

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:

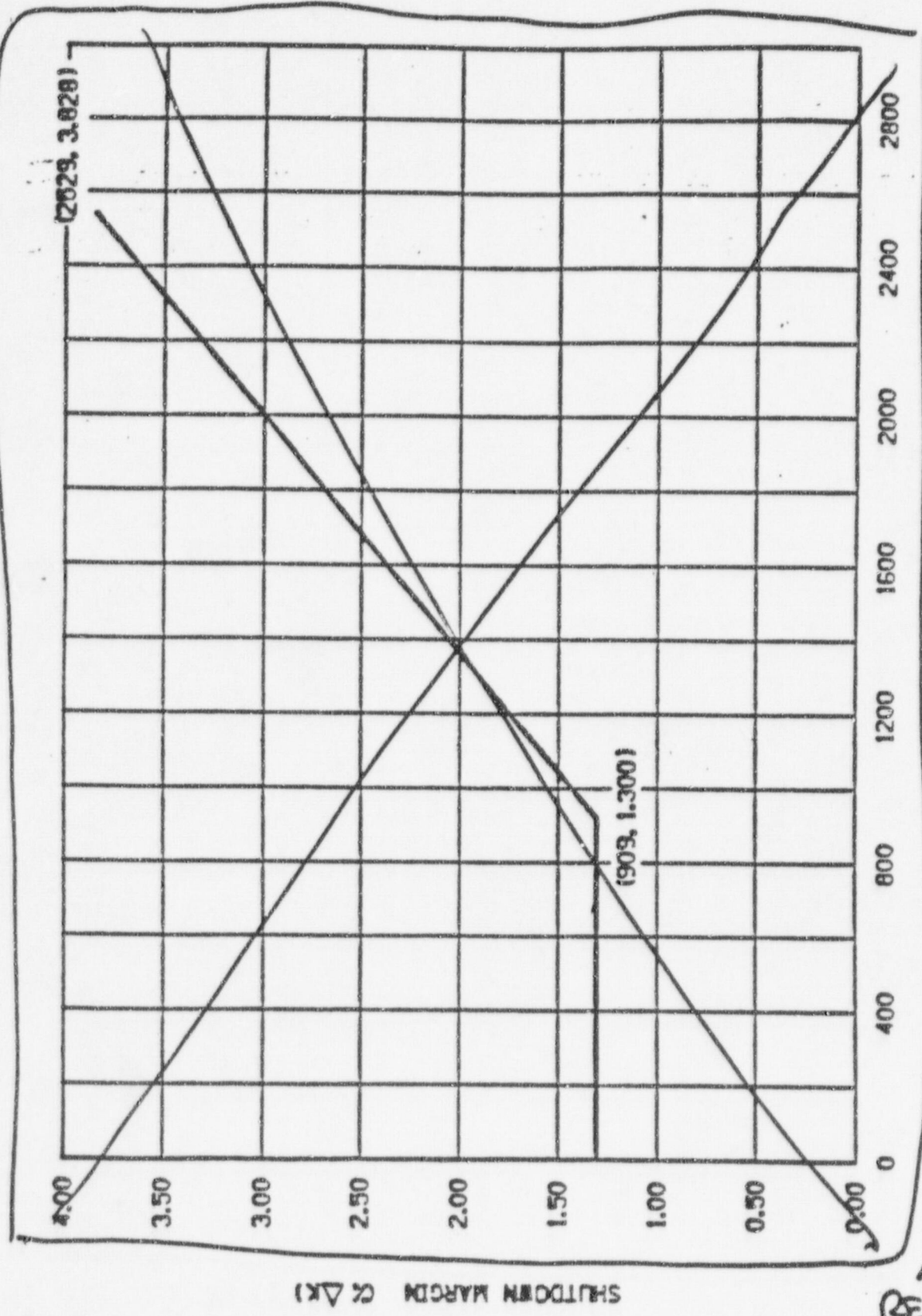
- a. Within 1 hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be verified acceptable with an increased allowance for the withdrawn worth of the immovable or untrippable control rod(s); and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

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

INSERT

9705160011
PDR ADOCK 05000423
PDR



RCS CRITICAL BORON CONCENTRATION (ppm)

FIGURE 3.1-1

REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH FOUR LOOPS IN OPERATION

DELETED

AND

REPLACED

BY: INSERT

3.1-1

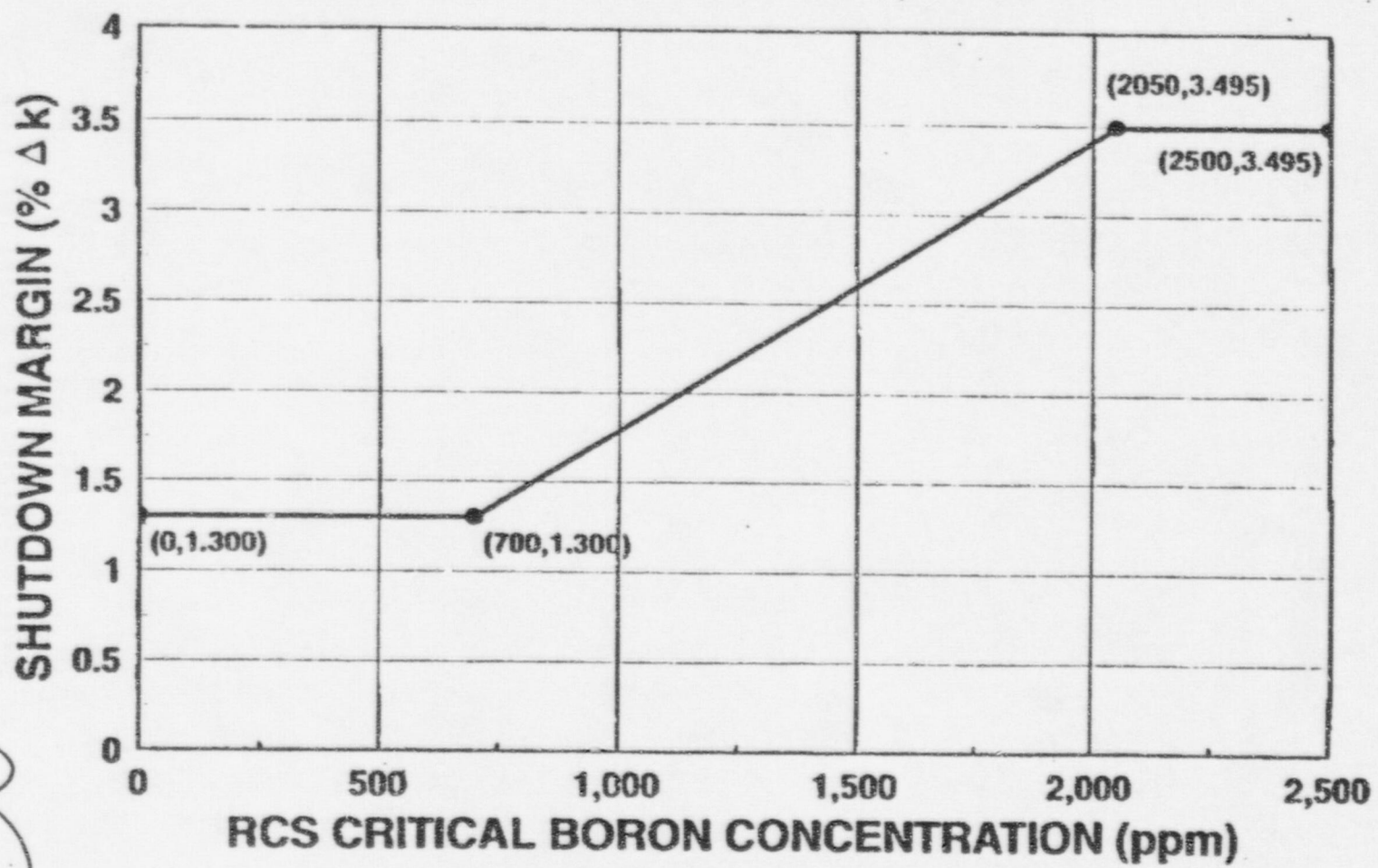
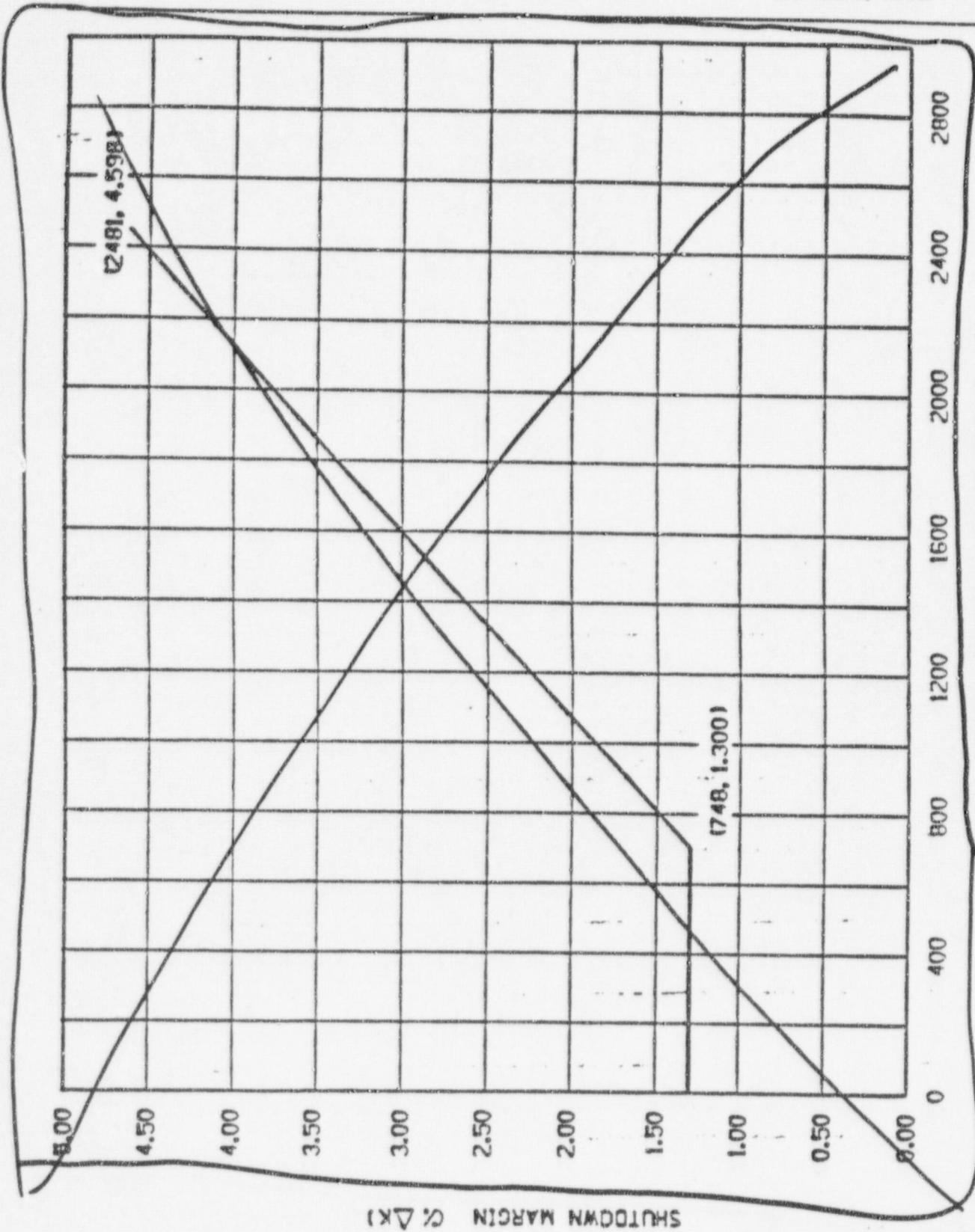


FIGURE 3.1-1
REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH FOUR LOOPS IN OPERATION

3/4 1-4

INSERT
3.1-1



REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH THREE LOOPS IN OPERATION

FIGURE 3.1-2

DELETED AND REPLACED BY: INLET 3.1-2

3/4 1-5

INSERT
3.1-2

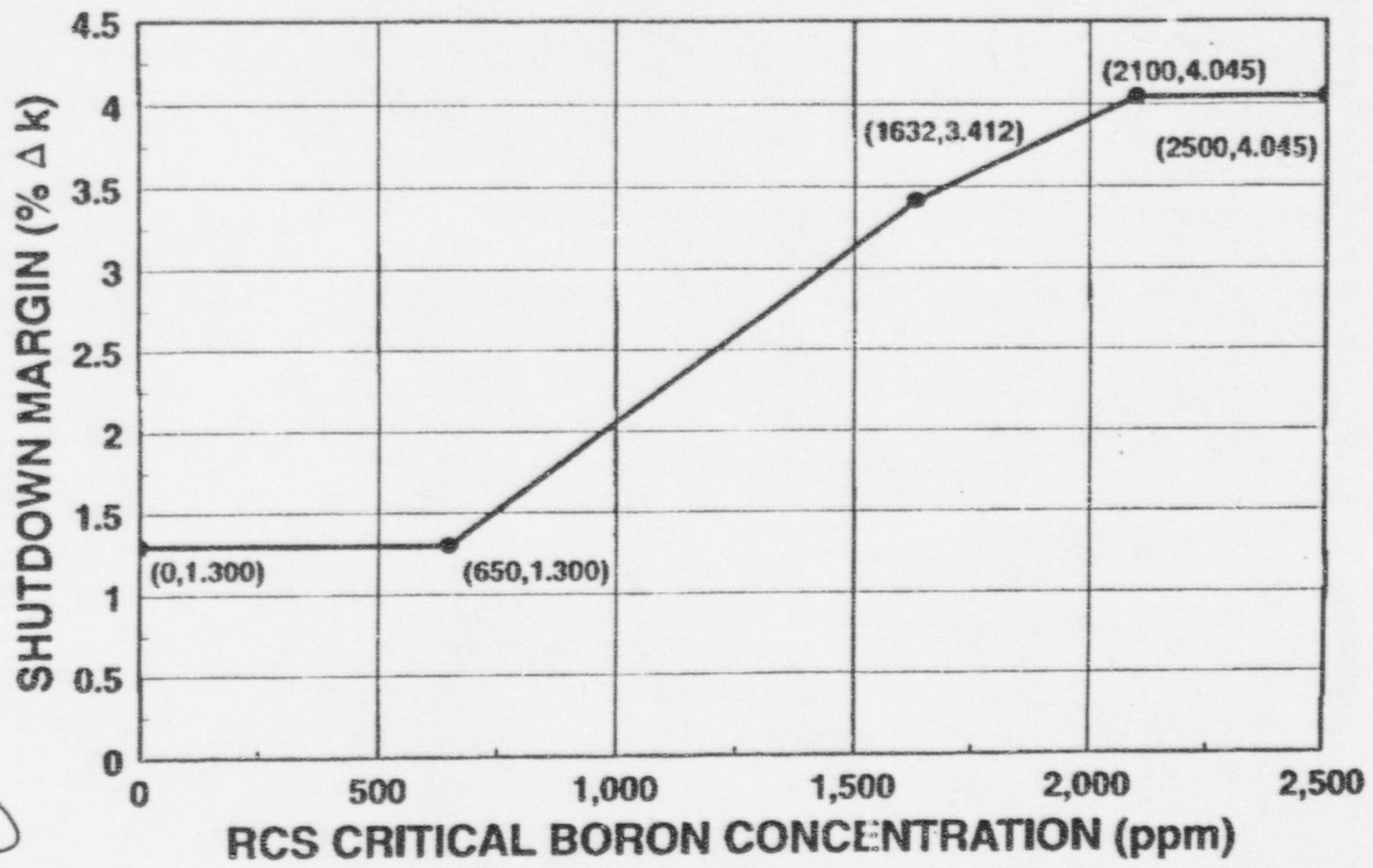
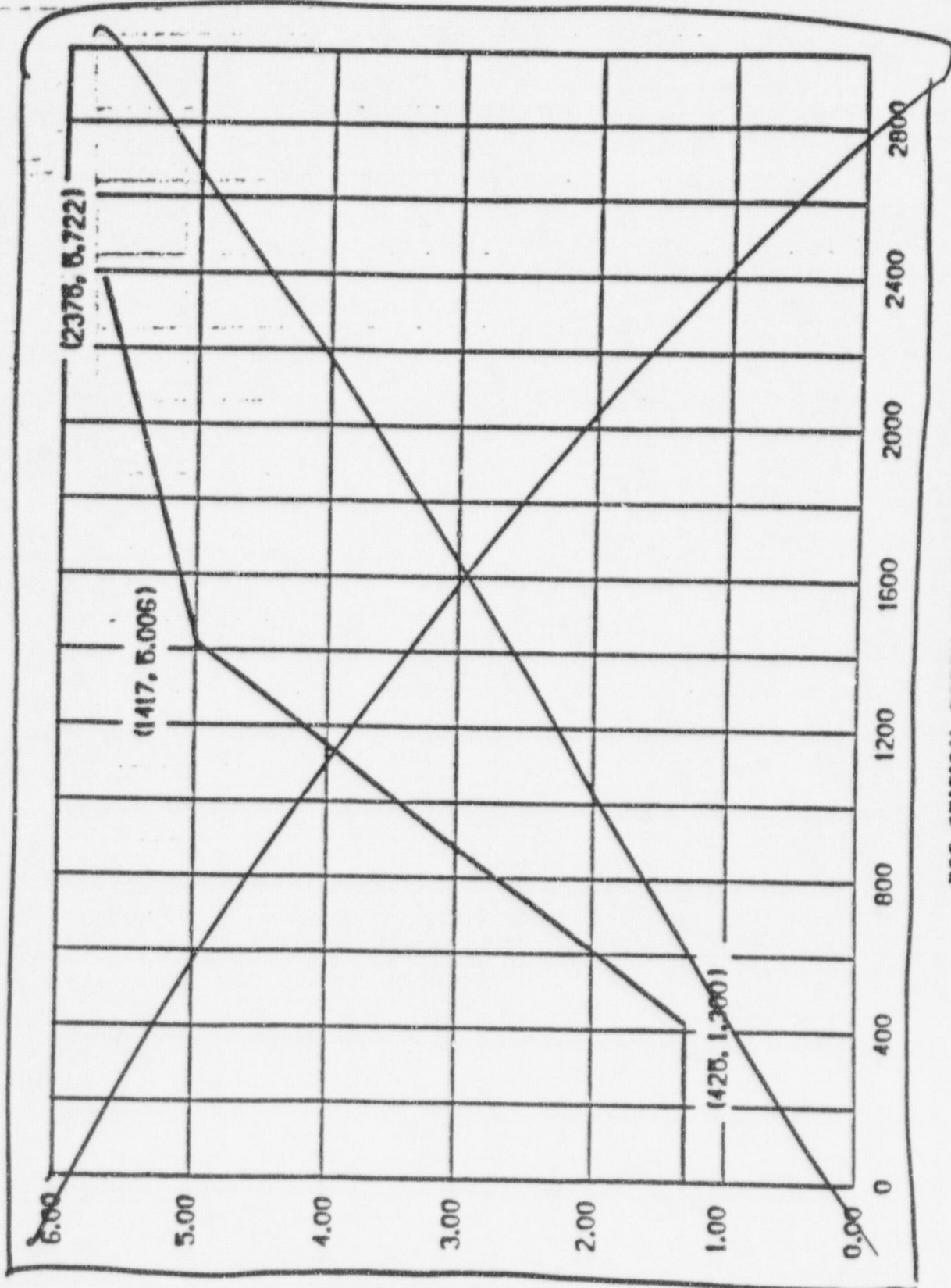


FIGURE 3.1-2
REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH THREE LOOPS IN OPERATION

March 11, 1991



RCS CRITICAL BORON CONCENTRATION (ppm)

FIGURE 3.1-3

REQUIRED SHUTDOWN MARGIN FOR MODE 4

SHUTDOWN MARGIN (% ΔK)

DELETED AND
REPLACED BY :

INSERT 3.1-3
AMENDMENT NO. 60

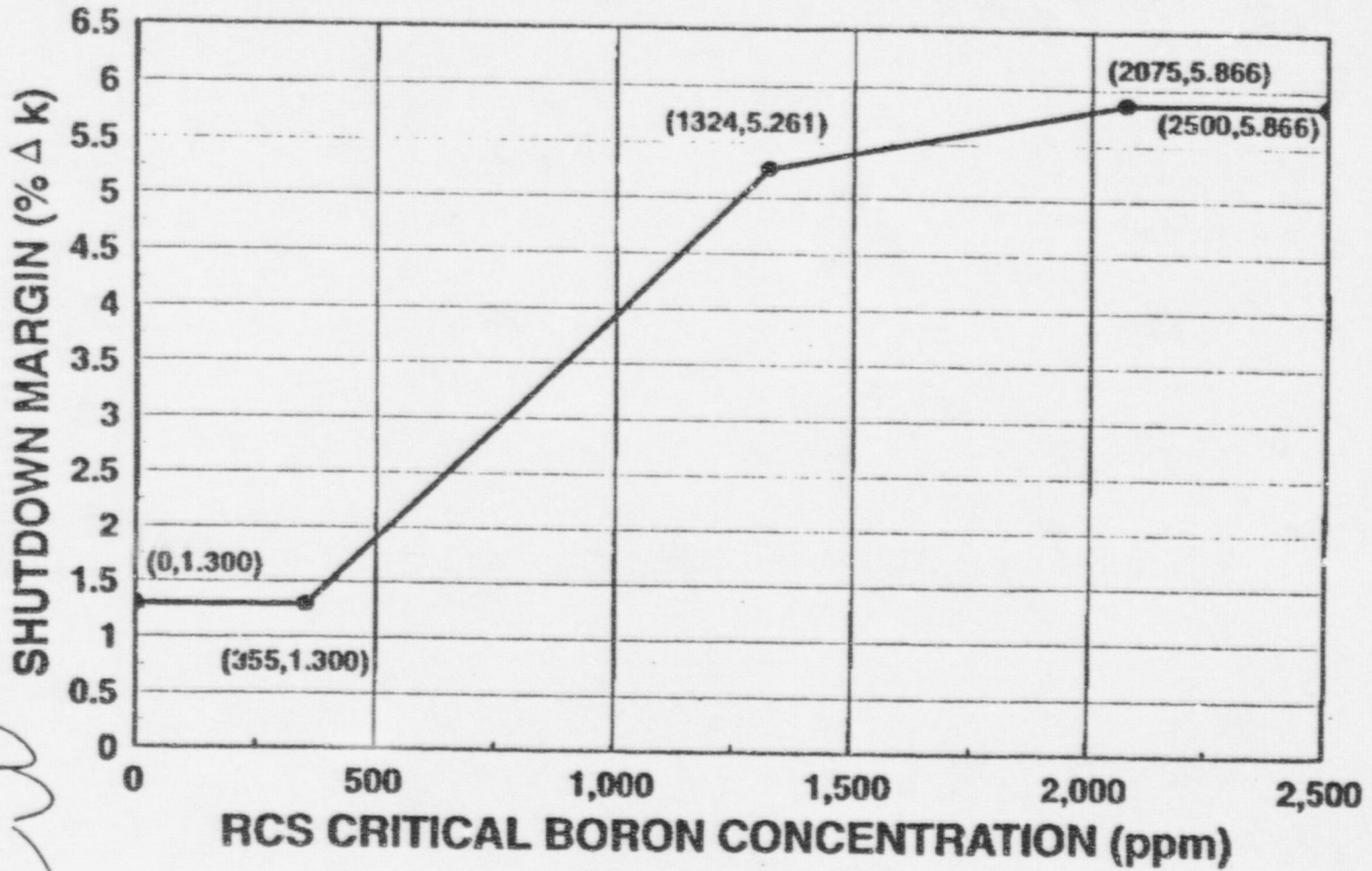
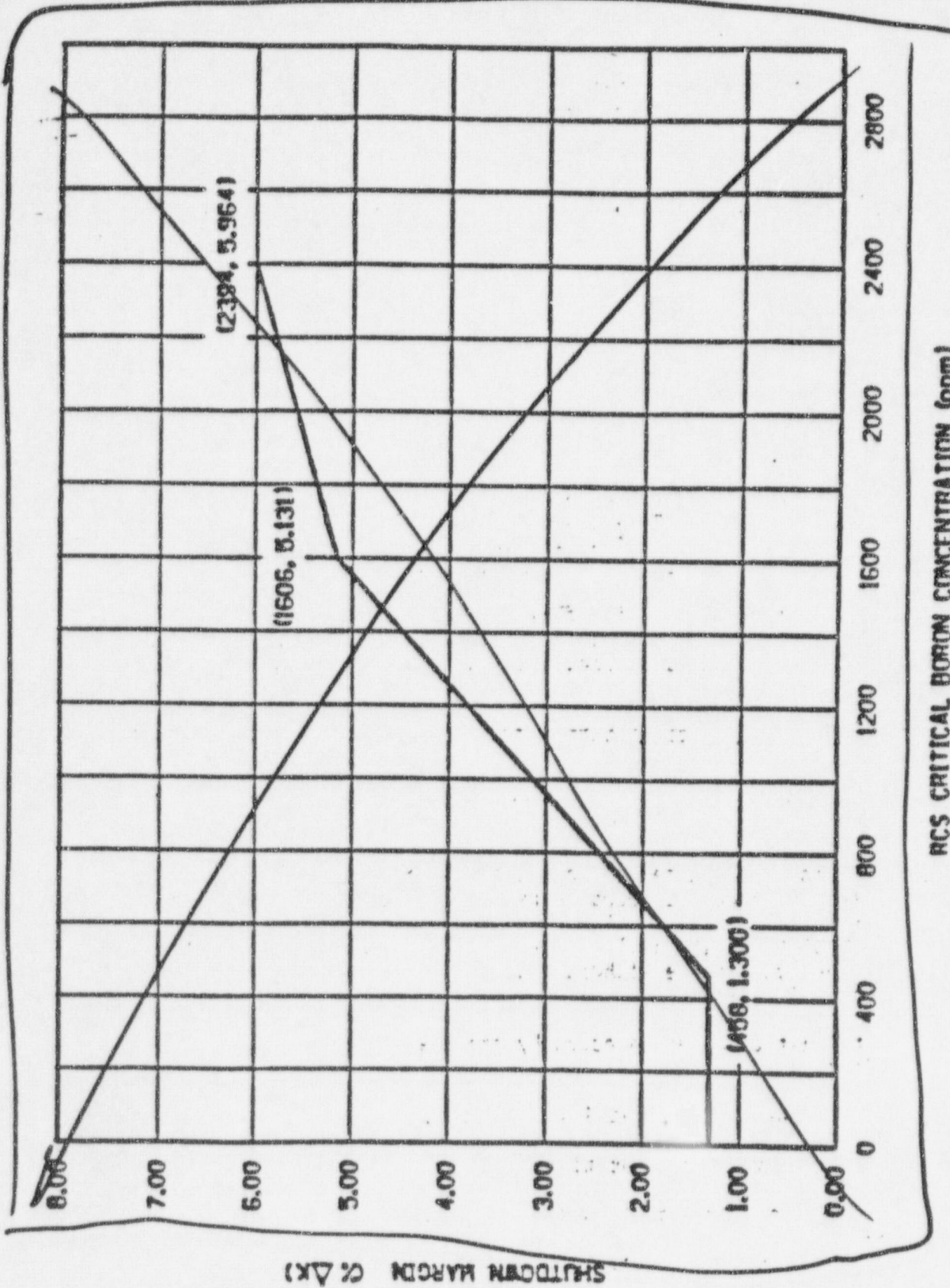


FIGURE 3.1-3
REQUIRED SHUTDOWN MARGIN FOR MODE 4

3/4 1-6

INSERT
3.1-3



RCS CRITICAL BORON CONCENTRATION (ppm)

FIGURE 3.1-4

REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS FILLED

DELETED AND REPLACED BY INSERT 3.1-4

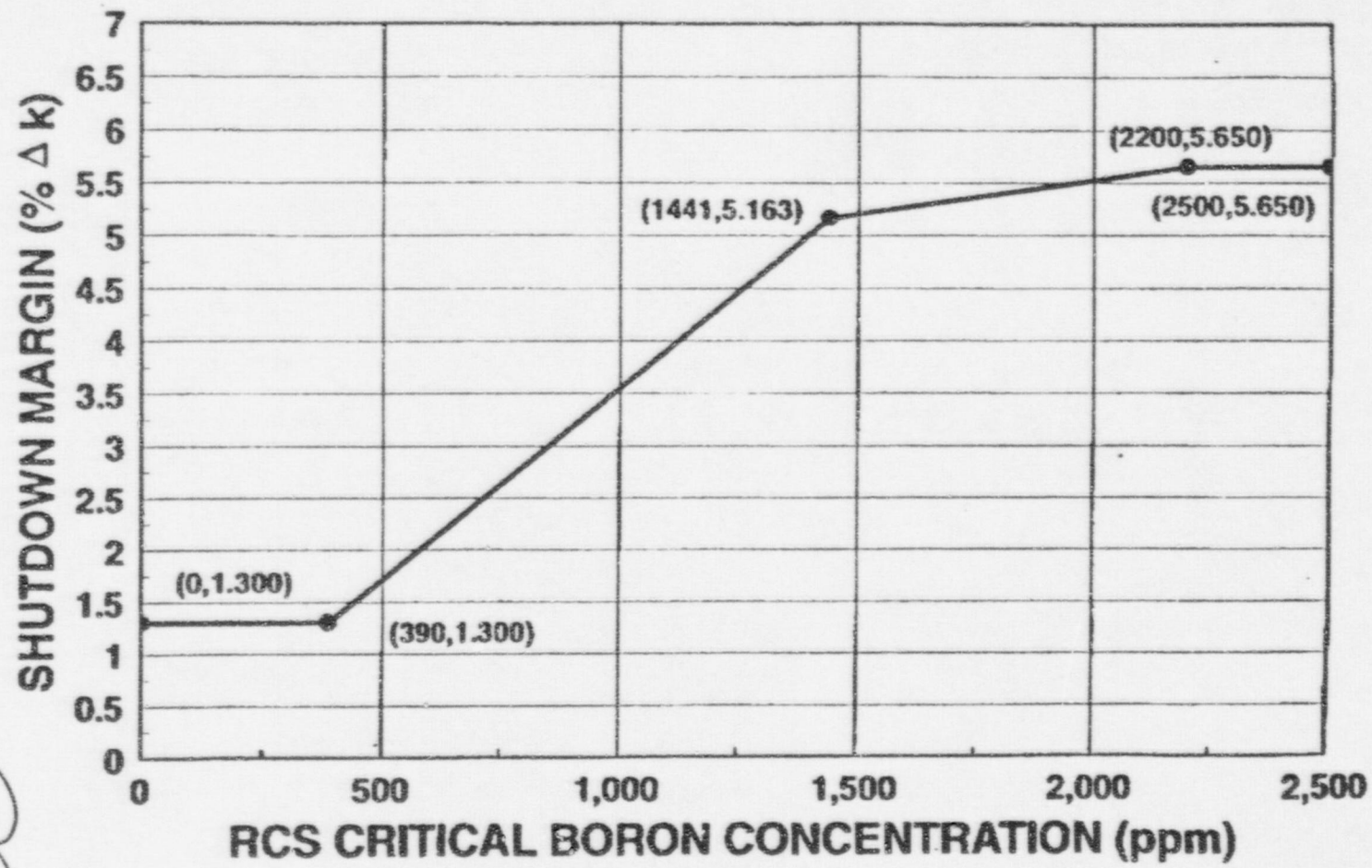


FIGURE 3.1-4
REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS FILLED

3/4 1-7

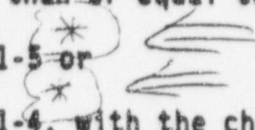
INSERT
3-1-41

REACTIVITY CONTROL SYSTEMS

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, with 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,

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

INSERT

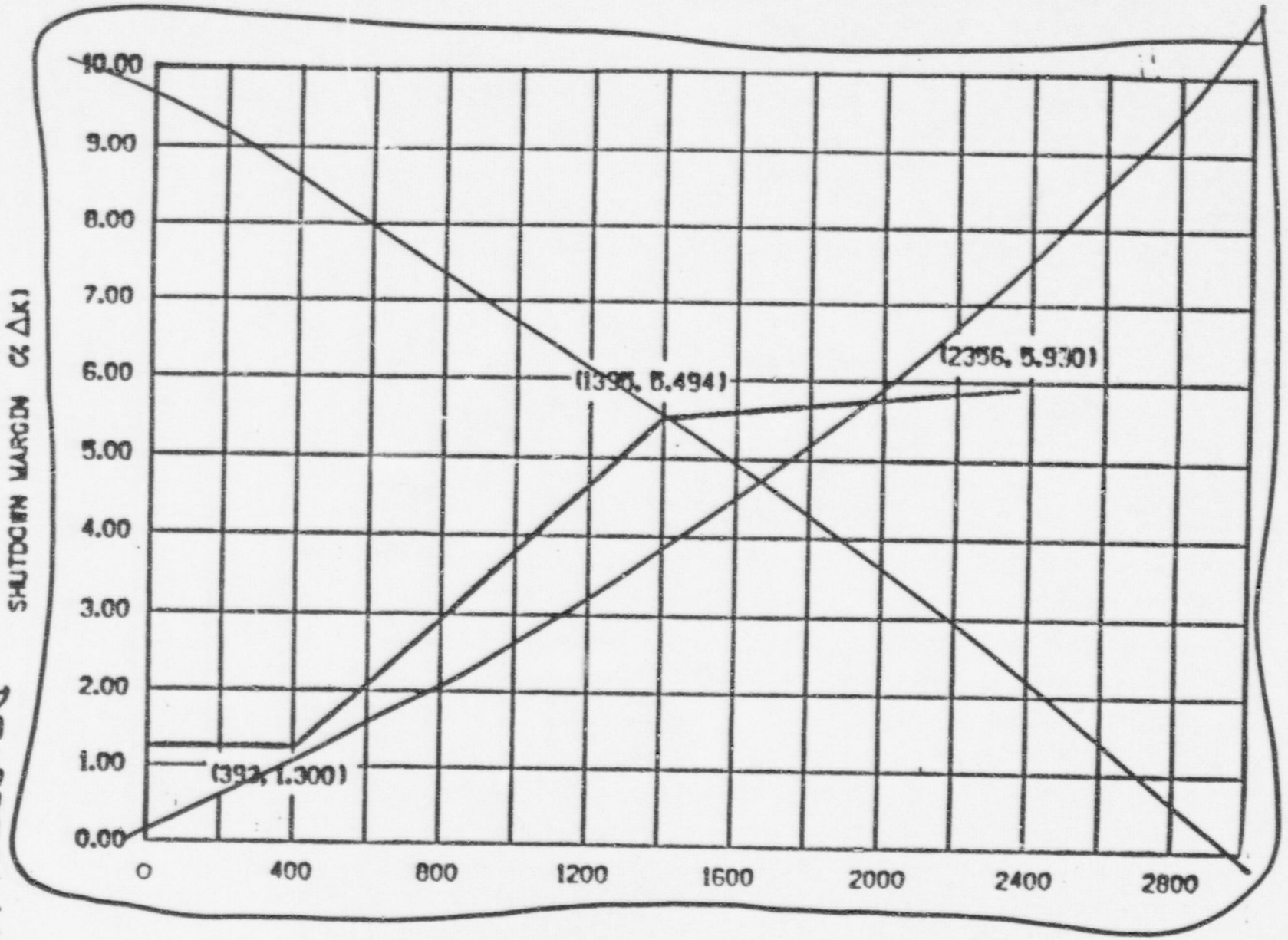
MILLSTONE - UNIT 3
0208

3/4 1-9

INSERT 3.1-5

Amendment No. 99, 99

DELETED AND
REPLACED BY



RCS CRITICAL BORON CONCENTRATION (ppm)
FIGURE 3.1-5
REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS NOT FILLED

December 29, 1994

3/4 1-9

INSERT
3.1-5

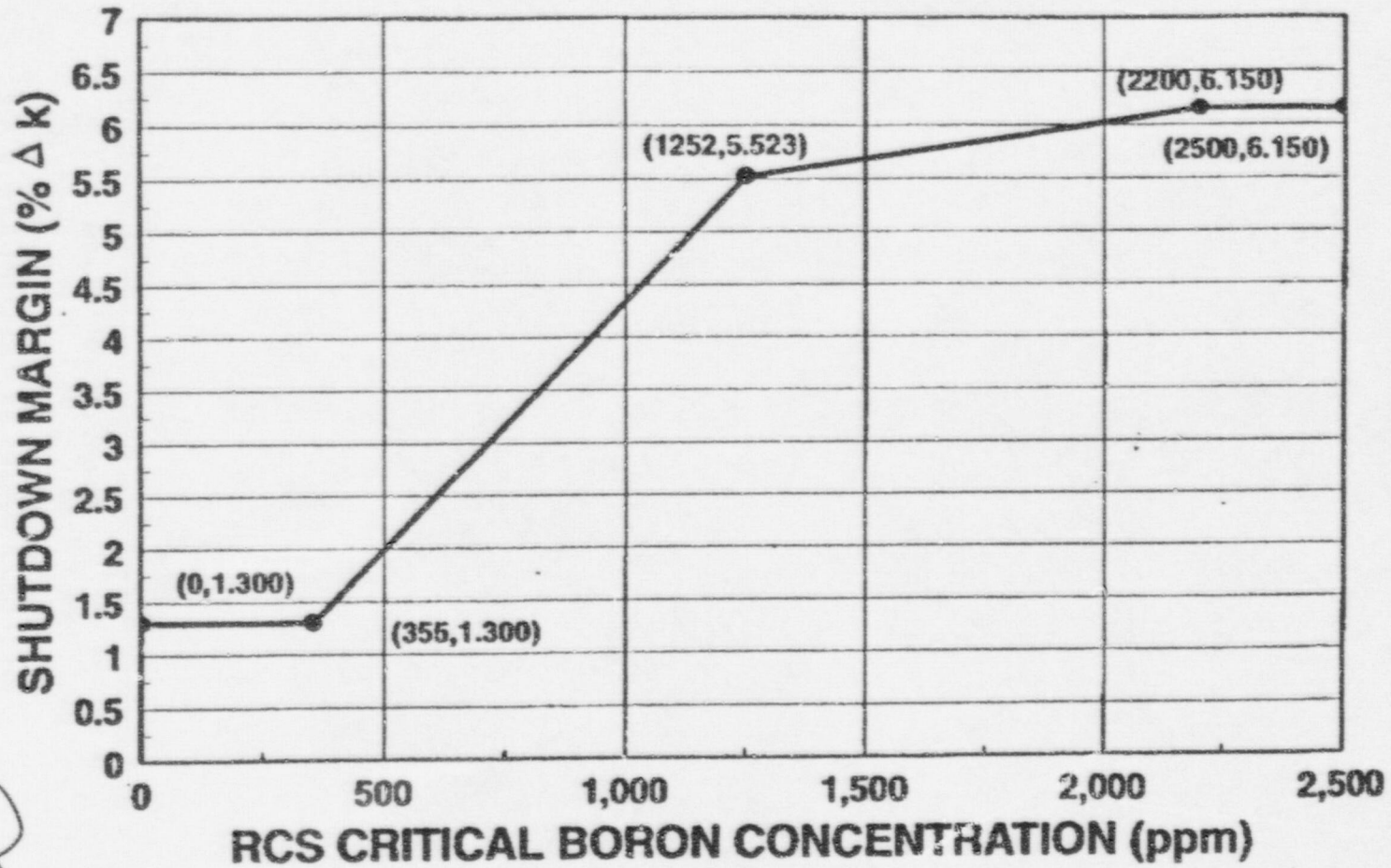


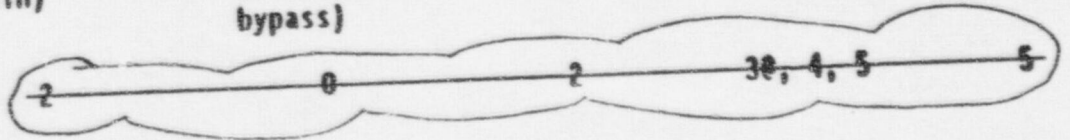
FIGURE 3.1-5
REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS DRAINED

TABLE 3.3-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
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	2	8	1, 2	1
	(1 switch per loop in each train)	(From different loop switches in bypass)			

21. Shutdown Margin Monitor

DELETED



3/4 3-4

Amendment No. 87, 89, 79, 93

8/12/94

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.

⊙ The Shutdown Margin monitor may be blocked during reactor startup in accordance with approved procedure.

- (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 -

- (a) 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 suspend all operations involving positive reactivity changes via dilution and rod withdrawal, and verify valves as per Specification 4.1.1.2.2 are closed and secured in position within the next four hours.
- (b) With no channels OPERABLE, suspend all operations involving positive reactivity changes via dilution and rod withdrawal, and verify valves per Specification 4.1.1.2.2 are closed and secured in position within the next 4 hours. Verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1.2 or 3.1.1.2 as applicable within the next hour. Continue to verify valves closed and secured every 14 days and verify SHUTDOWN MARGIN every 12 hours.

INSERT

(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 ^a , 4 ^a , 5 ^a
19. Automatic Trip and Interlock Logic	N.A.	N.A.	N.A.	N.A.	M(7)	1, 2, 3 ^a , 4 ^a , 5 ^a
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 ^a , 4 ^a , 5 ^a
22. Shutdown Margin Monitor	N.A.	N.A.	Q(19)	N.A.	N.A.	3, 4, 5

DELETED

January 3, 1995

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.
- (19) Quarterly surveillance shall include verification that the Shutdown Margin Monitor is set per the CORE OPERATING LIMITS REPORT (COLR).

INSERT FOR PTSCR # 3-15-97

INSTRUMENTATION

3/4.3.5 SHUTDOWN MARGIN MONITOR

RWS
4/21/97

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.

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.

* 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.

REACTIVITY CONTROL SYSTEMSBASESBORATION SYSTEMS (Continued) 3.1-4

MARGIN from expected operating conditions of equivalent to that required by Figure 3.1-5 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 RCS temperature below 200°F, 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 and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

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.

INSTRUMENTATION**BASES****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.

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.

MOVE TO BASES
SECTION 3/4 3.5.
B 3/4 3-3

MOVE TO BASES SECTION 3/4 3.5

November 14, 1996

BASES (continued)

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

3.3.5

LCO 3.3.1 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 I/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.

(S(a)) With one train of SMM inoperable, Action (S(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

LCO 3.3.5, ACTION a.

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.

5(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.

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.

MOVE TO BASES SECTION 3/4.3.5

LCO 3.3.5, ACTION b.

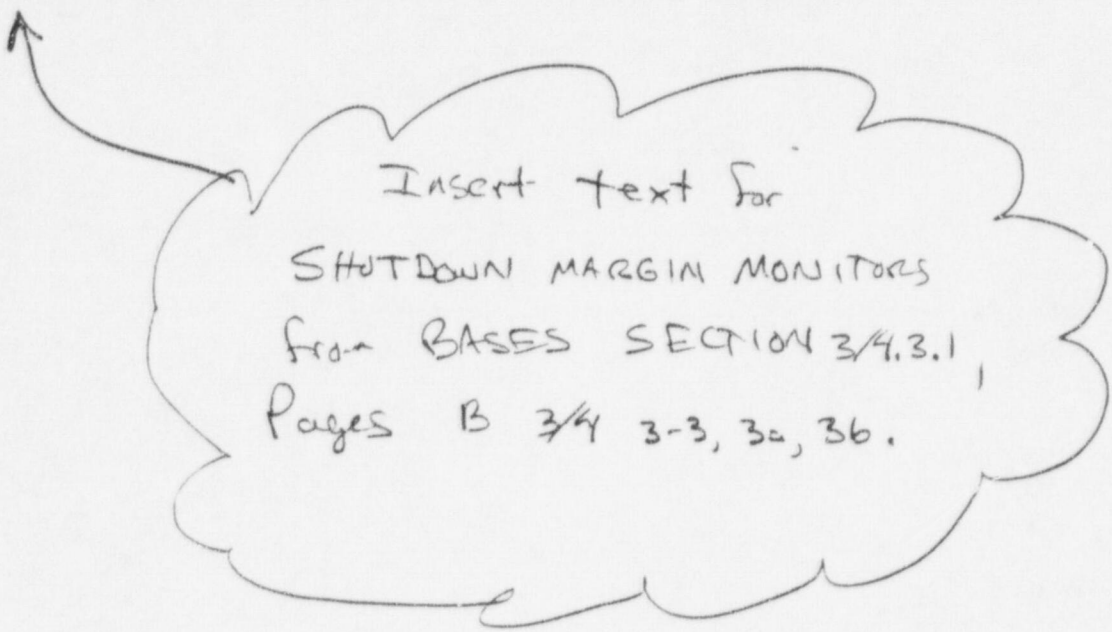
INSERT FOR PTSCR # 3-16-97

INSTRUMENTATION

BASES

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 Figures 3.1-1 or 3.1-2, or 350 ppm above the SHUTDOWN MARGIN required by Figures 3.1-3, 3.1-4 or 3.1-5, lower values of minimum count rate are acceptable.



Insert text for
SHUTDOWN MARGIN MONITORS
from BASES SECTION 3/4.3.1,
Pages B 3/4 3-3, 3a, 3b.

B 3/4 3-7

ADMINISTRATIVE CONTROLSCORE OPERATING LIMITS REPORT (Cont.)

8. WCAP-11946, "Safety Evaluation Supporting a More Negative ECL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station Unit 3," September 1988 (W Proprietary).
9. WCAP-10054-P-A, "WESTINGHOUSE SMALL BREAK ECCS EVALUATION MODEL USING THE NOTRUMP CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)
10. WCAP-10079-P-A, "NOTRUMP - A NODAL TRANSIENT SMALL BREAK AND GENERAL NETWORK CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)
11. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

12. Letter from V. L. Rooney (USNRC) to J. F. Opeka, "Safety Evaluation for Topical Report, NUSCO-152, Addendum 4, 'Physics Methodology for PWR Reload Design'," TAC No. M91815, July 18, 1995.

← INSERT

Attachment 3

Millstone Nuclear Power Station Unit No. 3
Proposed Revision to Technical Specification
Shutdown Margin Requirements and Shutdown Margin Monitor Operability
for Modes 3, 4 and 5
PTSCR 3-16-97
Retyped Pages

RETYPE OF PROPOSED REVISION

Refer to the attached retype of the proposed revision to the Technical Specifications. The attached retype reflects the currently issued version of the Technical Specifications. Pending Technical Specification revisions or Technical Specification revisions issued subsequent to this submittal are not reflected in the enclosed retype. The enclosed retype should be checked for continuity with Technical Specifications prior to issuance.

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>
TABLE 3.3-13 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION	3/4 3-75
TABLE 4.3-9 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS	3/4 3-78
3/4.3.4 TURBINE OVERSPEED PROTECTION	3/4 3-81
3/4.3.5 SHUTDOWN MARGIN MONITOR	3/4 3-82
<u>3/4.4 REACTOR COOLANT SYSTEM</u>	
3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION	
Startup and Power Operation	3/4 4-1
Hot Standby	3/4 4-2
Hot Shutdown	3/4 4-3
Cold Shutdown - Loops Filled	3/4 4-5
Cold Shutdown - Loops Not Filled	3/4 4-6
Isolated Loop	3/4 4-7
Isolated Loop Startup	3/4 4-8
3/4.4.2 SAFETY VALVES	
Shutdown	3/4 4-9
Operating	3/4 4-10
3/4.4.3 PRESSURIZER	3/4 4-11
3/4.4.4 RELIEF VALVES	3/4 4-12
3/4.4.5 STEAM GENERATORS	3/4 4-14
TABLE 4.4-1 MINIMUM NUMBER OF STEAM GENERATORS TO BE INSPECTED DURING INSERVICE INSPECTION	3/4 4-19
TABLE 4.4-2 STEAM GENERATOR TUBE INSPECTION	3/4 4-20
3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE	
Leakage Detection Systems	3/4 4-21
Operational Leakage	3/4 4-22
TABLE 3.4-1 REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES	3/4 4-24
3/4.4.7 CHEMISTRY	3/4 4-25
TABLE 3.4-2 REACTOR COOLANT SYSTEM CHEMISTRY LIMITS	3/4 4-26
TABLE 4.4-3 REACTOR COOLANT SYSTEM CHEMISTRY LIMITS SURVEILLANCE REQUIREMENTS	3/4 4-27
3/4.4.8 SPECIFIC ACTIVITY	3/4 4-28

INDEX

BASES

<u>SECTION</u>	<u>PAGE</u>
<u>3/4.0 APPLICABILITY</u>	B 3/4 0-1
<u>3/4.1 REACTIVITY CONTROL SYSTEMS</u>	
3/4.1.1 BORATION CONTROL	B 3/4 1-1
3/4.1.2 BORATION SYSTEMS	B 3/4 1-2
3/4.1.3 MOVABLE CONTROL ASSEMBLIES	B 3/4 1-3a
<u>3/4.2 POWER DISTRIBUTION LIMITS</u>	B 3/4 2-1
3/4.2.1 AXIAL FLUX DIFFERENCE	B 3/4 2-1
3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR AND RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR	B 3/4 2-3
3/4.2.4 QUADRANT POWER TILT RATIO	B 3/4 2-5
3/4.2.5 DNB PARAMETERS	B 3/4 2-5
<u>3/4.3 INSTRUMENTATION</u>	
3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM INSTRUMENTATION AND ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION	B 3/4 3-1
3/4.3.3 MONITORING INSTRUMENTATION	B 3/4 3-3
3/4.3.4 TURBINE OVERSPEED PROTECTION	B 3/4 3-6
3/4.3.5 SHUTDOWN MARGIN MONITOR	B 3/4 3-7
<u>3/4.4 REACTOR COOLANT SYSTEM</u>	
3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION	B 3/4 4-1
3/4.4.2 SAFETY VALVES	B 3/4 4-2
3/4.4.3 PRESSURIZER	B 3/4 4-2
3/4.4.4 RELIEF VALVES	B 3/4 4-2
3/4.4.5 STEAM GENERATORS	B 3/4 4-3
3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE	B 3/4 4-4
3/4.4.7 CHEMISTRY	B 3/4 4-5
3/4.4.8 SPECIFIC ACTIVITY	B 3/4 4-5
3/4.4.9 PRESSURE/TEMPERATURE LIMITS	B 3/4 4-7

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

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

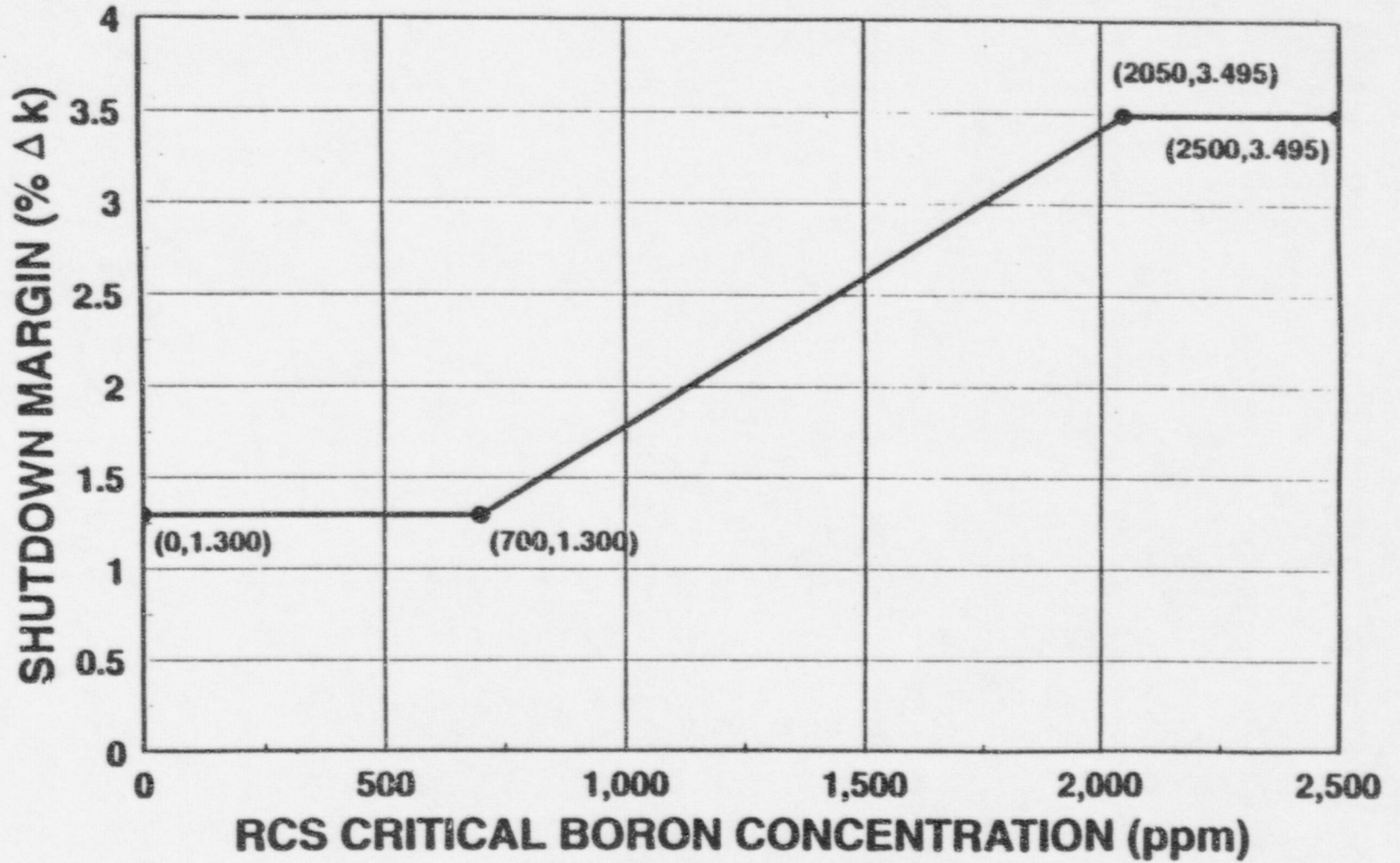


FIGURE 3.1-1

REQUIRED SHUTDOWN FOR MODE 3 WITH FOUR LOOPS IN OPERATION

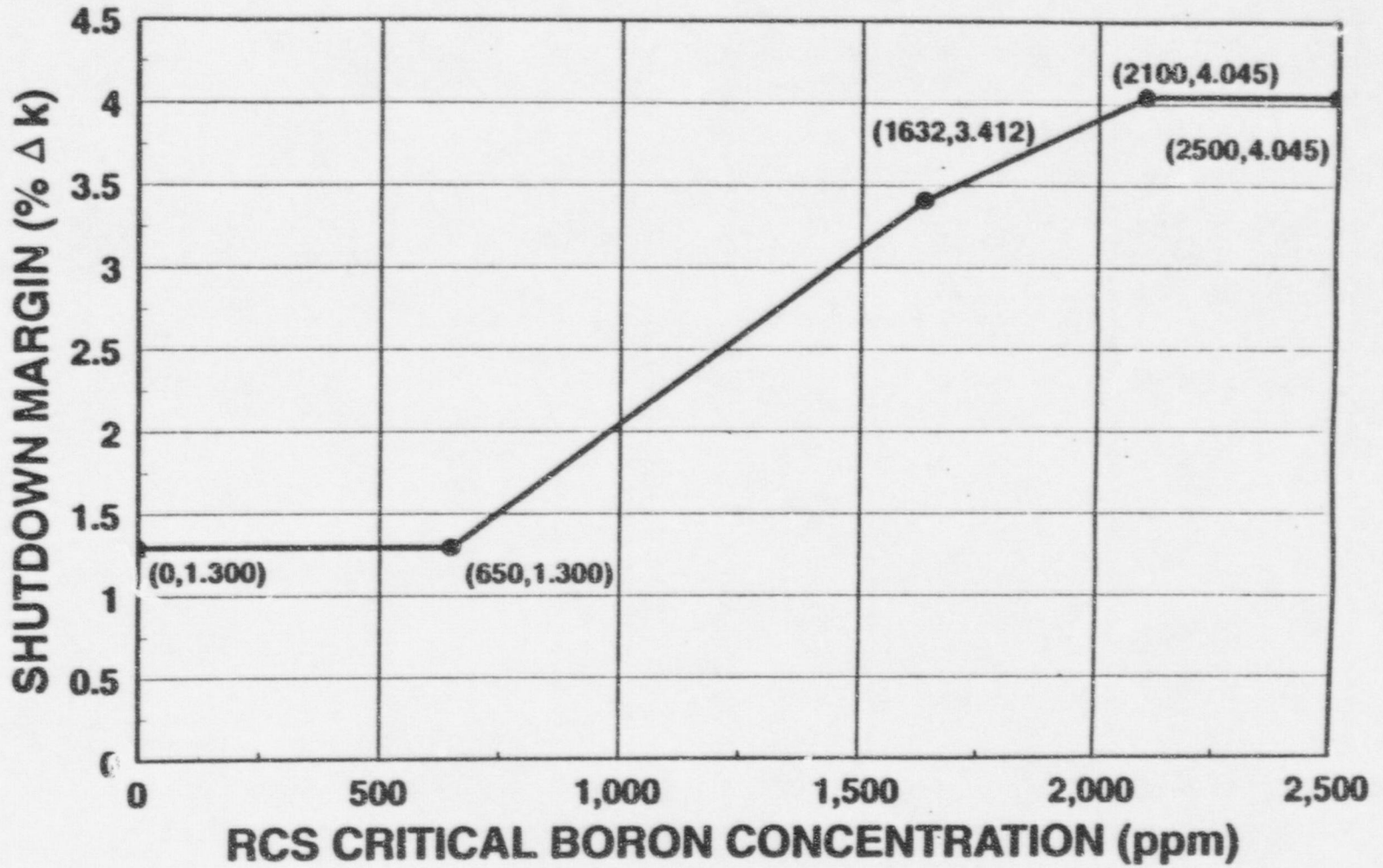


FIGURE 3.1-2

REQUIRED SHUTDOWN MARGIN FOR MODE 3 WITH THREE LOOPS IN OPERATION

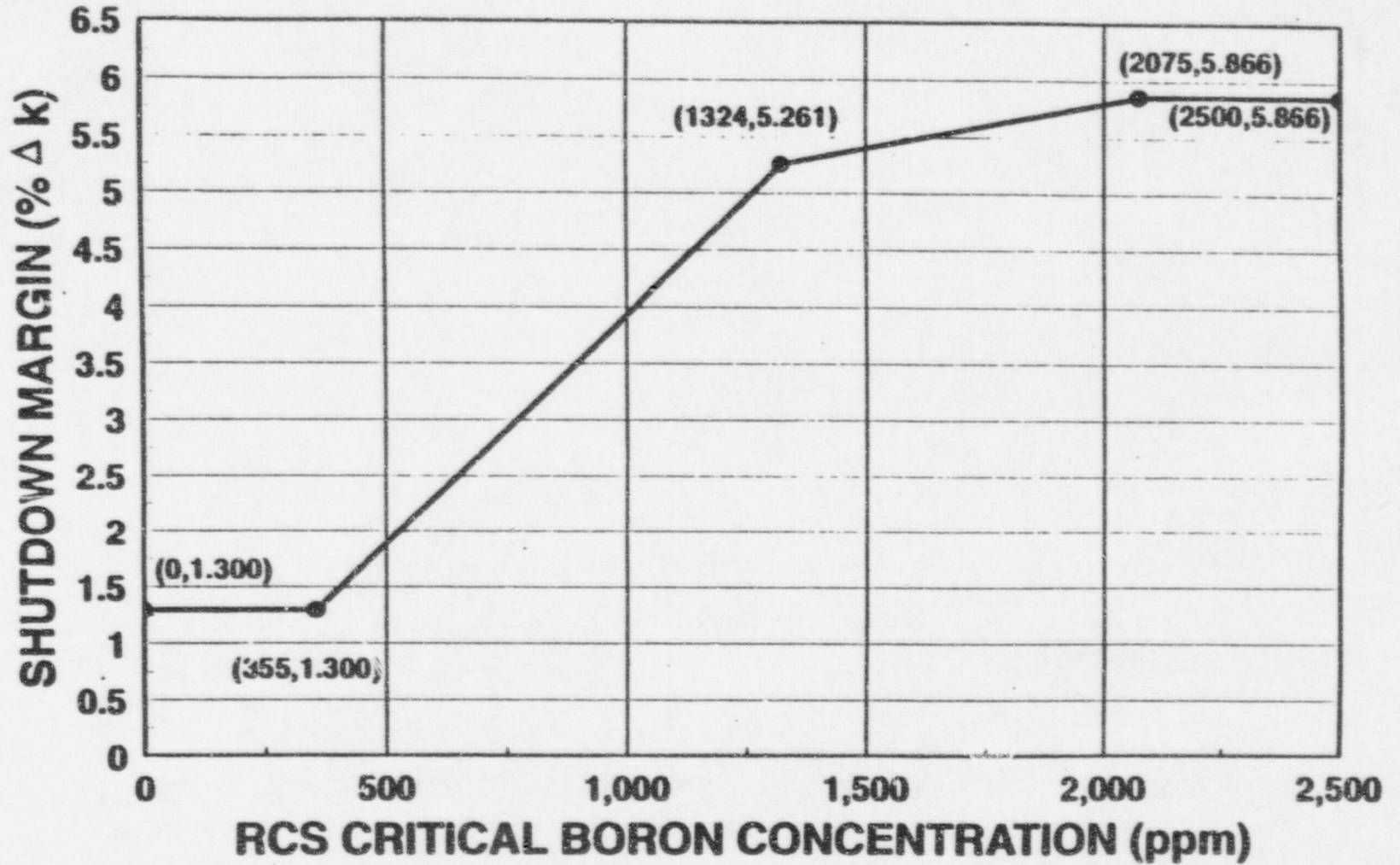


FIGURE 3.1-3

REQUIRED SHUTDOWN MARGIN FOR MODE 4

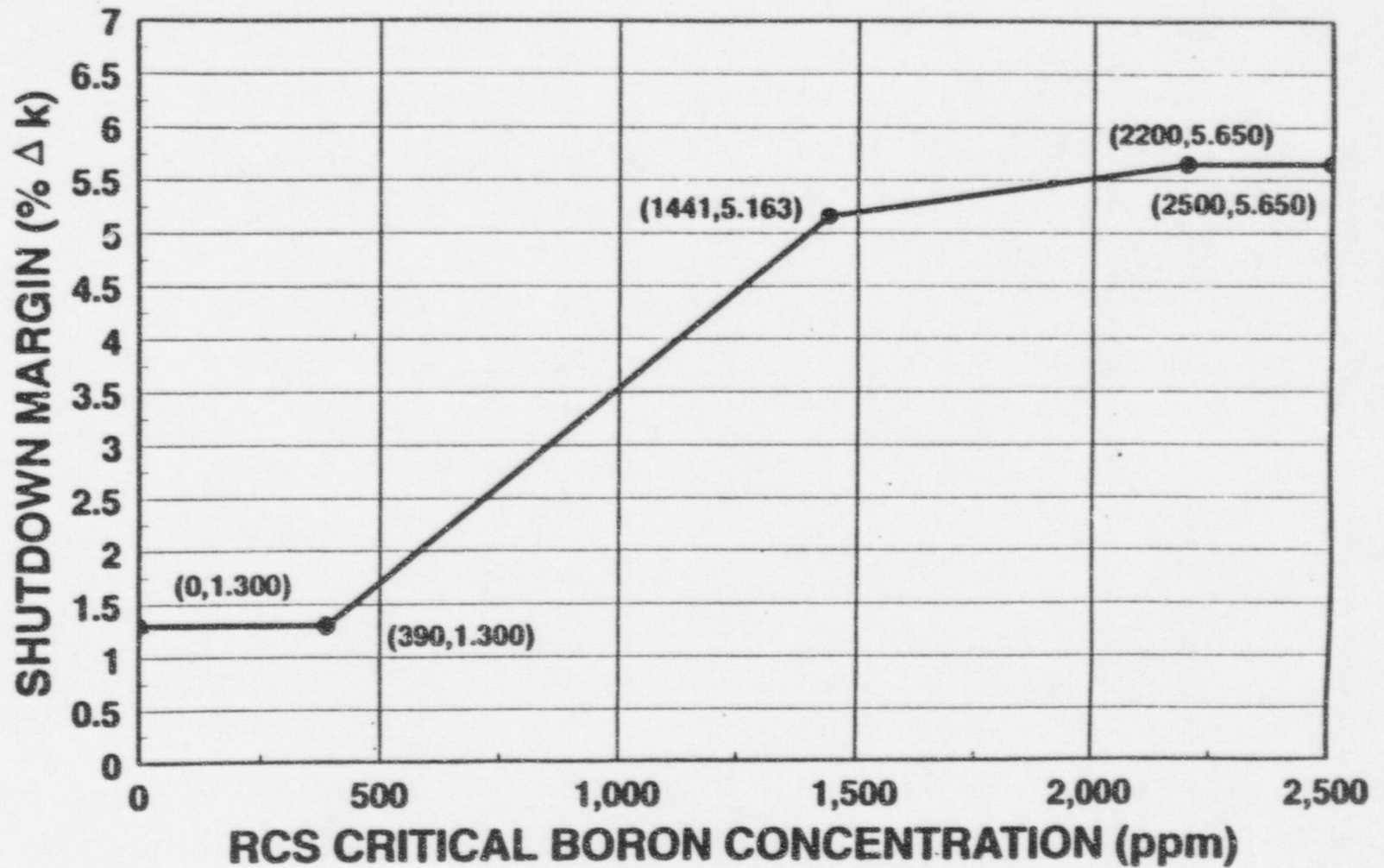


FIGURE 3.1-4

REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOCPS FILLED

REACTIVITY CONTROL SYSTEMS

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*, with 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,

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

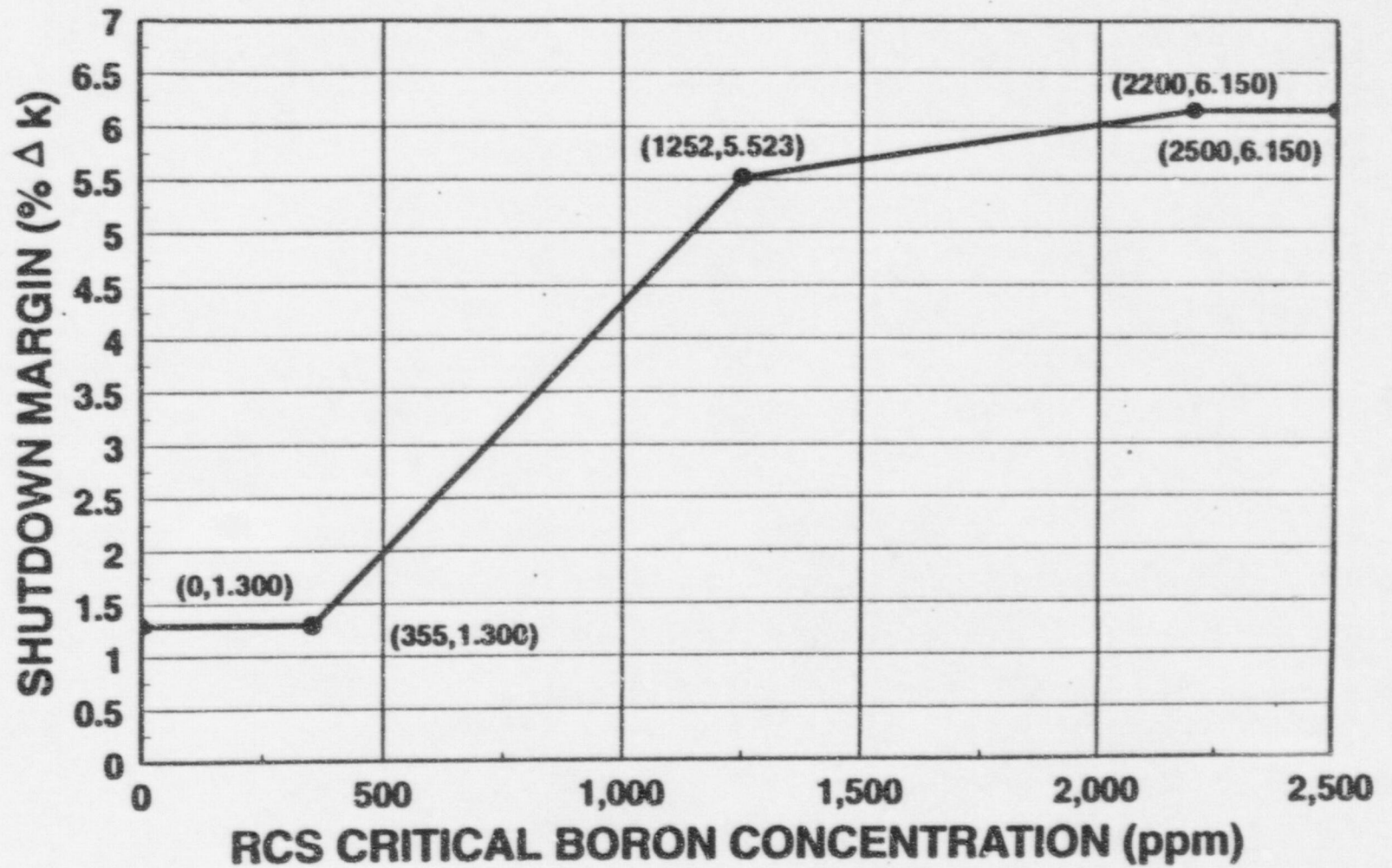


FIGURE 3.1-5
REQUIRED SHUTDOWN MARGIN FOR MODE 5 WITH RCS LOOPS NOT FILLED

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
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 2	1 1	2 2	1, 2 3*, 4*, 5*	10, 13 11
19. Automatic Trip and Interlock Logic	2 2	1 1	2 2	1, 2 3*, 4*, 5*	13A 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					

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

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>ANALOG CHANNEL OPERATIONAL TEST</u>	<u>TRIP ACTUATING DEVICE OPERATIONAL TEST</u>	<u>ACTUATION LOGIC TEST</u>	<u>MODES FOR WHICH SURVEILLANCE IS REQUIRED</u>
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						

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.

INSTRUMENTATION

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.

* 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.

INSTRUMENTATION

3/A.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.

REACTIVITY CONTROL SYSTEMS

BASES

BORATION SYSTEMS (Continued)

MARGIN from expected operating conditions of 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 RCS temperature below 200°F, 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 and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

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.

INSTRUMENTATION

BASES

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.

INSTRUMENTATION

BASES

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.

BASES (continued)

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.

BASES (continued)

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.

ADMINISTRATIVE CONTROLS

CORE OPERATING LIMITS REPORT (Cont.)

8. WCAP-11946, "Safety Evaluation Supporting a More Negative EOL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station Unit 3," September 1988 (W Proprietary).
9. WCAP-10054-P-A, "WESTINGHOUSE SMALL BREAK ECCS EVALUATION MODEL USING THE NOTRUMP CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)
10. WCAP-10079-P-A, "NOTRUMP - A NODAL TRANSIENT SMALL BREAK AND GENERAL NETWORK CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)
11. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)
12. Letter from V. L. Rooney (USNRC) to J. F. Opeka, "Safety Evaluation for Topical Report, NUSCO-152, Addendum 4, 'Physics Methodology for PWR Reload Design,' TAC No. M91815," July 18, 1995.

Attachment 4

Millstone Nuclear Power Station Unit No. 3
Proposed Revision to Technical Specification
Shutdown Margin Requirements and Shutdown Margin Monitor Operability
for Modes 3, 4 and 5
PTSCR 3-16-97
Background and Safety Assessment

May 1997

Background

The Shutdown Margin Monitor (SMM) measures neutron flux during reactor shutdown conditions. The purpose of this monitor is to identify any statistically significant increase in count rate that would indicate a loss of reactor shutdown margin. From the applicable analysis (e.g., Boron Dilution Event), the increase in neutron flux is determined for which an alarm is required and therefore, an alarm setpoint can be selected that gives the operator sufficient time to stop an unplanned loss of shutdown margin. The alarm function is credited in the current Boron Dilution Event analyses for Modes 3, 4 and 5. Based on Reg. Guide 1.7C, the minimum available operator action time for Modes 3, 4 and 5 must be greater than or equal to 15 minutes.

In performing its function, the SMM continually monitors the neutron count rate and multiplies the count rate by the Alarm Ratio in order to determine the Alarm Setpoint. The Alarm Ratio is determined by the position of a switch on the SMM. The Alarm Setpoint is updated so that the lowest previous value is used for monitoring purposes.

As discussed below, the current and revised analyses assume that the alarm occurs at the time of count rate doubling. If the indicated count rate were identical to the actual count rate during the loss of shutdown margin event, then an Alarm Ratio of 2.0 would be appropriate and consistent with the analysis. However, a time lag exists between the indicated count rate and the actual count rate due to the method of calculating the indicated count rate. The lower the initial count rate, the slower the indicated count rate will follow the actual count rate. Additionally, the actual count rate is a statistically varying signal and therefore, an additional uncertainty is introduced to ensure that there is a 99% probability that the alarm will be initiated.

Therefore, to account for the lag between the indicated and actual count rates and the statistical variations in the signal, the Alarm Ratio must be set at a conservative value (< 2.0) to be consistent with the analyses of the Boron Dilution Event. Also, a minimum acceptable initial count rate must be established to ensure that the Shutdown Monitor will function in a manner which is consistent and conservative with regard to the analysis.

The re-analysis of the Boron Dilution Event to support this Technical Specification change was performed by Westinghouse. This re-analysis assumed additional time delays in the alarm provided by the SMM relative to the initiation of a limiting boron dilution event. These additional time delays resulted in increased Shutdown Margin requirements, as well as requiring minimum SMM count rate values to be specified, to ensure that the boron dilution analysis remains bounding.

LER 96-009-00, submitted on 5/21/96, first identified that a minimum SMM count rate needed to be specified to ensure that the boron dilution analysis remained bounding. Because of the potential for the SMM to become inoperable solely due to decreased

count rates from long outages, NNECO submitted to the NRC on June 3, 1996, a request for the SMM to be exempt from LCO 3.0.4, so that it was permissible to go to higher operating modes with the SMM inoperable. The NRC approved this request in Amendment 131 on November 14, 1996.

The re-analysis of the Boron Dilution Event to support this Technical Specification change is intended to provide additional conservatism in the boron dilution analysis, so that the SMM's will remain operable at low count rates, except during very long outages. This will ensure that minimum reliance is made on the SMM exemption from LCO 3.0.4.

Current Shutdown Margin Monitor Status

While unrelated to this proposed revision to the Technical Specifications, for completeness, it should also be noted that Northeast Utilities recently under 10CFR50.59 declared the SMMs operable for SMM count rates as low as 0.38 counts/sec. This was documented in LER 96-009-02, submitted on March 24, 1997. The current and proposed boron dilution analysis assumed a conservative Inverse Count Rate Ratio (ICRR) curve which will bound the response of the SMM's for expected conditions of core loading configuration and outage length/neutron count rate decrease. The analysis to lower the minimum SMM count rates and justify current operability of the SMM's used a less limiting (but still conservative) ICRR curve. This was possible because the neutron sources eventually reached a condition of being essentially inactive due to the long outage in progress. This was an interim measure for this outage only.

Safety Assessment

Current Boron Dilution Event Analysis

The analysis of the Boron Dilution Event is provided in the Millstone 3 FSAR Chapter 15.4.6 (Chemical and Volume Control System Malfunction that Results in a Decrease in the Boron Concentration in the Reactor Coolant). The current analysis of record was performed by Westinghouse in support of the upgrade to VANTAGE 5H fuel. The analyses were performed to bound Cycle 4 operation in Modes 1 through 5. The analysis was not performed for Mode 6 since a dilution event during refueling is precluded by administrative controls.

For Modes 3, 4 and 5, the Boron Dilution Event analyses apply to the following five conditions:

- Mode 3 -- N Loop,
- Mode 3 -- N-1 Loop,
- Mode 4,
- Mode 5 -- RCS Filled,
- Mode 5 -- RCS Loops Not Filled.

Analyses were performed to define the minimum shutdown requirements for each of these conditions. These shutdown margin requirements ensure that the minimum time requirement of 15 minutes is met for the time from alarm/indication to the loss of shutdown margin.

The SMM is used to provide an alarm if there is an increase in count rate that would indicate a loss of reactor shutdown margin. As noted previously, the initial/minimum count rate (at the start of a boron dilution event) and the Alarm Ratio are important parameters to assure that the operation of the Shutdown Monitor is consistent with the analysis.

In summary, the Shutdown Margin requirements for Modes 3, 4 and 5 are provided in the current Technical Specification Figures 3.1-1, 3.1-2, 3.1-3, 3.1-4 and 3.1-5. These requirements assure that the operator has a minimum of 15 minutes from the alarm to loss of shutdown margin during an assumed Boron Dilution Event.

Revised Boron Dilution Event Analysis

Re-analyses of the Boron Dilution Event have recently been performed by Westinghouse. The re-analyses assumed additional SMM time delays, which were greater than those assumed in the current analysis of record for the Mode 3, 4 and 5 conditions. The re-analyses, with increased SMM delay times, result in revised shutdown margin/boration requirements which are more limiting than the current requirements; however, they provide operating margin in allowing the SMM to be considered operable at lower initial count rates.

The Shutdown Margin requirements provided by Westinghouse assume an additional SMM delay in the Mode 3, 4 and 5 re-analyses. The use of these revised Shutdown Margin requirements and the lower allowed count rate continues to assure that the operator will have at least 15 minutes to mitigate the consequences of a Boron Dilution Event. The additional SMM delay times included in the Boron Dilution Event analyses resulted in revised Technical Specification curves for Modes 3, 4 and 5 (Figures 3.1-1, 3.1-2, 3.1-3, 3.1-4 and 3.1-5) of Shutdown Margin vs. RCS Critical Boron Concentration. As expected, the revised requirements are more restrictive since an additional SMM time delay was included in the analyses.

Additional re-analyses of the Boron Dilution Event were performed by Westinghouse with SMM delay times, which are more conservative (larger) than that used to develop the revised Shutdown Margin requirements. The results of these re-analyses were used to develop the additional boration values which are included in Specification 3/4.3.5. This specification directs the boration of the RCS above the Shutdown Margin requirements in Figures 3.1-1 to 3.1-5 in order to allow for the SMM to be considered operable for count rates which are lower than allowed by implementation of only the Figures 3.1-1 to 3.1-5 requirements. The additional boration values included in Specification 3/4.3.5 are 150

ppm for Mode 3 (to be added to the requirement in Figure 3.1-1 and 3.1-2) and 350 ppm for Modes 4 and 5 (to be added to the requirement in Figures 3.1-3, 3.1-4 and 3.1-5).

The proposed Shutdown Margin requirements for Modes 3, 4 and 5 (Figures 3.1-1, 3.1-2, 3.1-3, 3.1-4 and 3.1-5 and LCO 3.3.5) will continue to assure that the operator has a minimum of 15 minutes from the alarm to loss of shutdown margin during an assumed Boron Dilution Event and also allow the SMM to be considered operable for count rates which are currently allowed. Values of the minimum count rate and Shutdown Margin alarm ratio required for operability will be specified in the Core Operating Limits Report (COLR).

The Boron Dilution Event analysis is documented in FSAR Chapter 15.4.6. The proposed Technical Specification changes are based on the Westinghouse re-analyses of the Boron Dilution Event. As such, the re-analyses will become the "analysis of record" for the Boron Dilution Event in Modes 3, 4 and 5.

Description of Technical Specification Changes

Pages 3/4 1-3 and 8 (Revised), Figures 3.1-1 to 3.1-5 (Revised) and Specification 3/4 3.5 (Added)

The proposed changes related to the revised Shutdown Margin requirements (Figures 3.1-1 to 3.1-5) and the Shutdown Margin Monitor operability (Specification 3.3.5) are based on re-analyses of the Boron Dilution Event for Modes 3, 4 and 5 performed by Westinghouse. In the re-analyses, assumptions were revised in order to provide two separate sets of Shutdown Margin requirements for Modes 3, 4 and 5. The two sets of Shutdown Margin requirements and the manner in which they are used for this Technical Specification change were summarized in this Attachment.

Additionally, a footnote (*) is added to Specifications 3.1.1.1.2 and 3.1.1.2 to note that additional Shutdown Margin requirements are given in Specification 3.3.5.

In summary, the results of the Westinghouse re-analyses provide the following Technical Specification revisions:

- More limiting Shutdown Margin requirements in Figures 3.1-1 to 3.1-5 are added which allow for the SMM to be considered operable for lower count rates in Modes 3, 4 and 5.
- Additional boration values included in Specification 3.3.5 which are to be applied to the Shutdown Margin requirements in Figures 3.1-1 to 3.1-5. The addition of Shutdown Margin above the requirements in the Figures allows the SMM to be considered operable for count rates which are lower than allowed by implementation of only the Figures 3.1-1 to 3.1-3-5 requirements.

Specification 3/4.3.5 is added which includes the Limiting Condition for Operation (LCO) and Surveillance Requirements for the SMM. This LCO refers to the COLR in order to specify the minimum count rate/alarm ratio requirements for SMM operability (LCO 3.3.5.a). These requirements are a function of the Shutdown Margin which has been established (i.e., requirements of Figures 3.1-1 to 3.1-5 or additional boration as per LCO 3.3.5.b). Additionally, Specification 3/4.3.5 includes Actions and Surveillance Requirements which are based on the current requirements in Table 3.3-1 (Functional Unit 21) and Table 4.3-1 (Functional Unit 22) for the SMM. Also, a footnote (***) is included in Specification 3/4.3.5 to make the Specification treatment of the valves consistent with the Mode 6 and Mode 5 loops drained requirements.

Deletion of Shutdown Margin Monitor Requirements in Tables 3.3-1 and 4.3-1

The addition of Specification 3/4.3.5 allows deletion of the guidance related to the SMM in Tables 3.3-1 and 4.3-1. Specifically, Functional Unit No. 21 (Shutdown Margin Monitor) and the related Notation (@) and Action Statement (ACTION 5) are deleted from Table 3.3-1 since these Specifications are provided in LCO 3.3.5. Also, the related Surveillance Requirements (Table 4.3-1 and Notation 19) are deleted. Without these deletions there would be redundant guidance between Tables 3.3-1/4.3-1 and the Technical Specification (Section 3/4.3.5) which is to be added.

Bases 3/4.1.2 (Revised)

In Bases 3/4.1.2 (Boration Systems), the Reference to Technical Specification Figure 3.1-5 (Shutdown Margin for Mode 5/drained) is changed to Figure 3.1-4 (Shutdown Margin for Mode 5/filled). This change makes the Bases consistent with the ACTION statement requirements of Technical Specifications 3.1.2.2 and 3.1.2.6.

Bases 3/4.3.1 (Revised and Moved to Bases Section 3/4.3.5)

The BASES for the Shutdown Margin Monitors in BASES Section 3/4.3.1 is moved to the added BASES Section 3/4.3.5. This Bases information is also revised to be consistent with the added Specification 3/4.3.5.

Bases 3/4.3.5 (Added)

Bases 3/4.3.5 (Shutdown Margin Monitor) is added to support the added Specification (3/4.3.5).

Section 6.9.1.6.b (Revised)

Reference 12 is added to the list of references in Section 6.9.1.6.b to include the NRC Safety Evaluation Report for NUSCO-152, Addendum 4 in the list of NRC approved analytical methods. This topical report describes the nuclear physics methodology used by NUSCO for PWR reload design. The addition of this reference is not related

to or required by the changes proposed for the Shutdown Margin requirements or Shutdown Margin Monitors.

In summary, this change results in the revision to Shutdown Margin requirements (Section 3/4.1.1, Tables 3.1-1 to 3.1-5), the addition of Specification 3/4.3.5 and its BASES, the revisions to Tables 3.3-1 and Table 4.3-1 and the revision to BASES Section 3/4.1.2. The changes provide consistent guidance regarding Shutdown Margin requirements and SMM operability in Modes 3, 4 and 5. Also, a footnote (***) is included in Specification 3/4.3.5 to make the Specification treatment of the valves consistent with the Mode 6 and Mode 5-loops drained requirements.

The Shutdown Margin requirements are specified in Figures 3.1-1 to 3.1-5 and LCO 3.3.5 (additional boration) and the related SMM minimum count rate and Alarm Ratio requirements will be provided in the plant COLR.

The changes to the Technical Specifications and the related Westinghouse re-analyses of the Boron Dilution Event will not adversely affect the assumptions or results of other FSAR accident analysis and it is concluded that this change is safe. The changes do not adversely affect any equipment credited in the safety analysis. Also, there is no impact on the margin of safety as specified in the Technical Specifications.

Based on the above, the proposed Technical Specification changes are safe.

Docket No. 50-423
B16447

Attachment 5

Millstone Nuclear Power Station Unit No. 3
Proposed Revision to Technical Specification
Shutdown Margin Requirements and Shutdown Margin Monitor Operability
for Modes 3, 4 and 5
PTSCR 3-16-97
Significant Hazards Consideration and Environmental Consideration

May 1997

Significant Hazards Consideration

NN JO has reviewed the proposed changes in accordance with 10CFR 50.92 and has concluded that the change does not involve a significant hazards consideration (SHC). The bases for this conclusion is that the three criteria of 10CFR 50.92(c) are not satisfied. The proposed changes do not involve a SHC because the changes would not:

1. Involve a significant increase in the probability or consequence of an accident previously evaluated.

The proposed Technical Specification changes will revise the current shutdown margin requirements for Modes 3, 4 and 5 in Figures 3.1-1, 3.1-2, 3.1-3, 3.1-4 and 3.1-5 and allow for additional boration of the RCS as directed by Specification 3.3.5. The new Shutdown Margin requirements are based on re-analyses of the Boron Dilution Event provided by Westinghouse. In the re-analyses, assumptions were modified in order to justify the operability of the Shutdown Margin Monitor for count rates which are lower than currently allowed. The proposed Shutdown Margin requirements for Modes 3, 4 and 5 will continue to assure that the operator has a minimum of 15 minutes from the alarm to loss of shutdown margin during an assumed Boron Dilution Event.

The proposed change also adds Technical Specification 3/4.3.5 to provide the LCO and Surveillance Requirements for the Shutdown Margin Monitors. LCO 3.3.5 refers to the Core Operating Limits Report (COLR) which will specify the minimum count rate/alarm ratio requirements in order to consider the Shutdown Margin Monitors operable. The LCO also directs the additional boration of the RCS in order to allow the Shutdown Margin Monitors to be considered operable for lower count rates. Also, a footnote (***) is included in Specification 3/4.3.5 to make the Specification treatment of the valves consistent with the Mode 6 and Mode 5- loops drained requirements.

Due to the addition of Technical Specification 3/4.3.5, the related Bases information is added as BASES Section 3/4.3.5. Additionally, the Bases information for the Shutdown Margin Monitors which is currently in BASES Section 3/4.3.1 is moved to the added BASES Section 3/4.3.5. This Bases information is also revised to be consistent with the added Specification 3/4.3.5.

Also, due to the addition of Technical Specification 3/4.3.5, the guidance related to the Shutdown Margin Monitor in Tables 3.3-1 and 4.3-1 is deleted to avoid redundancy.

Additionally, Section 3/4.1.2 of the Bases is revised so that it refers to Figure 3.1-4 (Shutdown Margin for Mode 5/filled) instead of Figure 3.1-5 (Shutdown Margin for Mode 5/drained). This change will make the Bases consistent with

the ACTION statement requirements of Technical Specifications 3.1.2.2 and 3.1.2.6.

Finally, Reference 12 (NUSCO-152, Addendum 4) is added to the list of references in Section 6.9.1.6.b. The addition of this reference is considered administrative and is not related to or required by the changes proposed for the Shutdown Margin requirements or Shutdown Margin Monitors

The new requirements for increased Shutdown Margin (Figures 3.1-1 to 3.1-5) and additional boration (LCO 3.3.5) continue to assure that the operator will have a response time of at least 15 minutes to mitigate the consequences of a Boron Dilution Event. The implementation of the new requirements does not alter the alignment of any plant equipment and therefore, the change cannot increase the probability or consequences of any previously analyzed accident.

The proposed changes will not adversely affect the assumptions or results of other FSAR accident analysis and it is concluded that this change is safe. The changes do not adversely affect any equipment credited in the safety analysis.

Based upon the re-analyses of the boron dilution event, revised plant operating requirements (shutdown margin) are generated to maintain the required operator action time. Therefore, there is no effect on the probability of occurrence or consequences of previously evaluated accidents.

Therefore, the proposed changes do not involve a significant increase in the probability or consequence of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed Shutdown Margin requirements for Modes 3, 4 and 5 (Figures 3.1-1 to 3.1-5 and additional boration as per Specification 3.3.5) will continue to assure that the operator has a minimum of 15 minutes from the alarm to loss of shutdown margin during an assumed Boron Dilution Event. Additionally, the use of these revised requirements allows the Shutdown Margin Monitor to be considered operable for count rates which are lower than currently allowed.

The changes do not introduce any new failure modes or malfunctions since the changes implement revised, more conservative plant operating requirements (shutdown margin) which are based on re-analyses of the Boron Dilution Event. Also, the changes do not eliminate any existing requirements.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety.

The proposed Shutdown Margin requirements for Modes 3, 4 and 5 (Figures 3.1-1 to 3.1-3) and additional boration as per Specification 3.3.5) will continue to assure that the operator has a minimum of 15 minutes from the alarm to loss of shutdown margin during an assumed Boron Dilution Event. Additionally, the use of these revised requirements allows the Shutdown Margin Monitor to be considered operable for count rates as low which are lower than currently allowed.

The re-analyses of the Boron Dilution Event demonstrated that the required operator action time is maintained. As such, the re-analyses will become the "analysis of record" for the Boron Dilution Event in Modes 3, 4 and 5. The Boron Dilution Event analysis is documented in FSAR Chapter 15.4.6.

The re-analyses of the Boron Dilution Event and the proposed revisions to the Technical Specifications do not adversely affect the results of the current FSAR accident analysis and therefore, it is concluded that this change is safe. Additionally, the change does not adversely affect any equipment credited in the safety analysis.

The changes do not have an adverse impact on the protective boundaries and there is no reduction in the margin of safety as specified in the Technical Specifications. Thus, this proposed change does not involve a significant reduction in the margin of safety.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

In conclusion, based on the information provided, it is determined that the proposed changes do not involve an SHC.

Environmental Considerations

NNECO has reviewed the proposed license amendment against the criteria of 10CFR 51.22 for environmental considerations. The proposed changes do not involve a SHC, do not significantly increase the type and amounts of effluents that may be released off site, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, NNECO concludes that the proposed changes meet the criteria delineated in 10CFR 51.22(c)(9) for categorical exclusion from the requirements of an environmental impact statement.