UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-423

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 164
License No. NPF-49

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Northeast Nuclear Energy Company, et al. (the licensee) dated May 9, 1997, as supplemented August 4, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Facility Operating License and Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 164, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

In addition, paragraph 2.C.(5) of Facility Operating License No. NPF-49 is amended to read as follows:

(5) The Additional Conditions contained in Appendix C, as revised through Amendment No. 164, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the additional conditions.

3. This license amendment is effective as of the date of issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

William M. Dean, Director
Millstone Project Directorate
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License
and Technical Specifications

Date of Issuance: October 21, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 164

FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

Replace the following page of the Facility Operating License with the attached page. The revised page is identified by amendment number and contains a vertical line indicating the area of change.

| Remove | Insert |
|---|---|
| Appendix C | Appendix C |

Replace the following pages of the Appendix A, Technical Specifications, with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

| Remove | Insert |
|---|---|
| vii | vii |
| xiii | xiii |
| 3/4 1-3 | 3/4 1-3 |
| 3/4 1-4 | 3/4 1-4 |
| 3/4 1-5 | 3/4 1-5 |
| 3/4 1-6 | 3/4 1-6 |
| 3/4 1-7 | 3/4 1-7 |
| 3/4 1-8 | 3/4 1-8 |
| 3/4 1-9 | 3/4 1-9 |
| 3/4 3-4 | 3/4 3-4 |
| 3/4 3-5 | 3/4 3-5 |
| 3/4 3-6 | 3/4 3-6 |
| 3/4 3-12 | 3/4 3-12 |
| 3/4 3-14 | 3/4 3-14 |
| - | 3/4 3-82 |
| - | 3/4 3-83 |
| B 3/4 1-3 | B 3/4 1-3 |
| B 3/4 3-3 | B 3/4 3-3 |
| B 3/4 3-3a | - |
| B 3/4 3-3b | - |
| - | B 3/4 3-7 |
| - | B 3/4 3-8 |
| - | B 3/4 3-9 |
| 6-20a | 6-20a |

APPENDIX C

ADDITIONAL CONDITIONS
OPERATING LICENSE NO. NPF-49

Northeast Nuclear Energy Company (NNECO) shall comply with the following conditions on the schedules noted below:

| Amendment Number | Additional Condition | Condition Completion Date |
|---|---|---|
| 162 | Millstone Unit No. 3 will incorporate the changes into the Final Safety Analysis Report (FSAR) as requested by letter dated January 22, 1998, as supplemented by letter dated July 17, 1998, that accepts the use of epoxy coatings on service water system components. Future changes to the design described in this submittal may be made in accordance with the provisions of 10 CFR 50.59. | During the next revision of the FSAR required by 10 CFR 50.71(e) or no later than June 30, 1999. |
| 164 | Millstone Unit No. 3 will incorporate into Technical Specification 6.9.1.6, references to the shutdown margin analysis methods reviewed and approved by the NRC. | To be submitted to the NRC within 90 days from October 21, 1998. |

INDEX

**BASES**

## 3/4.1 REACTIVITY CONTROL SYSTEMS

### 3/4.1.1 BORATION CONTROL

### SHUTDOWN MARGIN - MODES 3, 4 AND 5 LOOPS FILLED

**LIMITING CONDITION FOR OPERATION**

3.1.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to the limits shown in Figures 3.1-1, 3.1-3 and 3.1-4 for four loop operation and in Figure 3.1-2 for three loop operation.*

APPLICABILITY: MODES 3, 4 and 5

ACTION:

With the SHUTDOWN MARGIN less than the required value, immediately initiate and continue boration at greater than or equal to 33 gpm of a solution containing greater than or equal to 6600 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

**SURVEILLANCE REQUIREMENTS**

4.1.1.1.2.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to the required value:

a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s); and

b. At least once per 24 hours by consideration of the following factors:

1) Reactor Coolant System boron concentration,

2) Control rod position,

3) Reactor Coolant System average temperature,

4) Fuel burnup based on gross thermal energy generation,

5) Xenon concentration, and

6) Samarium concentration.

4.1.1.1.2.2 Valve 3CHS-V305 shall be verified closed and locked at least once per 31 days.

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*Additional SHUTDOWN MARGIN requirements, if required, are given in Specification 3.3.5.

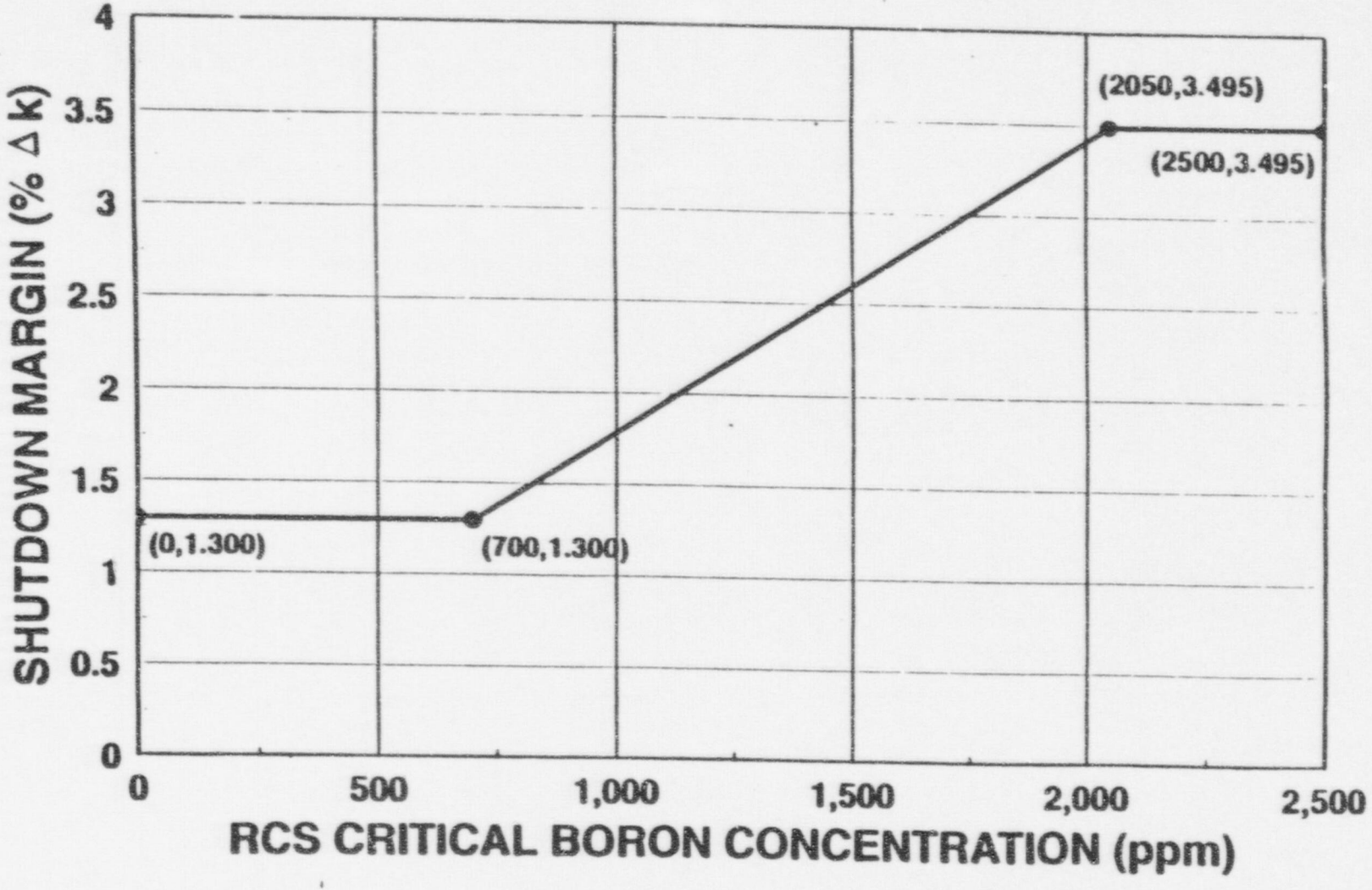


FIGURE 3.1-1

REQUIRED SHUTDOWN FOR MODE 3 WITH FOUR LOOPS IN OPERATION

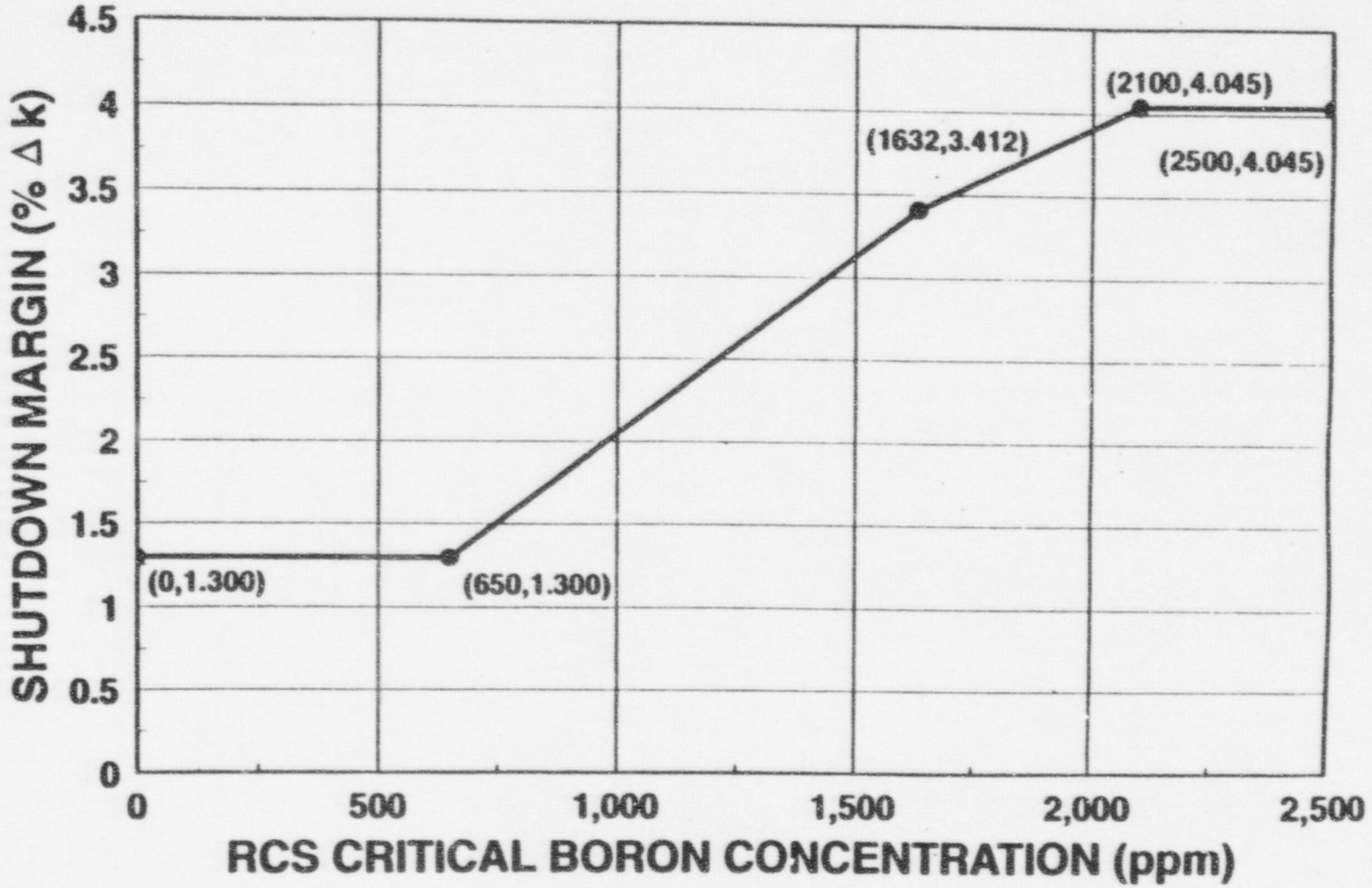


FIGURE 3.1-2

REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH THREE LOOPS IN OPERATION

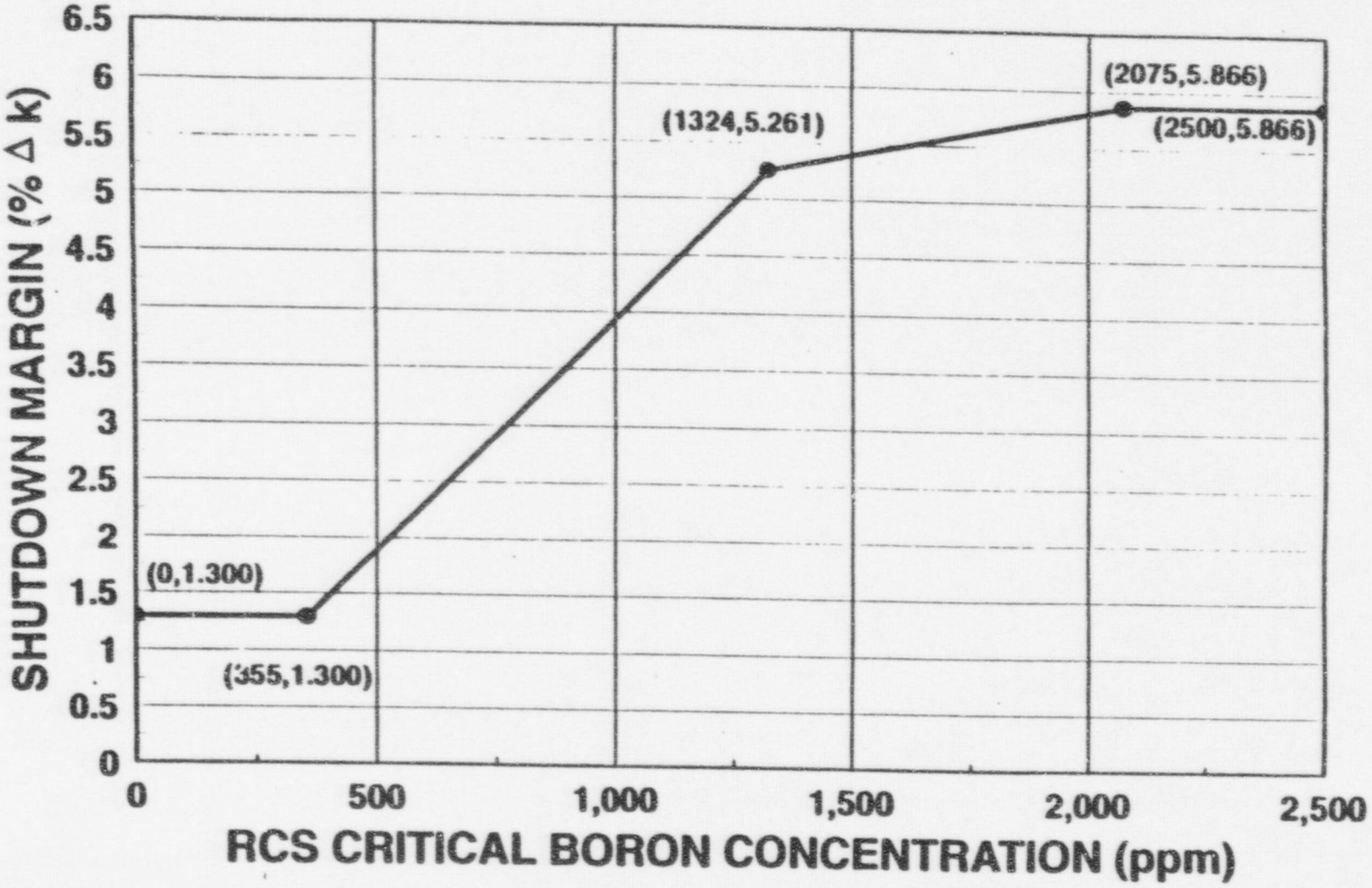


FIGURE 3.1-3

REQUIRED SHUTDOWN MARGIN FOR MODE 4

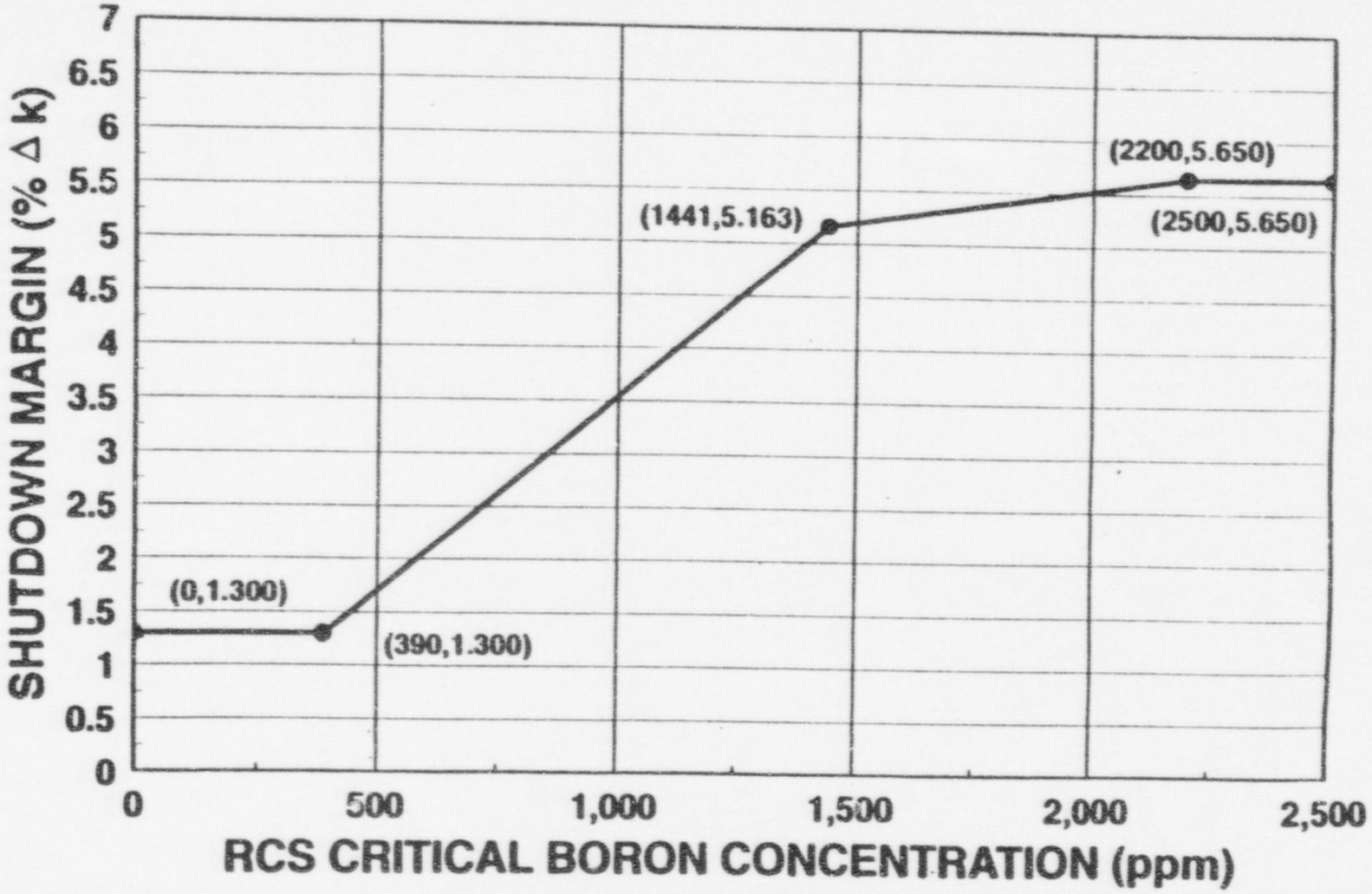


FIGURE 3.1-4

REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS FILLED

## SHUTDOWN MARGIN - COLD SHUTDOWN - LOOPS NOT FILLED

### LIMITING CONDITION FOR OPERATION

3.1.1.2 The SHUTDOWN MARGIN shall be greater than or equal to

a) the limits shown in Figure 3.1-5* or

b) the limits shown in Figure 3.1-4*, witn the chemical and volume control system (CVCS) aligned to preclude reactor coolant system boron concentration reduction.

APPLICABILITY: MODE 5 LOOPS NOT FILLED

ACTION:

a. With the SHUTDOWN MARGIN less than the above, immediately initiate and continue boration at greater than or equal to 33 gpm of a solution containing greater than or equal to 6600 ppm boron or equivalent until the required SHUTDOWN MARGIN is restored.

b. With the CVCS dilution flow paths not closed and secured in position in accordance with Specification 3.1.1.2(b), immediately close and secure the paths or meet the limits shown in Figure 3.1-5.

### SURVEILLANCE REQUIREMENTS

4.1.1.2.1 The SHUTDOWN MARGIN shall be determined to be greater than or equal to the above:

a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s); and

b. At least once per 24 hours by consideration of the following factors:

1) Reactor Coolant System boron concentration,

2) Control rod position,

3) Reactor Coolant System average temperature,

4) Fuel burnup based on gross thermal energy generation,

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*Additional SHUTDOWN MARGIN requirements, if required, are given in Specification 3.3.5.

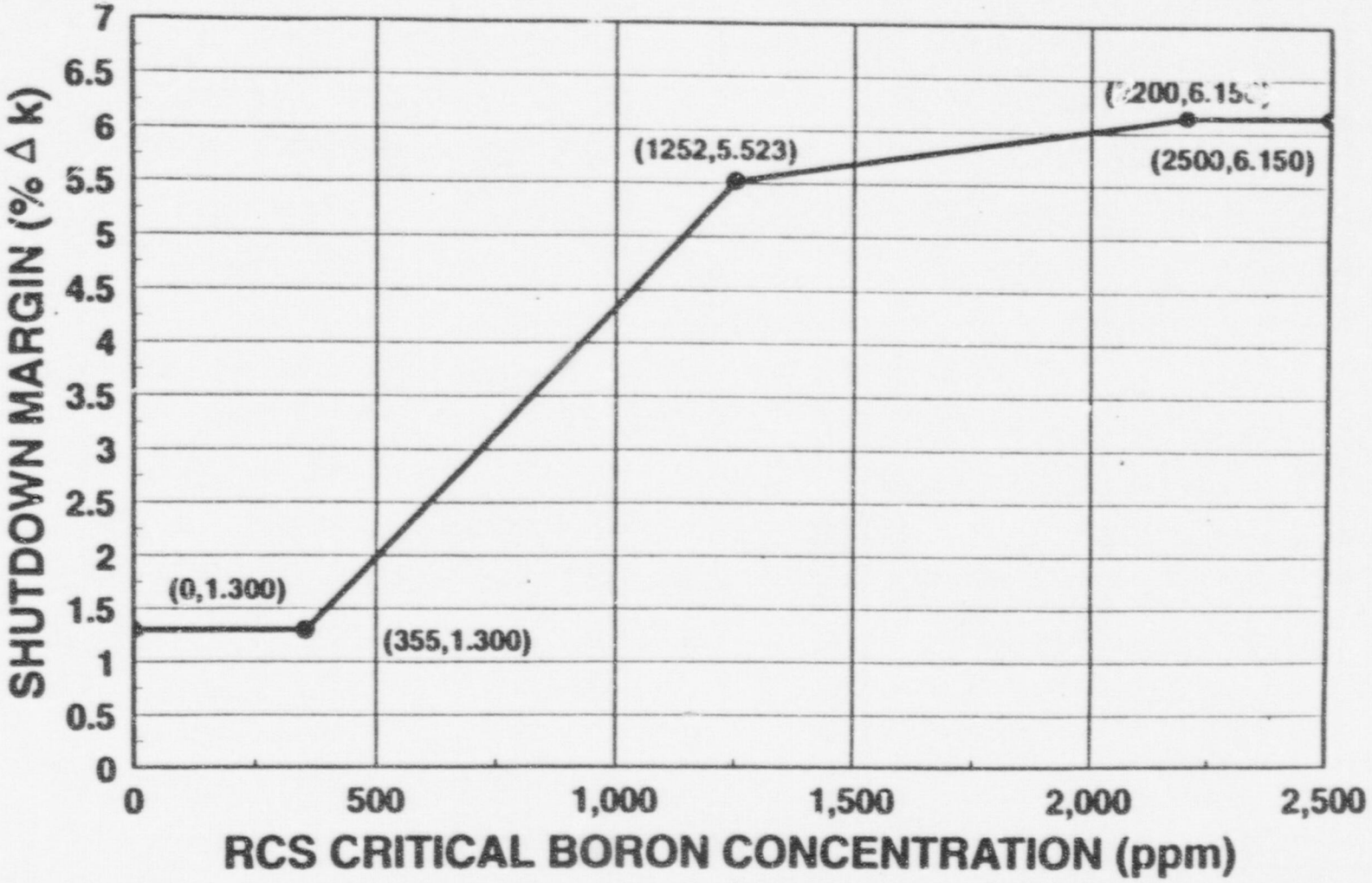


FIGURE 3.1-5
REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS NOT FILLED

## TABLE 3.3-1 (Continued)

## REACTOR TRIP SYSTEM INSTRUMENTATION

| FUNCTIONAL UNIT | TOTAL NO. OF CHANNELS | CHANNELS TO TRIP | MINIMUM CHANNELS OPERABLE | APPLICABLE MODES | ACTION |
|---|---|---|---|---|---|
| 17. Reactor Trip System Interlocks (Continued) | | | | | |
| c. Power Range Neutron Flux, P-8 | 4 | 2 | 3 | 1 | 8 |
| d. Power Range Neutron Flux, P-9 | 4 | 2 | 3 | 1 | 8 |
| e. Power Range Neutron Flux, P-10 | 4 | 2 | 3 | 1,2 | 8 |
| 18. Reactor Trip Breakers(2) | 2 | 1 | 2 | 1, 2 | 10, 13 |
| | 2 | 1 | 2 | 3*, 4*, 5* | 11 |
| 19. Automatic Trip and Interlock Logic | 2 | 1 | 2 | 1, 2 | 13A |
| | 2 | 1 | 2 | 3*, 4*, 5* | 11 |
| 20. Three Loop Operation Bypass Circuitry | 8 (1 switch per loop in each train) | 2 (From different loop switches in bypass) | 8 | 1, 2 | 1 |
| 21. DELETED | | | | | |



Amendment No. 57, 69, 79, 97, 164

TABLE 3.3-1 (Continued)

TABLE NOTATIONS

*When the Reactor Trip System breakers are in the closed position and the Control Rod Drive System is capable of rod withdrawal.

**Above the P-7 (At Power) Setpoint.

***Above the P-9 (Reactor Trip/Turbine Trip Interlock) Setpoint.

##Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

###Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

(1) The applicable MODES and ACTION statements for these channels noted in Table 3.3-3 are more restrictive and, therefore, applicable.

(2) Including any reactor trip bypass breakers that are racked in and closed for bypassing a reactor trip breaker.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours,

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1, and

c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER for four loop operation or 50% of RATED THERMAL POWER for three loop operation and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85 % of RATED THERMAL POWER for four loop operation or 60% of RATED THERMAL POWER for three loop operation within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint, and

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5 - (Not used)

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

ACTION 7 - (Not used)

ACTION 8 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

## TABLE 4.3-1 (Continued)

## REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| FUNCTIONAL UNIT | CHANNEL CHECK | CHANNEL CALIBRATION | ANALOG CHANNEL OPERATIONAL TEST | TRIP ACTUATING DEVICE OPERATIONAL TEST | ACTUATION LOGIC TEST | MODES FOR WHICH SURVEILLANCE IS REQUIRED |
|---|---|---|---|---|---|---|
| 18. Reactor Trip Breaker | N.A. | N.A. | N.A. | M(7, 11) | N.A. | 1, 2, 3*, 4*, 5* |
| 19. Automatic Trip and Interlock Logic | N.A. | N.A. | N.A. | N.A. | M(7) | 1, 2, 3*, 4*, 5* |
| 20. Three Loop Operation Bypass Circuitry | N.A. | N.A. | N.A. | R | N.A. | 1, 2 |
| 21. Reactor Trip Bypass Breaker | N.A. | N.A. | N.A. | M(7, 15) R(16) | N.A. | 1, 2, 3*, 4*, 5* |
| 22. DELETED | | | | | | |



Amendment No. 80, 79, 92, 100, 164

## TABLE 4.3-1 (Continued)

## TABLE NOTATIONS (Continued)

(10) Setpoint verification is not applicable.

(11) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.

(12) (not used)

(13) Reactor Coolant Pump Shaft Speed Sensor may be excluded from CHANNEL CALIBRATION.

(14) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).

(15) Local manual shunt trip prior to placing breaker in service.

(16) Automatic undervoltage trip.

(17) (not used).

(18) The surveillance frequency and/or MODES specified for these channels in Table 4.3-2 should be reviewed for applicability.

## 3/4.3.5 SHUTDOWN MARGIN MONITOR

### LIMITING CONDITION FOR OPERATION

3.3.5 Two channels of Shutdown Margin Monitors shall be OPERABLE

a. With a minimum count rate as designated in the CORE OPERATING LIMITS REPORT (COLR), or

b. If the minimum count rate in Specification 3.3.5.a cannot be met, then the Shutdown Margin Monitors may be made operable with a lower minimum count rate, as specified in the COLR, by borating the Reactor Coolant System above the requirements of Specification 3.1.1.1.2 or 3.1.1.2. The additional boration shall be:

1. A minimum of 150 ppm above the SHUTDOWN MARGIN requirements of Figure 3.1-1 (Mode 3 - 4 loops in operation) and Figure 3.1-2 (Mode 3 - 3 loops in operation), or

2. A minimum of 350 ppm above the SHUTDOWN MARGIN requirements of Figure 3.1-3 (Mode 4), Figure 3.1-4 (Mode 5 - RCS loops filled) and Figure 3.1-5 (Mode 5 - RCS loops drained).

APPLICABILITY: MODES 3*, 4, and 5.

ACTION:

a. With one Shutdown Margin Monitor inoperable, restore the inoperable channel to OPERABLE status within 48 hours.

b. With both Shutdown Margin Monitors inoperable or one Shutdown Margin Monitor inoperable for greater than 48 hours, immediately suspend all operations involving positive reactivity changes via dilution and rod withdrawal. Verify the valves listed in Specification 4.1.1.2.2 are closed and secured in position within the next 4 hours and at least once per 14 days thereafter.** Verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1.2 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

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* The shutdown margin monitors may be blocked during reactor startup in accordance with approved plant procedures.

**The valves may be opened on an intermittent basis under administrative controls as noted in Surveillance 4.1.1.2.2.

3/4.3.5 SHUTDOWN MARGIN MONITOR (continued)

SURVEILLANCE REQUIREMENTS

4.3.5 a. Each of the above required shutdown margin monitoring instruments shall be demonstrated OPERABLE by an ANALOG CHANNEL OPERATIONAL TEST at least once per 92 days that shall include verification that the Shutdown Margin Monitor is set per the Core Operating Limits Report (COLR).

b. At least once per 24 hours VERIFY the minimum count rate (counts/sec) as defined within the COLR.

BORATION SYSTEMS (Continued)

MARGIN from expected operating conditions equivalent to that required by Figure 3.1-4 after xenon decay and cooldown to 200°F. The maximum boration capability (minimum boration volume) requirement is established to conservatively bound expected operating conditions throughout core operating life. The initial RCS boron concentration is based on a minimum expected hot full power or hot zero power condition (peak xenon). The final RCS boron concentration assumes that the most reactive control rod is not inserted into the core. This set of conditions requires a minimum usable volume of 21,802 gallons of 6600 ppm borated water from the boric acid storage tanks or 1,166,000 gallons of 2700 ppm borated water from the refueling water storage tank (RWST). A minimum RWST volume of 1,166,000 gallons is specified to be consistent with ECCS requirement.

With the plant in MODE 4, one boron injection flowpath is acceptable without single failure consideration for emergency boration requirements on the basis of the stable reactivity condition of the reactor, the emergency power supply requirement for the OPERABLE charging pump, and the fact that the plant is administratively borated to at least MODE 5 requirements prior to cooldown to MODE 4. Also, the primary grade water addition path to the charging pumps is surveilled to be locked closed to prevent a direct dilution accident in MODE 4.

With the plant in MODES 5 and 6, one boron 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 changes in the event the single boron injection system becomes inoperable.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE, when cold overpressure protection is in service, provides assurance that a mass addition pressure transient can be relieved by operation of a single PORV or RHR suction relief valve.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.3% $\Delta k/k$ after xenon decay and cooldown from 200°F to 140°F. This condition requires either a usable volume of 4100 gallons of 6600 ppm borated water from the boric acid storage tanks or 250,000 gallons of 2700 ppm borated water from the RWST. The unusable volume in each boric acid storage tank is 1300 gallons.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 7.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The minimum RWST solution temperature for MODES 5 and 6 is based on analysis assumptions in addition to freeze protection considerations. The minimum/maximum RWST solution temperatures for MODES 1, 2, 3 and 4 are based on analysis assumptions.

REACTOR TRIP SYSTEM INSTRUMENTATION and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (Continued)

The Engineered Safety Features Actuation System interlocks perform the following functions:

P-4 Reactor tripped - Actuates Turbine trip, closes main feedwater valves on $T_{avg}$ below Setpoint, prevents the opening of the main feedwater valves which were closed by a Safety Injection or High Steam Generator Water Level signal, allows Safety Injection block so that components can be reset or tripped.

Reactor not tripped - prevents manual block of Safety Injection.

P-11 On increasing pressurizer pressure, P-11 automatically reinstates Safety Injection actuation on low pressurizer pressure and low steam line pressure. On decreasing pressure, P-11 allows the manual block of Safety Injection actuation on low pressurizer pressure and low steam line pressure.

P-12 On increasing reactor coolant loop temperature, P-12 automatically provides an arming signal to the Steam Dump System. On decreasing reactor coolant loop temperature, P-12 automatically removes the arming signal from the Steam Dump System.

P-14 On increasing steam generator water level, P-14 automatically trips all feedwater isolation valves, main feed pumps and main turbine, and inhibits feedwater control valve modulation.

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING FOR PLANT OPERATIONS

The OPERABILITY of the radiation monitoring instrumentation for plant operations ensures that: (1) the associated action will be initiated when the radiation level monitored by each channel or combination thereof reaches its Setpoint, (2) the specified coincidence logic is maintained, and (3) sufficient redundancy is maintained to permit a channel to be out-of-service for testing or maintenance. The radiation monitors for plant operations senses radiation levels in selected plant systems and locations and determines whether or not predetermined limits are being exceeded. If they are, the signals are combined into logic matrices sensitive to combinations indicative of various accidents and abnormal conditions. Once the required logic combination is completed, the system sends actuation signals to initiate alarms.

3/4 3.5 SHUTDOWN MARGIN MONITOR

The Shutdown Margin Monitors provide an alarm that a Boron Dilution Event may be in progress. The minimum count rate of Specification 3/4.3.5 and the SHUTDOWN MARGIN requirements of Figures 3.1-1, 3.1-2, 3.1-3, 3.1-4, and 3.1-5 ensure that at least 15 minutes are available for operator action from the time of the Shutdown Margin Monitor alarm to total loss of shutdown margin. By borating an additional 150 ppm above the SHUTDOWN MARGIN required by Figure 3.1-1 or 3.1-2, or 350 ppm above the SHUTDOWN MARGIN required by Figure 3.1-3, 3.1-4, or 3.1-5, lower values of minimum count rate are accepted.

Shutdown Margin Monitors

Background:

The purpose of the Shutdown Margin Monitors (SMM) is to annunciate an increase in core subcritical multiplication allowing the operator at least 15 minutes response time to mitigate the consequences of the inadvertent addition of unborated primary grade water (boron dilution event) into the Reactor Coolant System (RCS) when the reactor is shut down (Modes 3, 4, and 5).

The SMMs utilizes two channels of source range instrumentation (GM detectors). Each channel provides a signal to its applicable train of SMM. The SMM channel uses the last 600 or more counts to calculate the count rate and updates the measurement after 30 new counts or 1 second, whichever is longer. Each channel has 20 registers that hold the counts (20 registers X 30 count = 600 counts) for averaging the rate. As the count rate decreases, the longer it takes to fill the registers (fill the 30 count minimum). As the instrument's measured count rate decreases, the delay time in the instrument's response increases. This delay time leads to the requirement of a minimum count rate for OPERABILITY.

During the dilution event, count rate will increase to a level above the normal steady state count rate. When this new count rate level increases above the instrument's setpoint, the channel will alarm alerting the operator of the event.

Applicable Safety Analysis

The SMM senses abnormal increases in the source range count per second and alarms the operator of an inadvertent dilution event. This alarm will occur at least 15 minutes prior to the reactor achieving criticality. This 15 minute window allows adequate operator response time to terminate the dilution, FSAR Section 15.4.6.

LCO

LCO 3.3.5 provides the requirements for OPERABILITY of the instrumentation of the SMMs that are used to mitigate the boron dilution event. Two trains are required to be OPERABLE to provide protection against single failure.

Applicability

The SMM must be OPERABLE in MODES 3, 4, and 5 because the safety analysis identifies this system as the primary means to alert the operator and mitigate the event. The SMMs are allowed to be blocked during start up activities in MODE 3 in accordance with approved plant procedures. The alarm is blocked to allow the SMM channels to be used to monitor the 1/M approach to criticality.

The SMM are not required to be operable in MODES 1 and 2 as other RPS is credited with accident mitigation, over temperature delta temperature and power range neutron flux high (low setpoint of 25 percent RTP) respectively. The SMMs are not required to be OPERABLE in Mode 6 as the dilution event is precluded by administrative controls over all dilution flow paths (Technical Specification 4.1.1.2.2).

Actions

Channel inoperability of the SMMs can be caused by failure of the channel's electronics, failure of the channel to pass its calibration procedure, or by the channel's count rate falling below the minimum count rate for operability. This can occur when the count rate is so low that the channel's delay time is in excess of that assumed in the safety analysis. In any of the above conditions, the channel must be declared inoperable and the appropriate action statement entered. If the SMMs are declared inoperable due to low count rates, an RCS heatup will cause the SMM channel count rate to increase to above the minimum count rate for operability. Allowing the plant to increase modes will actually return the SMMs to OPERABLE status. Once the SMM channels are above the minimum count rate for operability, the channels can be declared operable and the LCO action statements can be exited.

LCO 3.3.5, Action a. - With one train of SMM inoperable, Action a. requires the inoperable train to be returned to OPERABLE status within 48 hours. In this condition, the remaining SMM train is adequate to provide protection. If the above required action cannot be met, alternate compensatory actions must be performed to provide adequate protection from the boron dilution event. All operations involving positive reactivity changes associated with RCS dilutions and rod withdrawal must be suspended, and all dilution flowpaths must be closed and secured in position (locked closed per Technical Specification 4.1.1.2.2) within the following 4 hours.

LCO 3.3.5, Action b. - With both trains of SMM inoperable, alternate protection must be provided:

1. Positive reactivity operations via dilutions and rod withdrawal are suspended. The intent of this action is to stop any planned dilutions of the RCS. The SMMs are not intended to monitor core reactivity during RCS temperature changes. The alarm setpoint is routinely reset during the plant heatup due to the increasing count rate. During cooldowns as the count rate decreases, baseline count rates are continually lowered automatically by the SMMs. The Millstone Unit No. 3 boron dilution analysis assumes steady state RCS temperature conditions.

2. All dilution flowpaths are isolated and placed under administrative control (locked closed). This action provides redundant protection and defense in depth (safety overlap) to the SMMs. In this configuration, a boron dilution event (BDE) cannot occur. This is the basis for not having to analyze for BDE in Mode 6. Since the BDE cannot occur with the dilution flow paths isolated, the SMMs are not required to be operable as the event cannot occur and operable SMMs provide no benefit.

3. Increase the shutdown margin surveillance frequency from every 24 hours to every 12 hours. This action in combination with the above, provide defense in depth and overlap to the loss of the SMMs.

Surveillance Requirements

The SMMs are subject to an ACOT every 92 days to ensure each train of SMM is fully operational. This test shall include verification that the SMMs are set per the Core Operating Limit Report.