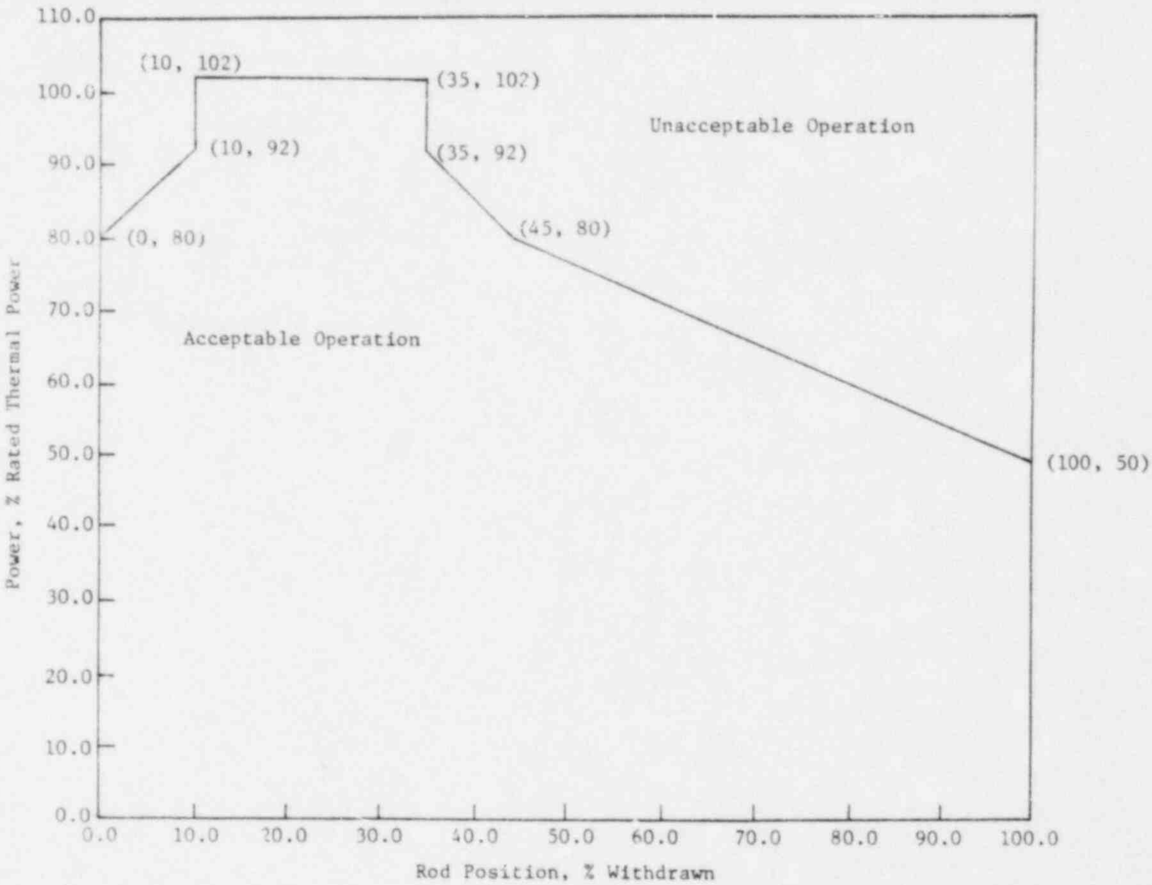


FIGURE 3.1-9a

AXIAL POWER SHAPING ROD GROUP INSERTION
LIMITS FOR 30 (+10/-0) TO 250 ± 10 EFPD

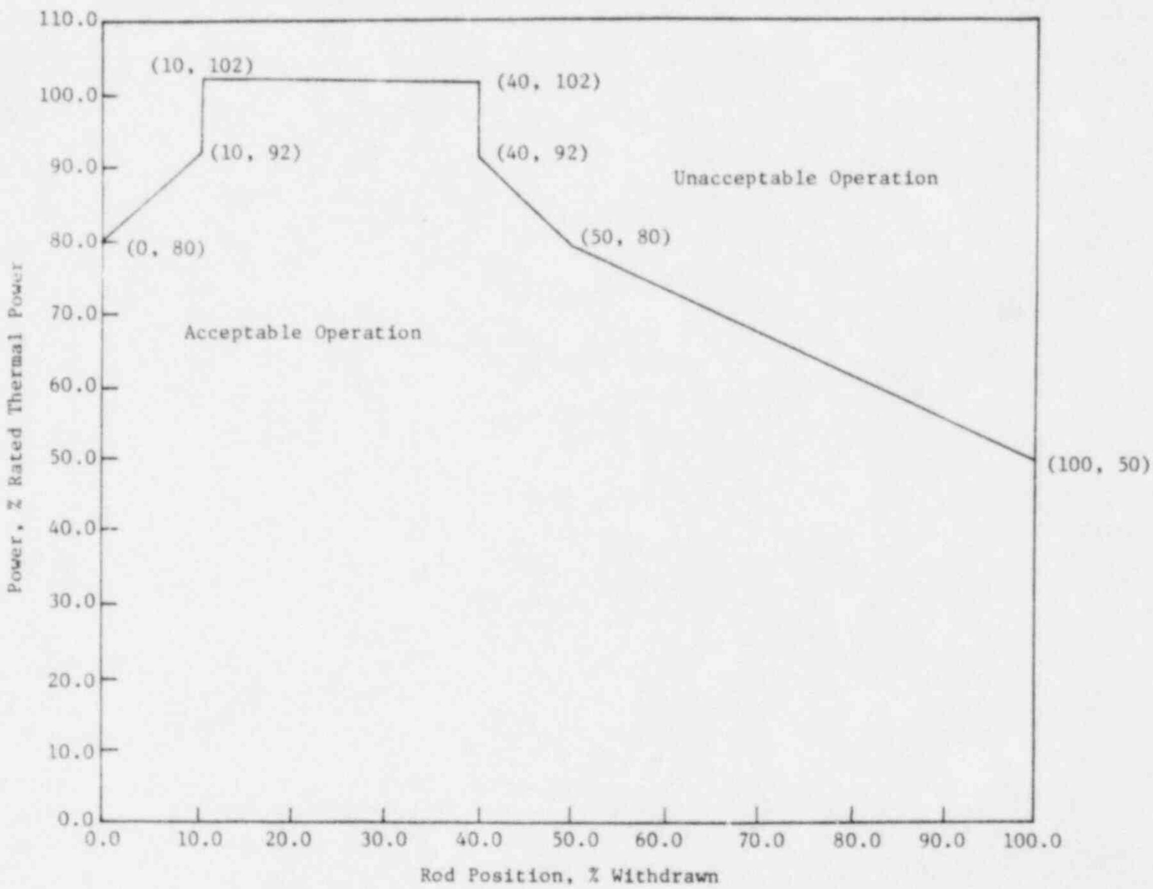


FIGURE 3.1-10

AXIAL POWER SHAPING ROD GROUP INSERTION
LIMITS FOR 250 ± 10 TO 399 ± 10 EFPD

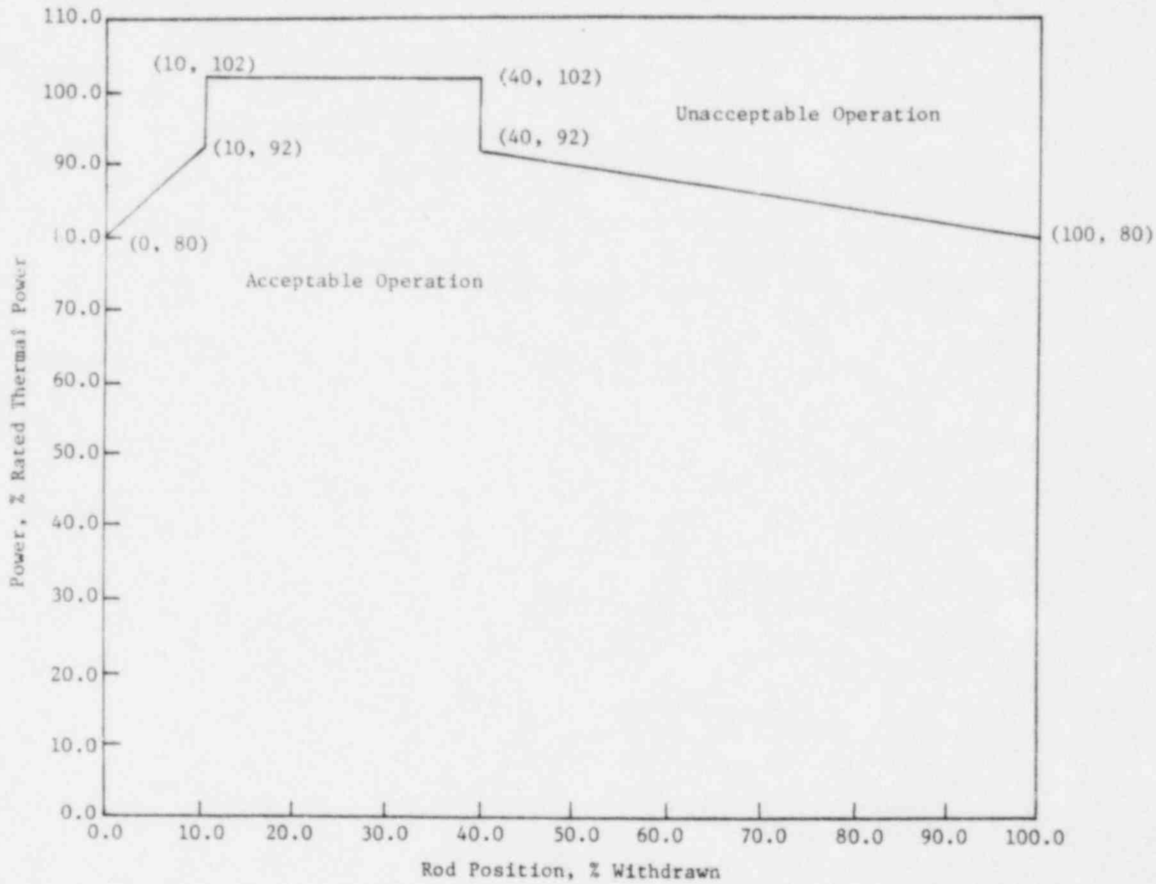


FIGURE 3.2-1

AXIAL POWER IMBALANCE ENVELOPE FOR
OPERATION FROM 0 TO 30 (+10/-0) EFPD

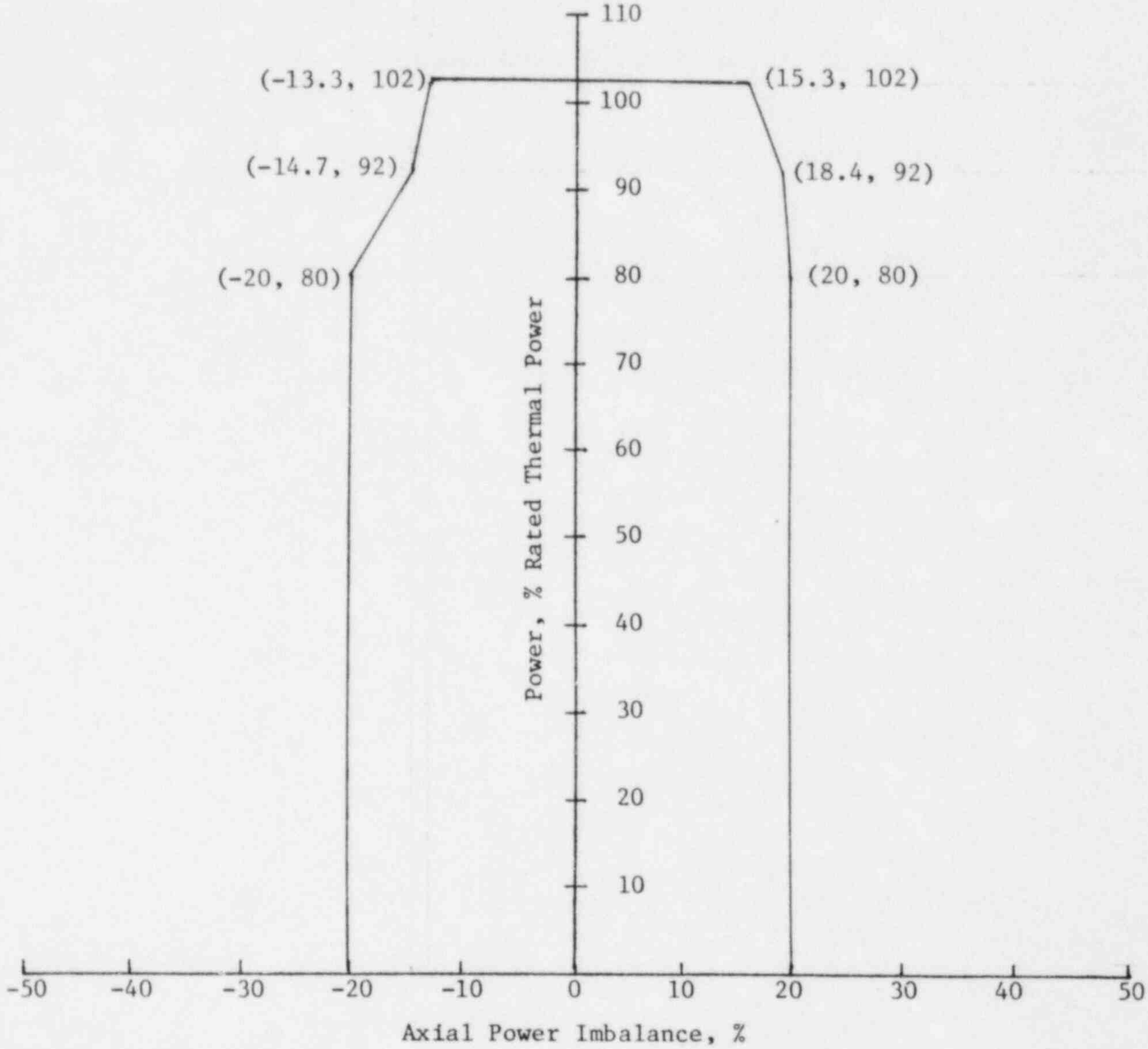


FIGURE 3.2-1a

AXIAL POWER IMBALANCE ENVELOPE FOR
OPERATION FROM 30 (+10/-0) TO 250 ± 10 EFPD

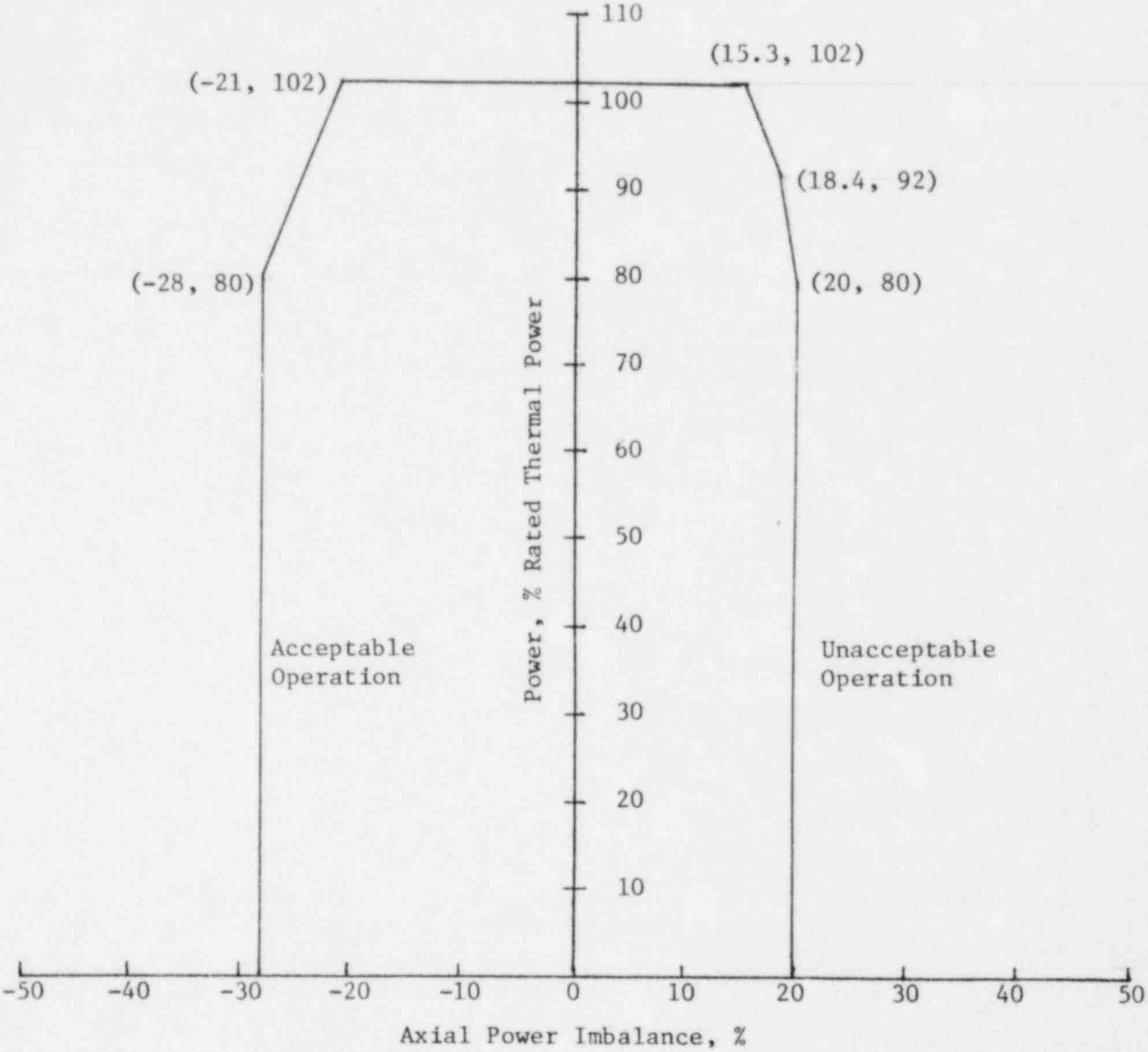


FIGURE 3.2-2

AXIAL POWER IMBALANCE ENVELOPE FOR OPERATION AFTER 250 ± 10 EFPD

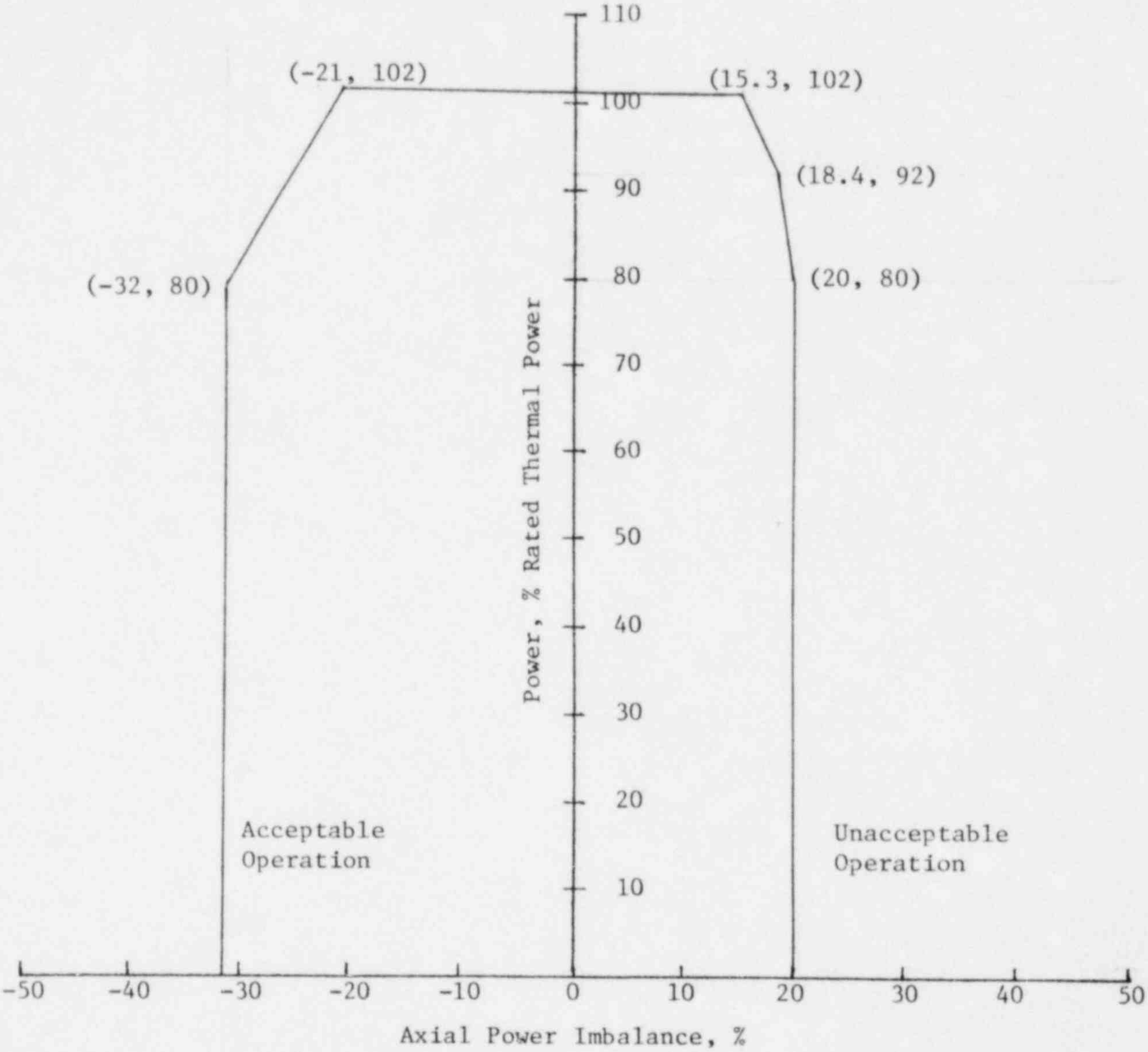


TABLE 3.3-2

REACTOR PROTECTION SYSTEM INSTRUMENTATION RESPONSE TIMES

	Functional Unit	Response Times
1.	Manual Reactor Trip	Not Applicable
2.	Nuclear Overpower *	$\leqq$ 0.266 seconds
3.	RCS Outlet Temperature - High	Not Applicable
4.	Nuclear Overpower Based on RCS Flow and AXIAL POWER IMBALANCE *	$\leqq$ 1.79 seconds
5.	RCS Pressure - Low	$\leqq$ 0.44 seconds
6.	RCS Pressure - High	$\leqq$ 0.44 seconds
7.	Variable Low RCS Pressure	Not Applicable
8.	Pump Status Based on RCPPMs*	$\leqq$ 1.5 seconds
9.	Reactor Containment Pressure - High	Not Applicable

* Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant system average temperature less than 525%°F. This limitation is required to ensure that (1) the moderator temperature coefficient is within its analyzed temperature range, (2) the protective instrumentation is within its normal operating range, (3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and (4) the reactor pressure vessel is above its minimum RT_{NDT} temperature.

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include (1) borated water sources, (2) makeup or DHR pumps, (3) separate flow paths, (4) boric acid pumps, (5) associated heat tracing systems, and (6) an emergency power supply from OPERABLE emergency busses.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective-action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions of 3.0% Δ k/k after xenon decay and cooldown to 200°F. The maximum boration capability requirement occurs from full power equilibrium xenon conditions and requires either 6356 gallons of 11,600 ppm boric acid solution from the boric acid storage tanks or 43,478 gallons of 2,270 ppm borated water from the borated water storage tank.

The requirements for a minumum contained volume of 415,200 gallons of borated water in the borated water storage tank ensures the capability for borating the RCS to the desired level. The specified quantity of borated water is consistent with the ECCS requirements of Specification 3.5.4. Therefore, the larger volume of borated water is specified.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 3.0%Δk/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 300 gallons of 11,600 ppm boron from the boric acid storage system or 1,608 gallons of 2,270 ppm boron from the borated water storage tank. To envelop future cycle BWST contained borated water volume requirements, a minimum volume of 13,500 gallons is specified.

ATTACHMENT D: TWO YEAR CYCLE IMPACT

I. CHANGE REQUEST

Proposed Changes

On pages 1-8, 3/4 3-9 and 3/4 7-35 change "18 months" to "24 months".

On those pages listed in item II, change "18 months" to "refueling cycle". Additionally, where the signs $\leq$ or $\geq$ appear, spell out the inequality rather than print the symbol.

Reasons for Proposed Changes

This change will update the Crystal River Unit 3 Technical Specifications to reflect a potential fuel cycle length of two years instead of 18 months. More importantly, this change will delete the necessity to perform a mid-cycle shutdown to perform the 18 month surveillances during the 2 year refuel cycle.

Safety Analysis

Although this change does change the recommended surveillance frequency, this will not degrade plant safety. Daily, Monthly, Quarterly, etc., surveillances are performed on much of the equipment for which the 18 month surveillance is lengthened.

If the surveillance frequency was not lengthened, a mid-cycle shutdown would be necessary to perform the surveillance, since most of the affected surveillances cannot be performed during normal operation. Plant shutdown only to perform surveillance is not practical from a safety or operating standpoint as it introduces unnecessary transients and non-operation time.

A two year surveillance frequency should not decrease the reliability of equipment because other periodic surveillances are still being performed.

ATTACHMENT D: TWO YEAR CYCLE IMPACT

II. TECHNICAL SPECIFICATION PAGES

Technical Specification No.	Page
Table 1.2	1-8
3.1.3.1	3/4 1-23
3.2.5	3/4 2-12
3.3.1.1	3/4 3-1
Table 4.3-1 (Continued)	3/4 3-8
3.3.2.1	3/4 3-9
3.3.3.2	3/4 3-27
3.4.3.2 (Att. E. IV)	3/4 4-4a
3.4.4	3/4 4-5
3.4.6.1	3/4 4-14
3.4.10	3/4 4-32
3.5.1	3/4 5-2
3.5.2	3/4 5-4
3.5.2	3/4 5-5
3.6.2.1	3/4 6-10
3.6.2.1	3/4 6-11
3.6.2.2 (Att. E. I)	3/4 6-13
3.6.2.3	3/4 6-14
3.6.3.1	3/4 6-16
3.6.4.2	3/4 6-23
3.7.1.2 (Att. E. V)	3/4 7-5
3.7.3.1	3/4 7-14
3.7.3.2	3/4 7-15
3.7.4.1	3/4 7-16
3.7.4.2	3/4 7-17
3.7.7.1	3/4 7-20
3.7.7.1	3/4 7-21
3.7.8.1	3/4 7-23
3.7.8.1	3/4 7-24
3.7.9.1	3/4 7-26
Table 4.7-4	3/4 7-35
3.7.11.1	3/4 7-39
3.7.11.1	3/4 7-40
3.7.11.2	3/4 7-41
3.7.11.3	3/4 7-44
3.7.11.4	3/4 7-45
3.7.12	3/4 7-47
3.8.1.1	3/4 8-2
3.8.1.1	3/4 8-3
3.8.1.1	3/4 8-4
3.8.2.1	3/4 8-8
3.8.2.3	3/4 8-11

Those Technical Specification No.'s followed by brackets are not within this Attachment, but in the Attachment referenced in the brackets.

TABLE 1.2

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 12 hours.
D	At least once per 24 hours.
W	At least once per 7 days.
M	At least once per 31 days.
Q	At least once per 92 days.
SA	At least once per 6 months.
R	At least once per 24 months.
S/U	Prior to each reactor startup.
N.A.	Not applicable.

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.1 The individual safety and regulating rod drop time from the fully withdrawn position shall be less than or equal to 1.66 seconds from power interruption at the control rod drive breakers to 3/4 insertion (25% position) with:

a. T_{avg} greater than or equal to 525°F, and

b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With the drop time of any safety or regulating rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 and 2.

b. With the rod drop times within limits but determined with less than 4 reactor coolant pumps operating, operation may proceed provided that THERMAL POWER is restricted to less than or equal to the THERMAL POWER allowable for the reactor coolant pump combination operating at the time of rod drop time measurement.

SURVEILLANCE REQUIREMENTS

4.1.3.4 The rod drop time of safety and regulating rods shall be demonstrated through measurement prior to reactor criticality:

a. For all rods following each removal of the reactor vessel head,

b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and

c. At least once every Refueling Cycle.

DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

a. Reactor Coolant Hot Leg Temperature

b. Reactor Coolant Pressure

c. Reactor Coolant Flow Rate

APPLICABILITY: MODE 1

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5.1 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

4.2.5.2 The Reactor Coolant system total flow rate shall be determined to be within its limit by measurement at least once per Refueling Cycle.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the Reactor Protection System instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Table 3.3-2.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each Reactor Protection System instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The total bypass function shall be demonstrated OPERABLE at least once per Refueling Cycle during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limits at least once per Refueling Cycle. Each test shall include at least one channel per function such that all channels are tested at least once every N times 24 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column on Table 3.3-1.

TABLE 4.3-1 (Continued)

NOTATION

* - With any control rod drive trip breaker closed.

** - When Shutdown Bypass is actuated.

(1) - If not performed in previous 7 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER.

(3) - When THERMAL POWER (TP) is above 30% of RATED THERMAL POWER (RTP), compare out-of-core measured AXIAL POWER IMBALANCE (API_o) to incore measured AXIAL POWER IMBALANCE (API_I) as follows:

$$\frac{RTP}{TP} \left| (API_o - API_I) \right| = \text{Imbalance Error}$$

Recalibrate if the absolute value of the Imbalance Error is equal to or greater than 3.5%.

(4) - AXIAL POWER IMBALANCE and loop flow indications only.

(5) - Verify at least one decade overlap if not verified in previous 7 days.

(6) - Each train tested every other month.

(7) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(8) - Flow rate measurement sensors may be excluded from CHANNEL CALIBRATION. However, each flow measurement sensor shall be calibrated at least once per Refueling Cycle.

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4 and with RESPONSE TIMES as shown in Table 3.3-5.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint Value.

b. With an ESFAS instrumentation channel inoperable, take the action shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE at least once per Refueling Cycle during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit at least once per Refueling Cycle. Each test shall include at least one channel per function such that all channels are tested at least once every N times 24 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.3.2 The incore detector system shall be demonstrated OPERABLE:

a. By performance of a CHANNEL CHECK within 7 days prior to its use for measurement of the AXIAL POWER IMBALANCE or the QUADRANT POWER TILT.

b. At least once per Refueling Cycle by performance of a CHANNEL CALIBRATION which does not include the neutron detectors.

PRESSURIZER

LIMITING CONDITION FOR OPERATION

3.4.4 The pressurizer shall be OPERABLE with:

a. A steam bubble,

b. A water level between 40 and 290 inches, and

c. At least 126 kW of pressurizer heaters.

APPLICABILITY: MODES 1 and 2.

ACTION:

With the pressurizer inoperable, be in at least HOT STANDBY with the control rod drive trip breakers open within 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.4.1 The pressurizer shall be demonstrated OPERABLE by verifying pressurizer level to be within limits at least once per 12 hours.

4.4.4.2 The emergency power supply for the pressurizer heaters shall be demonstrated OPERABLE at least once per Refueling Cycle by manually transferring power from the normal to the emergency power supply and energizing the heaters.

SURVEILLANCE REQUIREMENTS (Cont. ued)

a. Containment atmosphere iodine monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3.

b. Containment sump level monitoring system-performance of CHANNEL CALIBRATION at least once per Refueling Cycle.

c. Containment atmosphere gaseous monitoring system-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3.

SURVEILLANCE REQUIREMENTS (Continued)

b. Each internal vent valve shall be demonstrated OPERABLE at least once per Refueling Cycle during shutdown, by:

1. Verifying through visual inspection that the valve body and valve disc exhibit no abnormal degradation,

2. Verifying the valve is not stuck in an open position, and

3. Verifying through manual actuation that the valve is fully open with a force less than or equal to 425 lbs (applied vertically upward).

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days and within 6 hours of each solution volume increase greater than or equal to 80 gallons by verifying the boron concentration of the tank solution.

c. At least once per 31 days by verifying that power to the isolation valve operator is removed by locking the breaker in the open position.

d. At least once per Refueling Cycle verifying that each core flooding tank isolation valve closed alarm actuates whenever each core flooding tank isolation valve is not fully open and the Reactor Coolant System pressure exceeds 750 psig.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suction during LOCA conditions. This visual inspection shall be performed:

   1. For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and

   2. Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.

c. By verifying the correct position of each mechanical position stop for the following HPI stop check valves prior to restoring the HPI system to OPERABLE status following periodic valve stroking or maintenance on the valves.

   1. MUV-2
   2. MUV-6
   3. MUV-10

d. By verifying that the flow switches for the following LPI throttle valves operate properly prior to restoring the LPI system to OPERABLE status following periodic valve stroking or maintenance on the valves.

   1. DHV-110
   2. DHV-111

e. At least once per Refueling Cycle by:

   1. Verifying automatic isolation and interlock action of the DHR system from the Reactor Coolant System when the Reactor Coolant System pressure is greater than or equal to 284 psig.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying the correct position of each mechanical position stop for each of the stop check valves listed in Specification 4.5.2.c.

3. Verifying that the flow switches for the throttle valves listed in Specification 4.5.2.d operate properly.

4. A visual inspection of the containment emergency sump which verifies that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

5. Verifying a total leak rate less than or equal to 6 gallons per hour for the LPI system at:

   a) Normal operating pressure or a hydrostatic test pressure of greater than or equal to 150 psig for those parts of the system downstream of the pump suction isolation valve, and

   b) Greater than or equal to 55 psig for the piping from the containment emergency sump isolation valve to the pump suction isolation valve.

f. At least once per Refueling Cycle, during shutdown, by

1. Verifying that each automatic valve in the flow path actuates to its correct position on a high pressure or low pressure safety injection test signal, as appropriate.

2. Verifying that each HPI and LPI pump test starts automatically upon receipt of a high pressure or low pressure safety injection test signal, as appropriate.

g. Following completion of HPI or LPI system modifications that could have altered system flow characteristics[1], by performance of a flow balance test during shutdown to confirm the following injection flow rates into the Reactor Coolant System:

HPI System - Single Pump	LPI System - Single Pump
Single pump flow rate greater than or equal to 500 gpm at 600 psig.	1. Injection Leg A - 2800 to 3100 gpm.
While injecting through 4 Injection Legs, the flow rate for all combinations of 3 Injection Legs greater than or equal to 350 gpm at 600 psig.	2. Injection Leg B - 2800 to 3100 gpm.

[1]Flow balance tests performed prior to complete installation of modifications are valid if performed with the system change that could alter flow characteristics in effect.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the BWST on a containment spray actuation signal and manually transferring suction to the containment sump.

APPLICABILITY: MODE 1, 2, 3, and 4

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable spray system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per Refueling Cycle, during shutdown, by:

   1. Verifying that each automatic valve in the flow path actuates to its correct position on a containment spray actuation test signal.

   2. Verifying that each spray pump starts automatically on a containment spray actuation test signal.

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per Refueling Cycle by verifying a total leak rate less than or equal to 6 gallons per hour for the system at:

   1. Normal operating pressure or a hydrostatic test pressure of greater than or equal to 190 psig for those parts of the system downstream of the pump suction isolation valve, and

   2. Greater than or equal to 55 psig for the piping from the containment emergency sump isolation valve to the pump suction isolation valve.

d. At least once per 5 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

CONTAINMENT COOLING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.3 At least two independent containment cooling units shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3

ACTION:

With one of the above required containment cooling units inoperable, restore at least two units to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 At least the above required cooling units shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

   1. Starting (unless already operating) each unit from the Control Room.

   2. Verifying that each unit operates for at least 15 minutes. and

   3. Verifying a cooling water flow rate of greater than or equal to 500 gpm to each unit cooler.

b. At least once per Refueling Cycle by verifying that each unit starts automatically on low speed upon receipt of a containment cooling actuation test signal.

SURVEILLANCE REQUIREMENTS (Continued)

4.6.3.1.2 Each isolation valve specified in Table 3.6-1 shall be demonstrated OPERABLE during the COLD SHUTDOWN or REFUELING MODE at least once per Refueling Cycle by:

a. Verifying that on a containment isolation test signal, each automatic isolation valve actuates to its isolation position.

b. Verifying that on a containment radiation-high test signal, each purge and exhaust automatic valve actuates to its isolation position.

HYDROGEN PURGE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.4.2 A containment hydrogen purge system shall be OPERABLE.

APPLICABILITY: MODES 1 and 2

ACTION:

With the containment hydrogen purge system inoperable, restore the hydrogen purge system to OPERABLE status within 30 days or be in as least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.6.4.2 The hydrogen purge system shall be demonstrated OPERABLE:

a. At least once per 31 days by initiating, from the Control Room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

b. At least once per Refueling Cycle or (1) after any structural maintenance on the HEPA filter or charcoal adsorbers housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:

   1. Verifying that the purge system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c*, and C.5.d* of Regulatory Guide 1.52, Revision 1, July 1976, and the system flow rate is greater than or equal to 1500 SCFM.

   2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.

* The air flow distribution test of Section 8 of ANSI N510-1975 may be performed downstream of the HEPA filters.

3/4.7.3 CLOSED CYCLE COOLING WATER SYSTEMS

NUCLEAR SERVICES CLOSED CYCLE COOLING SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1 The nuclear services closed cycle cooling system shall be OPERABLE and shall consist of a minimum of:

a. Two emergency nuclear services closed cycle cooling water pumps, each powered from a separate OPERABLE emergency bus, and

b. Three nuclear services heat exchangers.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one emergency nuclear service closed cycle cooling water pump OPERABLE or with only two nuclear services heat exchangers OPERABLE, restore a minimum of two pumps and three heat exchangers to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 The nuclear services closed cycle cooling system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per Refueling Cycle, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on an ESAS test signal.

2. Verifying that each emergency nuclear services closed cycle cooling water pump starts automatically upon receipt of an ESAS test signal.

DECAY HEAT CLOSED CYCLE COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.2 Two independent decay heat closed cycle cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one decay heat closed cycle cooling water loop OPERABLE, restore the inoperable loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.2 Each decay heat closed cycle cooling water loop shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (Manual, power operated or automatic) servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per Refueling Cycle, during shutdown, by:

   1. Verifying that each automatic valve in the flow path actuates to its correct position on an ESAS test signal

   2. Verifying that each decay heat closed cycle cooling water pump starts automatically upon receipt of an ESAS test signal.

3/4.7.4 SEA WATER SYSTEMS

NUCLEAR SERVICES SEA WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 At least two independent emergency nuclear services sea water pumps and the associated flow path shall be OPERABLE with each pump capable of being powered from separate OPERABLE emergency busses.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one emergency nuclear services sea water pump OPERABLE, restore the inoperable pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 The nuclear service sea water systems shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per Refueling Cycle, during shutdown, by verifying that each emergency nuclear services sea water pump starts automatically upon receipt of an ESAS signal.

DECAY HEAT SEA WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.2 Two independent decay heat sea water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only once decay heat sea water loop OPERABLE, restore the inoperable loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.2 Each decay heat water loop shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (Manual, power operated or automatic) servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per Refueling Cycle, during shutdown, by verifying that each decay heat seat water pump starts automatically upon receipt of an ESAS test signal.

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.7.1 Two independent control room emergency ventilation systems shall be OPERABLE.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one control room emergency ventilation system inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.7.1 Each control room emergency ventilation system shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the control room air temperature is less than or equal to 120°F.

b. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow throught the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

c. At least once per Refueling Cycle or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:

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* When the ventilation systems are determined to be inoperable solely because the control complex return duct radiation monitor (RM-A5) is inoperable, the systems may be considered OPERABLE for the purpose of satisfying the requirements of the LCO provided the requirements of Action 18 of Technical Specification 3.3.3.1 are complied with.

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that with the system operating at a flow rate of 43,500 cfm ± 10% and exhausting through the HEPA filters and charcoal adsorbers, the total bypass flow of the system to the facility vent, including leakage through the system diverting valves, is less than or equal to 1% when the system is tested by admitting cold DOP at the system intake.

2. Verifying that the ventilation system satisfies the inplace testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c* and C.5.d* of Regulatory Guide 1.52, Revision 1, July 1976, and the system flow rate is 43,500 cfm ± 10%.

3. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position of C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.

4. Verifying a system flow rate of 43,500 cfm ± 10% during system operation when tested in accordance with ANSI N510-1975.

d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.

e. At least once per Refueling Cycle by:

1. Verifying that the pressure drop across the combine HEPA filters and charcoal adsorber banks is less than 6 inches Water Gauge while operating the system at a flow rate of 43,500 cfm ± 10%

2. Verifying that on a containment isolation test signal, the system automatically switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks.

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* The air flow distribution test of Section 8 of ANSI N510-1975 may be performed downstream of the HEPA filters.

3/4.7.8 AUXILIARY BUILDING VENTILATION EXHAUST SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.8.1 The Auxiliary Building ventilation exhaust system shall be OPERABLE and shall consist of a minimum of two independent pairs of exhaust fans and four filter systems.[1]

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one pair of exhaust fans or one filter system inoperable, restore the inoperable pair of fans or system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.8.1 Each Auxiliary Building ventilation exhaust system shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS in initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

b. At least once per Refueling Cycle or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting. fire or chemical release in any ventilation zone communicating with the system by:

1. Verifying that the system operating at a flow rate of 156,680 cfm $\pm$ 10% and exhausting through the HEPA filters and charcoal adsorbers, the total bypass flow of the system to the facility vent, including leakage through the system diverting valves, is less than or equal to 1% when the system is tested by admitting cold DOP at the system intake.

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[1] More than one filter system and more than one pair of exhaust fans may be inoperable for up to 12 hours for surveillance testing per Specification 4.7.8.1.b, e, or f.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the ventilation system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c[2], and C.5.d[2] of Regulatory Guide 1.52, revision 1, July 1976, and the system flow rate is 156,680 cfm ± 10%.

3. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position of C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.

4. Verifying a system flow rate of 156,680 cfm ± 10% during system operation when tested in accordance with ANSI N510-1975.

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.[3]

d. At least once per Refueling Cycle by verifying that the pressure drop across the combine HEPA filters and charcoal adsorber banks is less than 6 inches Water Gauge while operating the system at a flow rate of 156,680 cfm ± 10%.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975[2] while operating the system at a flow rate of 39,170 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975[2] while operating the system at a flow rate of 39,170 cfm ± 10%.

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2 The air flow distribution test, Section 8 of ANSI N510-1975, may be performed downstream of the HEPA filters.

3 The laboratory test of Table 3 for a representative sample of used activated carbon shall be per Test 5b in Table 2 at a relative humidity of 70% for a methyl iodide removal efficiency of greater than or equal to 95%.

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per Refueling Cycle during shutdown a representative sample of at least 10 hydraulic snubbers or at least 10% of all snubbers listed in Table 3.7-3, whichever is less, shall be selected and functionally tested to verify correct piston movement, lock up and bleed. Snubbers greater than 50,000 lbs capacity may be excluded from functional testing requirements. Snubbers selected for functional testing shall be selected on a rotating basis. Snubbers identified in Table 3.7-3 as either "Especially Difficult to Remove" or in "High Radiation Zones" may be exempted from functional testing provided these snubbers were demonstrated OPERABLE during previous functional tests. Snubbers found inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each snubber found inoperable during these functional tests, an additional minimum of 10% of all snubbers or 10 snubbers, whichever is less, shall also be functionally tested until no more failures are found or all snubbers have been functionally tested.

TABLE 4.7-4

HYDRAULIC SNUBBER INSPECTION SCHEDULE

NUMBER OF SNUBBERS FOUND INOPERABLE DURING INSPECTION OR DURING INSPECTION INTERVAL*	NEXT REQUIRED INSPECTION INTERVAL**
0	24 months ± 25%
1	12 months ± 25%
2	6 months ± 25%
3 or 4	124 days ± 25%
5, 6, or 7	62 days ± 25%
Greater than or equal to 8	31 days ± 25%

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* Snubbers may be categorized into two groups, "accessible" and "inaccessible". This categorization shall be based upon the snubber's accessibility for inspection during reactor operation. These two groups may be inspected independently according to the above schedule.

** The required inspection interval shall not be lengthened more than one step at a time. Following the 1981 refueling outage, the required inspection interval for snubbers inside containment is 12 months ± 25%. Subsequent intervals shall be determined by the above Table.

SURVEILLANCE REQUIREMENTS

4.7.11.1 The fire suppression water system shall be demonstrated OPERABLE:

a. At least once per 7 days be verifying the contained water supply volume.

b. At least once per 31 days on a STAGGERED TEST BASIS by starting each pump and operating it for at least 15 minutes on recirculation flow.

c. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path is in its correct position.

d. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

e. At least once per Refueling Cycle by performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence, and:

1. Verifying that each automatic valve in the flow path actuates to its correct position,

2. Verifying that each pump develops at least 2000 gpm at a discharge pressure of greater than or equal to 115 psig,

3. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel, and

4. Verifying that each high pressure pump starts (sequentially) to maintain the fire suppression water system pressure greater than or equal to 70 psig.

f. At least once per 3 years by performing flow tests of the system in accordance with Chapter 5, Section 11 of Fire Protection handbook, 14th Edition (January 1976) published by National Fire Protection Association.

SURVEILLANCE REQUIREMENTS (Continued)

g. By demonstrating the fire pump diesel engines OPERABLE:

1. At least once per 31 days by verifying:

(a) The fuel storage tank contains at least 175 gallons of fuel, and

(b) The diesel starts from ambient conditions and operates for at least 20 minutes.

2. At least once per 92 days by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-65, is within the acceptable limits specified in Table 1 of ASTM-D975-74 with respect to viscosity, water content and sediment for the type of fuel specified for use in the diesels.

3. At least once per Refueling Cycle, during shutdown, by:

(a) Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service, and

(b) Verifying the diesel starts from ambient conditions on the auto-start signal and operates for greater than or equal to 20 minutes while loaded with the fire pump.

h. By demonstrating the fire pump diesel starting 24-volt battery banks and chargers OPERABLE:

1. At least once per 7 days by verifying that:

(a) The electrolyte level of each battery is above the plates, and

(b) The overall battery voltage is greater than or equal to 24 volts.

2. At least once per 92 days by verifying that the specific gravity is appropriate for continued service of the battery.

3. At least once per Refueling Cycle by verifying that:

(a) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, and

(b) The battery-to-battery and terminal connections are clear, tight, free of corrosion and coated with anti-corrosion material.

DELUGE AND SPRINKLER SYSTEMS

LIMITING CONDITION FOR OPERATION

3.7.11.2 The deluge and sprinkler systems shown in Table 3.7-4 shall be OPERABLE.

APPLICABILITY: Whenever equipment in the deluge/sprinkler protected areas is required to be OPERABLE.

ACTION:

a. With one or more of the above required deluge and sprinkler systems inoperable, establish a continuous fire watch with backup fire suppression equipment for the unprotected area(s) within 1 hour; restore the system to OPERABLE status with 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.11.2 Each of the above required deluge and sprinkler systems shall be demonstrated OPERABLE:

a. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

b. At least once per Refueling Cycle:

1. By performing a system functional test which includes simulated automatic actuation of the system, and:

(a) Verifying that the automatic valves in the flow path actuate to their correct positions.

HALON SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.11.3 The Halon system in the Cable Spreading room (Control Complex, Elevation 134'0") shall be OPERABLE with the storage tanks having at least 95% of full charge weight and 90% of full charge pressure.

APPLICABILITY: At all times.

ACTION:

a. With the above required Halon system inoperable, establish a continuous fire watch with backup fire suppression equipment for the unprotected area(s) within 1 hour; restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.11.3 The Halon system shall be demonstrated OPERABLE:

a. At least once per 6 months by verifying each Halon storage tank weight and pressure.

b. At least once per Refueling Cycle by

   1. Verifying the system, including associated ventilation dampers, would actuate automatically to a simulated test signal.

   2. Verifying the OPERABILITY of the manual initiating system.

   3. Performance of a flow test through headers and nozzles to assure no blockage.

FIRE HOSE STATIONS

LIMITING CONDITION FOR OPERATION

3.7.11.4 The fire hose stations shown in Table 3.7-5 shall be OPERABLE.

APPLICABILITY: Whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE.

ACTION:

a. With one or more of the fire hose stations shown in Table 3.7-5 inoperable, route an equivalent capacity fire hose to the unprotected area(s) from an OPERABLE hose station within 1 hour.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.11.4 Each of the fire hose stations shown in Table 3.7-5 shall be demonstrated OPERABLE:

a. At least once per 31 days by:

    1. Visual inspection of the station to assure all required equipment is at the station, and

b. At least once per Refueling Cycle by:

    1. Removing the hose for inspection and re-racking, and

    2. Replacement of all degraded gaskets in couplings.

c. At least once per 3 years by:

    1. Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage.

    2. Conducting a hose hydrostatic test at a pressure at least 50 psig greater than the maximum pressure available at that hose station.

3/4.7.12 PENETRATION FIRE BARRIERS

LIMITING CONDITION FOR OPERATION

3.7.12 All penetration fire barriers protecting safety related areas shall be functional.

APPLICABILITY: At all times.

ACTION:

a. With one or more of the above required penetration fire barriers non-functional, establish a continuous fire watch on at least one side of the affected penetration within 1 hour.

b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.12 Each of the above required penetration fire barriers shall be verified to be functional by visual inspection;

a. At least once per Refueling Cycle, and

b. Prior to declaring a penetration fire barrier functional following repairs or maintenance.

ACTION (Continued)

c. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of two diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter, unless the diesel generators are already operating; restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each independent circuit between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying;

   1. Correct breaker alignments and indicated power availability, and

   2. That the sump pumps in the tunnel containing the DC control feeds to the 230kv switchyard are OPERABLE.

b. Demonstrated OPERABLE at least once per Refueling Cycle during shutdown by transferrring unit power supply from the normal circuit to the alternate circuit.

SURVEILLANCE REQUIREMENTS (Continued)

c. Demonstrated OPERABLE by determining that each battery supplying DC control power to the 230kv switchyard breakers is OPERABLE;

1. At least once per 7 days by verifying that:

   (a) The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,

   (b) The pilot cell specific gravity, corrected to $77^{\circ}F$, and full electrolyte level is greater than or equal to 1.20.

   (c) The pilot cell voltage is greater than or equal to 2.15 volts, and

   (d) The overall battery voltage is greater than or equal to 120 volts.

2. At least once per 92 days by verifying that:

   (a) The voltage of each connected cell is greater than or equal to 2.15 volts under float charge and has not decreased more than 0.10 volts from the value observed during the baseline tests, and

   (b) The specific gravity, corrected to $77^{\circ}F$, and full electrolyte level of each connected cell is greater than or equal to 1.20 and has not decreased more than 0.01 from the value observed during the previous tests, and

   (c) The electrolyte level of each connected cell is between the minimum and maximum level indication marks.

3. At least once per Refueling Cycle, by verifying that:

   (a) The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.

   (b) The cell-to-cell and terminal connections are clean, tight and coated with anti-corrosion materials,

   (c) The battery charger will supply at least 95 amperes at 125 volts for at least 2 hours.

SURVEILLANCE REQUIREMENTS (Continued)

4 At least once per Refueling Cycle, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for 1 hour when the battery is subjected to a battery service test.

5 At least once per 60 months, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day fuel tank,

2. Verifying the fuel level in the fuel storage tank,

3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

4. Verifying the diesel starts from ambient condition and accelerates to at least 900 rmp in less than or equal to 10 seconds,

5. Verifying the generator is synchronized, loaded to greater than or equal to 1500 kw, and operates for greater than or equal to 60 minutes, and

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. At least once each 92 days by verifying that a sample of diesel fuel from the fuel storage tank is within the acceptable limits specified in Table 1 of ASTM D975-68 when checked for viscosity, water and sediment.

c. At least once per Refueling Cycle, during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

SURVEILLANCE REQUIREMENTS (Continued)

4.8.2.1.2 The transformers capable of powering vital busses shall be demonstrated OPERABLE at least once per Refueling Cycle and within 24 hours after entering ACTION b. above.

SURVEILLANCE REQUIREMENTS (Continued)

2. The pilot cell specific gravity, corrected to 77°F, and full electrolyte level is greater than or equal to 1.20.

3. The pilot cell voltage is greater than or equal to 2.15 volts, and

4. The overall battery voltage is greater than or equal to 240/120 volts.

b. At least once per 92 days by verifying that:

1. The voltage of each connected cell is greater than or equal to 2.15 volts under float charge and has not decreased more than 0.10 volts from the value observed during the original acceptance test, and

2. The specific gravity, corrected to 77°F, and full electrolyte level of each connected cell is greater than equal to 1.20 and has not decreased more than 0.01 from the value observed during the previous test, and

3. The electrolyte level of each connected cell is between the minimum and maximum level indication marks.

c. At least once per 18 months by verifying that:

(a) The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.

(b) The cell-to-cell and terminal connections are clean, tight and coated with anti-corrosion materials,

(c) The battery charger will supply at least 190 amperes at 120 volts for at least 8 hours.

d. At least once per Refueling Cycle, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for 2 hours when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test.

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CRYSTAL RIVER UNIT 3

— Cycle 5 Reload Report —

Babcock & Wilcox
a McDermott company