Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

August 31, 2000

TVA-SQN-TS-00-05 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATION (TS) CHANGE NO. 00-05, "RELOCATION OF REACTIVITY CONTROL REQUIREMENTS TO THE TECHNICAL REQUIREMENTS MANUAL (TRM) IN ACCORDANCE WITH 10 CFR 50.36"

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA is submitting a request for an amendment to SQN's Licenses DPR-77 and 79 to change the TSs for Units 1 and 2. The proposed change will relocate the current requirements for boration systems and the shutdown portion of the position indication system to the TRM. These relocated specifications are consistent with the functions that have been moved to 10 CFR 50.59 controlled documents in the latest version of standard TSs (NUREG-1431). The affected functions have been evaluated in accordance with 10 CFR 50.36 for applicability to the criteria for requirements that must be retained in the TSs. In each case, the four criteria of 10 CFR 50.36 did not apply to these functions. This revision will provide better consistency between the SQN TSs and NUREG-1431.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The SQN Plant

A001

Operations Review Committee and the SQN Nuclear Safety Review Board have reviewed this proposed change and determined that operation of SQN Units 1 and 2, in accordance with the proposed change, will not endanger the health and safety of the public. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter to the Tennessee State Department of Public Health.

Enclosure 1 to this letter provides the description and evaluation of the proposed change. This includes TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review. Enclosure 2 contains copies of the appropriate TS pages from Units 1 and 2 marked up to show the proposed change.

This is not a risk informed TS change request and no commitments are associated with the proposed request. TVA does not require special processing of the proposed TS change and no specific need date for approval has been identified. TVA requests that the revised TS be made effective within 45 days of NRC approval. If you have any questions about this change, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

Subscribed and sworn to before me
on this 31st day of August

Peggy M. Billingsley
Notary Public

My Commission Expires October 9, 2002

Enclosures
cc: See page 3

cc (Enclosures):

Mr. R. W. Hernan, Project Manager
Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Mr. Lawrence E. Nanney, Director (w/o Enclosures)
Division of Radiological Health
Third Floor
L&C Annex
401 Church Street
Nashville, Tennessee 37243-1532

NRC Resident
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy-Daisy, Tennessee 37384-2000

Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303-3415

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2
DOCKET NOS. 327 AND 328

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE 00-05
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED CHANGE

The proposed revision to the SQN TSs for Units 1 and 2 will relocate specifications that are not required to be contained in the TSs in accordance with 10 CFR 50.36. These specifications include Specifications 3.1.2.1 and 3.1.2.2 for boration flow paths, Specifications 3.1.2.3 and 3.1.2.4 for boration charging pumps, Specifications 3.1.2.5 and 3.1.2.6 for borated water sources, Specification 3.1.3.3 for position indication systems during shutdown, and Specification 3.10.5 for special test exceptions for the position indication system. These specifications will be relocated in their entirety to the Technical Requirements Manual (TRM) without change to the requirements currently contained within TSs. One exception is Specification 3.10.5, which is deleted without a corresponding addition to the TRM. The Bases associated with these specifications will be relocated to the TRM to support the proposed revisions. Necessary changes to the index pages have been included to denote the deletion of these specifications from the TSs.

II. REASON FOR THE PROPOSED CHANGE

The proposed revision removes specifications that are not required to be contained in the TSs in accordance with the criteria in 10 CFR 50.36. The inclusion of these specifications in the TSs places an unnecessary burden on TVA and the regulators for processing licensing amendments and in consideration of consistency with the standard TSs (NUREG-1431). The relocation of these specifications will place them in the TRM, which is a 10 CFR 50.59 controlled document, that provides an appropriate level of review and approval for the revision of functions that are important to safety but do not satisfy the criterion found in 10 CFR 50.36 for TS requirements. The proposed revision will reduce TVA and NRC activities for functions that were not intended to be controlled as TS requirements while maintaining an appropriate level of requirement control and an improved level of consistency with NUREG-1431.

III. SAFETY ANALYSIS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) an emergency power supply from operable diesel generators. The TSs require that at least one flow path is available for boron injection when in Modes 4, 5, and 6. The TSs require redundant boration capability when in Modes 1, 2, and 3. The capability of such injection is adequate to ensure the shutdown margin can be maintained after xenon decay and cooldown.

Two separate systems are provided to sense and display control rod position. The first is the analog rod position indication system (RPIS) that uses an analog signal that is produced for each rod cluster control assembly by a linear variable transformer. Direct continuous readout of every rod cluster control assembly position is presented to the operator by individual meter indications without need for operator selection or switching to determine rod position. A rod bottom (rod drop) alarm is provided. The second system is the demand position indication system (DPIS). This system counts pulses generated in the rod drive control system to provide a readout of the demanded bank position.

The DPIS and RPIS are separate systems with each serving as backup for the other. Operating procedures require the reactor operator to compare the demand and (actual) readings upon recognition of any apparent malfunction. Therefore, a single failure in rod position indication does not in itself lead the operator to take erroneous action in the operation of the reactor.

The proposed relocation of the affected specifications only places the current requirements into an acceptable alternative document that maintains the same requirements. The primary difference is that the revision for these specifications are now controlled in accordance with 10 CFR 50.59, which is acceptable for functions that do not meet the criterion of 10 CFR 50.36. The 10 CFR 50.59 requirements ensure that changes to these provisions that are not consistent with the design basis of the plant are evaluated and verified to maintain the health and safety of the public. If this cannot be assured, review and approval by NRC is required prior to implementation. The following evaluations, in accordance with 10 CFR 50.36, demonstrate the lack of applicability for inclusion in the TSs for the functions proposed for relocation.

The proposed revision relocates six specifications for boration systems to the TRM and are combined in the following evaluation for 10 CFR 50.36 criterion applicability:

1. **Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.**

   The boration systems of the Chemical and Volume Control System (CVCS) provide the means to meet one of the functional requirements of the CVCS to control the chemical neutron absorber (boron) concentration in the reactor coolant system (RCS) and to help maintain the shutdown margin. To accomplish this functional requirement the current specifications require a source of borated water, one or more flow paths to inject this borated water into the RCS, and appropriate charging pumps to provide the necessary charging head.

   The boration system is not assumed to be operable to mitigate the consequences of a design basis accident (DBA) or transient. In the case of a malfunction of the CVCS, which causes a boron dilution event, the automatic response, or that required by the operator, is to close the appropriate valves in the reactor makeup system. This action is required before the shutdown margin is lost. Operation of the boration systems is not assumed to mitigate this event.

   The boration systems do not include installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the RCS pressure boundary; therefore, these systems do not satisfy Criterion 1.

2. **A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.**

   The boration systems are not considered to be an initial condition assumed for a DBA or transient analysis. While they function to help maintain acceptable boration level in the RCS, the accident analysis assumptions for RCS boron is not directly related to the operability of these systems. Therefore, the boration systems do not satisfy Criterion 2.

3. **A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission produce barrier.**

   The boration systems are not assumed or credited for the mitigation of DBAs in the Sequoyah analysis. Injection of concentrated boron through the boration systems can help minimize the consequences of accidents but are not specifically assured to be available for mitigation. Therefore, the boration systems are not a primary success path for the mitigation of DBAs or transients and do not satisfy Criterion 3.

4. **A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.**

   Evaluation of the boration systems and operating experience has not determined this system to be a significant contributor to the health and safety of the public. Portions of these systems operate to perform functions that are significant contributors and are addressed by other specifications in the TSs. In addition, other methods are available to provide boration of the RCS to mitigate accidents or maintain acceptable level during normal operation and are also included in the TSs. Therefore, the boration systems are not significant as shown by operating experience and probabilistic risk assessment and do not satisfy Criterion 4.

The following evaluation addresses the 10 CFR 50.36 applicability for the position indication system during shutdown conditions:

1. **Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.**

   The control rod position indication system provides indication of rod position to the operator. This indication is used by the operator to verify that the rods are correctly positioned, and to verify that the rods are inserted into the core following a reactor trip. Rod position indication is also used during reactor startup.

   The position indication system does not include installed instrumentation that is used to detect, and

indicate in the control room, a significant abnormal degradation of the RCS pressure boundary; therefore, it does not satisfy Criterion 1.

2. **A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.**

   The position indication system, during shutdown, provides indication that control rods are fully inserted or the associated rod position during system testing or rod drop verifications. This indication does not support an initial condition of a DBA or transient during shutdown conditions. Therefore, the position indication system does not satisfy Criterion 2.

3. **A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission produce barrier.**

   The position indication system does not function to mitigate DBAs in the Sequoyah analysis. This system provides indication of rod position to allow an operator to take appropriate actions for misalignment situations. This indication system has no automatic function for accident mitigation or is credited to indicate necessary actions for accident mitigation. Therefore, the position indication system is not a primary success path for the mitigation of DBAs or transients and does not satisfy Criterion 3.

4. **A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.**

   Evaluation of the position indication system and operating experience has not determined this system to be a significant contributor to the health and safety of the public. While the position indication system provides rod position information, this system does not perform an automatic initiation function and other means are available to detect conditions for rod misalignment. Therefore, the position indication system is not significant as shown by operating experience and probabilistic risk assessment and does not satisfy Criterion 4.

The deletion of Specification 3.10.5 is proposed to eliminate a special test exception that should have been eliminated in a previous amendment to the SQN TSs. This exception was related to Specification 3.1.3.3 originally when the position indication function was satisfied by the analog RPIS. Since then, TVA has requested and received NRC approval of an amendment to rely on the DPIS for this function because of inherent inaccuracies in the RPIS at the ends of the indication range. After implementation of this amendment, the exception in Specification 3.10.5 was no longer valid because the instrumentation utilized in Specification 3.1.3.3 no longer included the analog RPIS for which the special test exception is applicable. Therefore, the provisions of Specification 3.10.5 are no longer necessary or of value and this specification is not proposed for relocation to another document. This is acceptable because Specification 3.1.3.3 is fully adequate without reliance on this provision both currently and after the proposed relocation to the TRM.

The proposed revisions to relocate the boration systems and the shutdown portion of the position indication system discussed above will not remove provisions required to be maintained by TSs. This has been demonstrated in the 10 CFR 50.36 evaluations provided above. These provisions will be relocated with the same requirements in the TRM with the exception of the special test exception in Specification 3.10.5. This exception is not currently used and will not affect the functions of the relocated specifications or other TS requirements. Therefore, the proposed relocation of these specifications is acceptable from a nuclear safety standpoint and implementation of this revision will not impact the health and safety of the public.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA has concluded that operation of SQN Units 1 and 2, in accordance with the proposed change to the technical specifications (TSs), does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

The proposed revision to the SQN TSs for Units 1 and 2 will relocate specifications that are not required to be contained in the TSs in accordance with 10 CFR 50.36. These specifications include those specifications for boration flow paths, boration charging pumps, borated water sources, position indication systems during shutdown, and special test exceptions for the position indication system. These specifications are relocated in their entirety to the Technical Requirements Manual

(TRM) without change to the requirements currently contained within TSs. One exception is that the special test exception specification is deleted without a corresponding addition to the TRM. The Bases associated with these specifications have also been relocated to the TRM to support the proposed revisions.

A. **The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.**

The proposed revision relocates the boration specifications and one rod position indication system specification without a change to the requirements and deletes a special test exception for rod position indication that is no longer applicable to SQN. Relocation to the TRM continues to provide an acceptable level of applicability to plant operation and requires revisions to be processed in accordance with the provisions in 10 CFR 50.59. Evaluations of revisions in accordance with 10 CFR 50.59 will continue to ensure that these specifications adequately control the functions for boration and rod position indication systems to maintain safe operation of the plant. The boration systems and the rod position indication system is not postulated to be the initiator of a design basis accident. Since there are no changes to these functions and their operation will remain the same, the probability of an accident is not increased by relocating these requirements to the TRM. Additionally, the accident mitigation capability and offsite dose consequences associated with accidents will not change because these functions will not be altered by the proposed relocation. Therefore the consequences of an accident are not increased by this relocation to the TRM and the control of revisions to these specifications in accordance with 10 CFR 50.59.

B. **The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The proposed revision will not alter the functions for the boration or the rod position indication systems such that accident potential would be changed. The location of these specifications in the TRM and the performance of revisions in accordance with 10 CFR 50.59 will continue to maintain acceptable operability requirements. Therefore, the possibility of an accident of a new or different kind

is not created by the proposed relocation and deletion.

C. **The proposed amendment does not involve a significant reduction in a margin of safety.**

The proposed specification relocation and special test deletion will not affect plant setpoints or functions that maintain the margin of safety. This is based on the relocation to the TRM continuing to maintain the same level of operability requirements and surveillance testing to adequately ensure functionality of the boration and rod position indication systems. Control of TRM requirements in accordance with 10 CFR 50.59 will ensure that revisions to these functions will not inappropriately impact the health and safety of the public without prior review and approval by NRC. Therefore, the proposed relocation and deletion is acceptable and will not reduce the margin of safety.

V. ENVIRONMENTAL IMPACT CONSIDERATION

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
SEQUOYAH PLANT (SQN)
UNITS 1 AND 2

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE
MARKED PAGES

I. AFFECTED PAGE LIST

Unit 1	Unit 2
Index Page IV	Index Page IV
Index Page X	Index Page XI
Index Page XII	Index Page XII
Index Page XV	Index Page XV
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 1-10	3/4 1-10
3/4 1-11	3/4 1-11
3/4 1-11a	3/4 1-11a
3/4 1-12	3/4 1-12
3/4 1-13	3/4 1-13
3/4 1-13a	3/4 1-13a
3/4 1-18	3/4 1-18
3/4 10-5	3/4 10-5
B 3/4 1-2	B 3/4 1-2
B 3/4 1-3	B 3/4 1-3
B 3/4 10-1	B 3/4 10-1

II. MARKED PAGES

See attached.

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION	PAGE
3/4.0 APPLICABILITY	3/4 0-1
3/4.1 REACTIVITY CONTROL SYSTEMS	
3/4.1.1 BORATION CONTROL	
Shutdown Margin - T_{avg} greater than 200°F	3/4 1-1
Shutdown Margin - T_{avg} less than or equal to 200°F	3/4 1-3
Moderator Temperature Coefficient	3/4 1-4
Minimum Temperature for Criticality	3/4 1-6
3/4.1.2 BORATION SYSTEMS	
Flow Paths - Shutdown (DELETED)	3/4 1-7
Flow Paths - Operating (DELETED)	3/4 1-~~8~~7
Charging Pump - Shutdown (DELETED)	3/4 1-~~9~~7
Charging Pumps - Operating (DELETED)	3/4 1-~~10~~7
Borated Water Sources - Shutdown (DELETED)	3/4 1-~~11~~7
Borated Water Sources - Operating (DELETED)	3/4 1-~~12~~7
3/4.1.3 MOVABLE CONTROL ASSEMBLIES	
Group Height	3/4 1-14
Position Indication Systems - Operating	3/4 1-17
Position Indication Systems - Shutdown (DELETED)	3/4 1-18
Rod Drop Time	3/4 1-19
Shutdown Rod Insertion Limit	3/4 1-20
Control Rod Insertion Limits	3/4 1-21

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE	
	MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION (DELETED)	3/4 8-17	R254
	ISOLATION DEVICES (DELETED)	3/4 8-20	
3/4.9 REFUELING OPERATIONS			
3/4.9.1	BORON CONCENTRATION	3/4 9-1	
3/4.9.2	INSTRUMENTATION	3/4 9-2	
3/4 9.3	DECAY TIME	3/4 9-3	
3/4.9.4	CONTAINMENT BUILDING PENETRATIONS	3/4 9-4	
3/4.9.5	COMMUNICATIONS	3/4 9-5	
3/4.9.6	MANIPULATOR CRANE	3/4 9-6	
3/4.9.7	CRANE TRAVEL - SPENT FUEL PIT AREA (DELETED)	3/4 9-7	R208
3/4.9.8	RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION		
	ALL WATER LEVELS	3/4 9-8	
	LOW WATER LEVEL	3/4 9-8a	
3/4.9.9	CONTAINMENT VENTILATION ISOLATION SYSTEM	3/4 9-9	
3/4.9.10	WATER LEVEL - REACTOR VESSEL	3/4 9-10	
3/4.9.11	SPENT FUEL PIT WATER LEVEL	3/4 9-11	
3/4.9.12	AUXILIARY BUILDING GAS TREATMENT SYSTEM	3/4 9-12	
3/4.10 SPECIAL TEST EXCEPTIONS			
3/4.10.1	SHUTDOWN MARGIN	3/4 10-1	
3/4.10.2	GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS	3/4 10-2	
3/4.10.3	PHYSICS TESTS	3/4 10-3	
3/4.10.4	REACTOR COOLANT LOOPS	3/4 10-4	
3/4.10.5	POSITION INDICATION SYSTEM - SHUTDOWN (DELETED)	3/4 10-5	

INDEX

BASES

SECTION PAGE

3/4.0 APPLICABILITY ..... B 3/4 0-1

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL ..... B 3/4 1-1

3/4.1.2 BORATION SYSTEMS. (DELETED) ..... B 3/4 1-2

3/4.1.3 MOVABLE CONTROL ASSEMBLIES ..... B 3/4 1-3

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AXIAL FLUX DIFFERENCE ..... B 3/4 2-1

3/4.2.2 and 3/4.2.3 HEAT FLUX AND NUCLEAR ENTHALPY HOT CHANNEL FACTORS ..... B 3/4 2-1

3/4.2.4 QUADRANT POWER TILT RATIO ..... B 3/4 2-4 R142

3/4.2.5 DNB PARAMETERS ..... B 3/4 2-4

3/4.3 INSTRUMENTATION

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES INSTRUMENTATION ..... B 3/4 3-1

3/4.3.3 MONITORING INSTRUMENTATION ..... B 3/4 3-2

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION ..... B 3/4 4-1

3/4.4.2 and 3/4.4.3 SAFETY AND RELIEF VALVES ..... B 3/4 4-1

3/4.4.4 PRESSURIZER ..... B 3/4 4-2

3/4.4.5 STEAM GENERATORS ..... B 3/4 4-2

MAY 08 1990

INDEX

BASES

SECTION		PAGE
3/4.9.10	and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND SPENT FUEL PIT	B 3/4 9-3
3/4.9.12	AUXILIARY BUILDING GAS TREATMENT SYSTEM	B 3/4 9-3
3/4.10 SPECIAL TEST EXCEPTIONS		
3/4.10.1	SHUTDOWN MARGIN	B 3/4 10-1
3/4.10.2	GROUP HEIGHT, INSERTION, AND POWER DISTRIBUTION LIMITS	B 3/4 10-1
3/4.10.3	PHYSICS TESTS	B 3/4 10-1
3/4.10.4	REACTOR COOLANT LOOPS	B 3/4 10-1
3/4 10.5	POSITION INDICATION SYSTEM-SHUTDOWN (DELETED)	B 3/4 10-1
3/4.11 RADIOACTIVE EFFLUENTS		
3/4.11.1	LIQUID EFFLUENTS	B 3/4 11-1
3/4.11.2	GASEOUS EFFLUENTS	B 3/4 11-1 R152
3/4.11.3	DELETED	B 3/4 11-2
3/4.11.4	DELETED	B 3/4 11-2
3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING		
3/4.12.1	DELETED	B 3/4 12-1
3/4.12.2	DELETED	B 3/4 12-1
3/4.12.3	DELETED	B 3/4 12-1

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

DELETE

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.1 ~~As a minimum, one of the following boron injection flow paths shall be OPERABLE:~~

a. A flow path from the boric acid tank via a boric acid transfer pump and charging pump to the Reactor Coolant System if only the boric acid storage tank in Specification 3.1.2.5a is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if only the refueling water storage tank in Specification 3.1.2.5b is OPERABLE.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

MODE 4 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one flow path as soon as possible.

MODES 5 and 6 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

R161

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source.

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

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

R176

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.2 ~~At least two of the following three boron injection flow paths shall be OPERABLE:~~

a. The flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System.

b. Two flow paths from the refueling water storage tank via charging pumps to the Reactor Coolant System. R161

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours. R161

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.2 At least two of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source. R176

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

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

d. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal. R176

e. At least once per 18 months by verifying that the flow path required by Specification 3.1.2.2a delivers at least 35 gpm to the Reactor Coolant System. R176

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.3 ~~One charging pump in the boron injection flow path required by~~ Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE shutdown board.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

MODE 4 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one charging pump as soon as possible. R161

MODES 5 and 6 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.3 The above required charging pump shall be demonstrated OPERABLE by verifying, that on recirculation flow, the pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to Specification 4.0.5.

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.4 ~~At least two charging pumps shall be OPERABLE.~~

APPLICABILITY: MODES 1, 2, and 3. R161

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours. R161

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.4 At least two charging pumps shall be demonstrated OPERABLE by verifying, that on recirculation flow, each pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to Specification 4.0.5.

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

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

a. A boric acid storage system with: R176

1. A minimum contained borated water volume of 5000 gallons,

2. Between 6120 and 6990 ppm of boron, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 55,000 gallons, R176

2. A minimum boron concentration of 2500 ppm, and

3. A minimum solution temperature of 60°F. R144

APPLICABILITY: MODES 4, 5 and 6. R176

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

DELETE

SURVEILLANCE REQUIREMENTS

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

a. For the boric acid storage system, when it is the source of borated water by: R176

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or

SURVEILLANCE REQUIREMENTS (Continued)

4. Whenever the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours and every 24 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

b. For the refueling water storage tank by: R176

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours while in Mode 4 or while in Modes 5 or 6 when it is the source of borated water.

DELETE

BORATED WATER SOURCES OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.6 ~~As a minimum, the following borated water source(s) shall be OPERABLE~~ as required by Specification 3.1.2.2:

a. A boric acid storage system with:

1. A contained volume of borated water in accordance with Figure 3.1.2.6, R176

2. A boron concentration in accordance with Figure 3.1.2.6, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A contained borated water volume of between 370,000 and 375,000 gallons,

2. Between 2500 and 2700 ppm of boron, R144

3. A minimum solution temperature of 60°F, and

4. A maximum solution temperature of 105°F.

DELETE

APPLICABILITY: MODES 1, 2, and 3. R176

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours. R176

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

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or R176

4. Whenever the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours and every 24 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

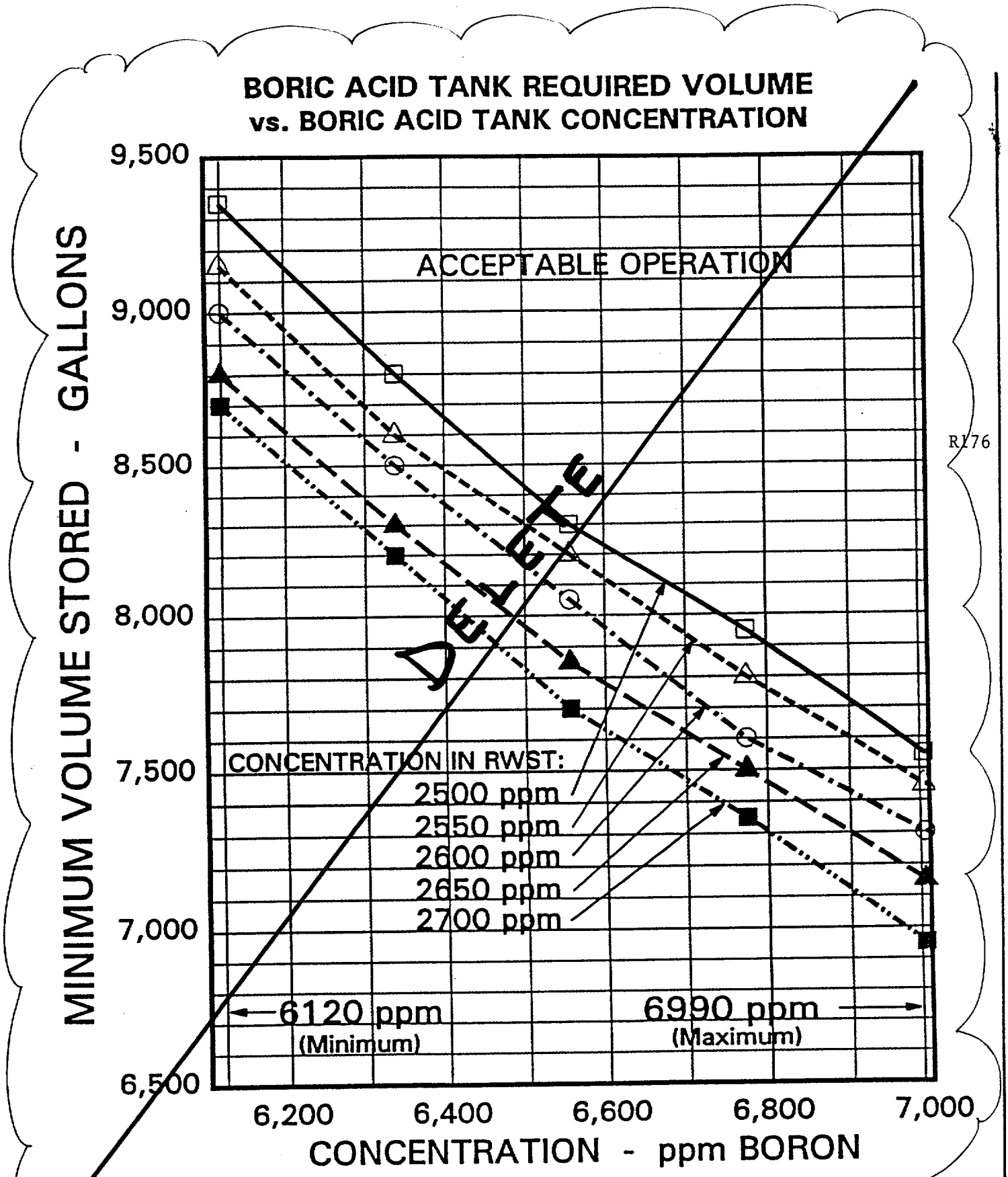
b. For the refueling water storage tank by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours.

DELETE



R176

FIGURE 3.1.2.6

POSITION INDICATION SYSTEM-SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.3.3 ~~The group demand position indicator shall be OPERABLE and capable of~~ determining within ± 2 steps, the demand position for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3*#, 4*# and 5*#.

ACTION:

With less than the above required group demand position indicator(s) OPERABLE, immediately open the reactor trip system breakers.

R30

DELETE

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each of the above required group demand position indicator(s) shall be determined to be OPERABLE by movement of the associated control rod at least 10 steps in any one direction at least once per 31 days.

*With the reactor trip system breakers in the closed position.

#See Special Test Exception 3.10.5.

3/4.10.5 POSITION INDICATION SYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.10.5 ~~The limitations of Specification 3.1.3.3 may be suspended during~~ the performance of individual full length (shutdown and control) rod drop time measurements provided;

a. Only one shutdown or control bank is withdrawn from the fully inserted position at a time, and

b. The rod position indicator is OPERABLE during the withdrawal of the rods.*

APPLICABILITY: MODES 3, 4 and 5 during performance of rod drop time measurements.

ACTION:

With the position indication system inoperable, or more than one bank of rods withdrawn, immediately open the reactor trip breakers.

DELETE

SURVEILLANCE REQUIREMENTS

4.10.5 The above required rod position indication systems shall be determined to be OPERABLE within 24 hours prior to the start of and at least once per 24 hours thereafter during rod drop time measurements by verifying the demand position indication system and the rod position indication systems agree:

a. Within 12 steps when the rods are stationary, and

b. Within 24 steps during rod motion.

* This requirement is not applicable during the initial calibration of the rod position indication system provided (1) K_{eff} is maintained less than or equal to 0.95, and (2) only one shutdown or control rod bank is withdrawn from the fully inserted position at one time. 1

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY R175

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 541°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the protective instrumentation is within its normal operating range, 3) the P-12 interlock is above its setpoint, 4) the pressurizer is capable of being in a OPERABLE status with a steam bubble, and 5) the reactor pressure vessel is above its minimum RT_{NDT} temperature.

3/4.1.2 BORATION SYSTEMS

THIS SPECIFICATION IS DELETED

~~The boron injection system ensures that negative reactivity control is~~ available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) an emergency power supply from OPERABLE diesel generators. R176

DELETE

With the RCS average temperature above 350°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.6% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at near EOL from full power peak xenon conditions and requires R176

borated water from a boric acid tank in accordance with TS Figure 3.1.2.6, and additional makeup from either: (1) the common boric acid tank and/or batching, or (2) a minimum of 26,000 gallons of 2500 ppm borated water from the refueling water storage tank. With the refueling water storage tank as the only borated water source, a minimum of 57,000 gallons of 2500 ppm borated water is required. R176

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.5% and 4.0% by weight. To ensure that the boric acid remains in solution, the air temperature is monitored in strategic locations. By ensuring the air temperature remains at 63°F or above, a 5°F margin is provided to ensure the boron will not precipitate out. To provide operational flexibility, if the area temperature should fall below the required value, the solution temperature (as determined by the pipe or tank wall temperature) will be monitored at an increased frequency to compensate for the lack of solution temperature alarm in the main control room.

With the RCS temperature below 350°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable. R161

The boron capability required below 350°F, is sufficient to provide a SHUTDOWN MARGIN of 1.6% delta k/k after xenon decay and cooldown from 350°F to 200°F, and a SHUTDOWN MARGIN of 1% delta k/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 5000 gallons of 6120 ppm borated water from the boric acid storage tanks or 13,400 gallons of 2500 ppm borated water from the refueling water storage tank. R176

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The 55,000 gallon limit in the refueling water storage tank for Modes 4, 5, and 6 is based upon 22,182 gallons that is undetectable due to lower tap location, 19,197 gallons for instrument error, 13,400 gallons required for shutdown margin, and an additional 221 gallons due to rounding up. R176

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.5 and 9.5 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 OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

DELETE

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of rod misalignment on associated accident analyses. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

3/4.10.1 SHUTDOWN MARGIN

This special test exception provides that a minimum amount of control rod worth is immediately available for reactivity control when tests are performed for control rod worth measurement. This special test exception is required to permit the periodic verification of the actual versus predicted core reactivity condition occurring as a result of fuel burnup or fuel cycling operations.

3/4.10.2 GROUP HEIGHT, INSERTION, AND POWER DISTRIBUTION LIMITS

This special test exception permits individual control rods to be positioned outside of their normal group heights and insertion limits during the performance of such PHYSICS TESTS as those required to 1) measure control rod worth and 2) determine the reactor stability index and damping factor under xenon oscillation conditions.

3/4.10.3 PHYSICS TESTS

This special test exception permits PHYSICS TESTS to be performed at less than or equal to 5% of RATED THERMAL POWER with the RCS T_{AVG} slightly lower than normally allowed so that the fundamental nuclear characteristics of the reactor core and related instrumentation can be verified. In order for various characteristics to be accurately measured it is, at times, necessary to operate outside the normal restrictions of these technical Specifications. For instance, to measure the moderator temperature coefficient at BOL it is necessary to position various control rods at heights which may not normally be allowed by Specification 3.1.3.6 which may cause the RCS T_{AVG} to fall slightly below the minimum temperature of Specification 3.1.1.4.

Testing performed pursuant to Specification 4.10.3.2 ensures that the intermediate and power range reactor trip functions which operate at less than or equal to 25% RATED THERMAL POWER are available to limit power excursions during PHYSICS TESTS. BR-2

3/4.10.4 REACTOR COOLANT LOOPS

This special test exception permits reactor criticality under no flow conditions and is required to perform certain startup and PHYSICS TESTS while at low THERMAL POWER levels.

3/4 10.5 POSITION INDICATION SYSTEM-SHUTDOWN

THIS SPECIFICATION IS DELETED.

~~This special test exception permits the position indication systems to be~~ inoperable during rod drop time measurements. The exception ~~is~~ required since the data necessary to determine the rod drop ~~time~~ is derived from the induced voltage in the position indicator coils as the rod is dropped. This induced voltage is small compared to the normal voltage and, therefore, can not be observed if the position indication systems remain OPERABLE.

DELETE

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION	PAGE
3/4.0 APPLICABILITY	3/4 0-1
3/4.1 REACTIVITY CONTROL SYSTEMS	
3/4.1.1 BORATION CONTROL	
Shutdown Margin - T_{avg} > 200°F	3/4 1-1
Shutdown Margin - ≤ 200°F	3/4 1-3
Moderator Temperature Coefficient	3/4 1-4
Minimum Temperature for Criticality	3/4 1-6
3/4.1.2 BORATION SYSTEMS	
Flow Path - Shutdown. (DELETED)	3/4 1-7
Flow Paths - Operating. (DELETED)	3/4 1-~~8~~7
Charging Pump - Shutdown. (DELETED)	3/4 1-~~9~~7
Charging Pumps - Operating. (DELETED)	3/4 1-~~10~~7
Borated Water Source - Shutdown. (DELETED)	3/4 1-~~11~~7
Borated Water Sources - Operating. (DELETED)	3/4 1-~~12~~7
3/4.1.3 MOVABLE CONTROL ASSEMBLIES	
Group Height	3/4 1-14
Position Indication Systems - Operating	3/4 1-17
Position Indication System - Shutdown. (DELETED)	3/4 1-18
Rod Drop Time	3/4 1-19
Shutdown Rod Insertion Limit	3/4 1-20
Control Rod Insertion Limits	3/4 1-21

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE
3/4.10.4	REACTOR COOLANT LOOPS	3/4 10-4
3/4.10.5	POSITION INDICATION SYSTEM - SHUTDOWN. (DELETED)	3/4 10-5
3/4.11	RADIOACTIVE EFFLUENTS	
3/4.11.1	LIQUID EFFLUENTS	
	Deleted	3/4 11-1
	Deleted	3/4 11-1
	Deleted	3/4 11-1
	Liquid Holdup Tanks	3/4 11-2 R134
3/4 11.2	GASEOUS EFFLUENTS	
	Deleted	3/4 11-3
	Deleted	3/4 11-3
	Deleted	3/4 11-3
	Deleted	3/4 11-3
	Explosive Gas Mixture	3/4 11-4
	Gas Decay Tanks	3/4 11-5
3/4 11.3	Deleted	3/4 11-6
3/4 11.4	Deleted	3/4 11-7
3/4.12	RADIOLOGICAL ENVIRONMENTAL MONITORING	
3/4.12.1	Deleted	3/4 12-1
3/4.12.2	Deleted	3/4 12-1
3/4.12.3	Deleted	3/4 12-1

NOV 16 1990

INDEX

BASES

SECTION PAGE

3/4.0 APPLICABILITY . . . . . B 3/4 0-1

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL . . . . . B 3/4 1-1

3/4.1.2 BORATION SYSTEMS (DELETED) . . . . . B 3/4 1-2

3/4.1.3 MOVABLE CONTROL ASSEMBLIES . . . . . B 3/4 1-3

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AXIAL FLUX DIFFERENCE (AFD) . . . . . B 3/4 2-1

3/4.2.2 and 3/4.2.3 HEAT FLUX AND NUCLEAR ENTHALPY HOT CHANNEL FACTORS . . . . . B 3/4 2-1 R130

3/4.2.4 QUADRANT POWER TILT RATIO . . . . . B 3/4 2-4

3/4.2.5 DNB PARAMETERS . . . . . B 3/4 2-4

3/4.3 INSTRUMENTATION

3/4.3.1 and 3/4.3.2 REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION . . . . . B 3/4 3-1

3/4.3.3 MONITORING INSTRUMENTATION . . . . . B 3/4 3-2

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION . . . . . B 3/4 4-1

3/4.4.2 and 3/4.4.3 SAFETY AND RELIEF VALVES . . . . . B 3/4 4-2

3/4.4.4 PRESSURIZER . . . . . B 3/4 4-2a

3/4.4.5 STEAM GENERATORS . . . . . B 3/4 4-3

INDEX

BASES

SECTION		PAGE
3/4.9.10	and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND SPENT FUEL PIT	B 3/4 9-3
3/4.9.12	AUXLIARY BUILDING GAS TREATMENT SYSTEM	B 3/4 9-3
3/4.10 SPECIAL TEST EXCEPTIONS		
3/4.10.1	SHUTDOWN MARGIN	B 3/4 10-1
3/4.10.2	GROUP HEIGHT, INSERTION, AND POWER DISTRIBUTION LIMITS	B 3/4 10-1
3/4.10.3	PHYSICS TESTS	B 3/4 10-1
3/4.10.4	REACTOR COOLANT LOOPS	B 3/4 10-1
3/4.10.5	POSITION INDICATION SYSTEM-SHUTDOWN (DELETED)	B 3/4 10-1
3/4.11 RADIOACTIVE EFFLUENTS		
3/4.11.1	LIQUID EFFLUENTS	B 3/4 11-1
3/4.11.2	GASEOUS EFFLUENTS	B 3/4 11-1
3/4.11.3	DELETED	B 3/4 11-2
3/4.11.4	DELETED	B 3/4 11-2 R134
3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING		
3/4.12.1	DELETED	B 3/4 12-1
3/4.12.2	DELETED	B 3/4 12-1
3/4.12.3	DELETED	B 3/4 12-1

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

DELETE

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.1 ~~As a minimum, one of the following boron injection flow paths shall be OPERABLE:~~

a. A flow path from the boric acid tank via a boric acid transfer pump and charging pump to the Reactor Coolant System if the boric acid storage tank in Specification 3.1.2.5a is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if the refueling water storage tank in Specification 3.1.2.5b is OPERABLE.

APPLICABILITY: MODES 4, 5 and 6.

ACTION: R147

MODE 4 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one flow path as soon as possible.

MODES 5 and 6 - With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source. R163

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

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

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.2 ~~At least two of the following three boron injection flow paths shall be OPERABLE:~~

a. The flow path from the boric acid tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System.

b. Two flow paths from the refueling water storage tank via charging pumps to the Reactor Coolant System.

APPLICABILITY: MODES 1, 2, and 3. R147

ACTION:

With only one of the above required boron injection flow paths to the Reactor Coolant System OPERABLE, restore at least two boron injection flow paths to the Reactor Coolant System to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two flow paths to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours. R147

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.2 At least two of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that the temperature of the areas containing flow path components from the boric acid tanks to the blending tee is greater than or equal to 63°F when it is a required water source. R163

b. Whenever the area temperature(s) is(are) less than 63°F and the boric acid tank is a required water source, the solution temperature in the flow path components from the boric acid tank must be measured to be greater than or equal to 63°F within 6 hours and every 24 hours thereafter until the area temperature(s) has(have) returned to greater than or equal to 63°F.

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

d. At least once per 18 months during shutdown by verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal. R163

e. At least once per 18 months by verifying that the flow path required by Specification 3.1.2.2a delivers at least 35 gpm to the Reactor Coolant System. R163

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.3 ~~One charging pump in the boron injection flow path required by~~ Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE shutdown board.

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

MODE 4 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and restore one charging pump as soon as possible. R147

MODES 5 and 6 - With no charging pump OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.3 The above required charging pump shall be demonstrated OPERABLE by verifying, that on recirculation flow, the pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to Specification 4.0.5.

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.4 ~~At least two charging pumps shall be OPERABLE.~~ R27

APPLICABILITY: Modes 1, 2, and 3. R147

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours.

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.4 At least two charging pumps shall be demonstrated OPERABLE by verifying, that on recirculation flow, each pump develops a discharge pressure of greater than or equal to 2400 psig when tested pursuant to Specification 4.0.5.

R147

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.5 ~~As a minimum, one of the following borated water sources shall be OPERABLE:~~ R163

a. A boric acid storage system with:

1. A minimum contained borated water volume of 5000 gallons,

2. Between 6120 and 6990 ppm of boron, and

3. A minimum solution temperature of 63°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 55,000 gallons, R163

2. A minimum boron concentration of 2500 ppm, and R131

3. A minimum solution temperature of 60°F.

APPLICABILITY: MODES 4, 5 and 6. R163

DELETE

ACTION:

With no borated water source OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

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

a. For the boric acid storage system, when it is the source of borated water by: R163

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or

SURVEILLANCE REQUIREMENTS (Continued)

4. Whenever the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours and every 24 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

b. For the refueling water storage tank by: R163

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours while in Mode 4 or while in Modes 5 or 6 when it is the source of borated water.

DELETE

BORATED WATER SOURCES OPERATING

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.2.6 ~~As a minimum, the following borated water source(s) shall be OPERABLE~~ as required by Specification 3.1.2.2:

a. A boric acid storage system with:

1. A contained volume of borated water in accordance with Figure 3.1.2.6,

2. A boron concentration in accordance with Figure 3.1.2.6, and

3. A minimum solution temperature of 63°F. R163

b. The refueling water storage tank with:

1. A contained borated water volume of between 370,000 and 375,000 gallons,

2. Between 2500 and 2700 ppm of boron, R131

3. A minimum solution temperature of 60°F, and

4. A maximum solution temperature of 105°F.

APPLICABILITY: MODES 1, 2, and 3. R163

ACTION:

a. With the boric acid storage system inoperable and being used as one of the above required borated water sources, restore the storage system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and borated to a SHUTDOWN MARGIN equivalent to at least 1% delta k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 30 hours. R163

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

DELETE

SURVEILLANCE REQUIREMENTS

4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

a. For the boric acid storage system, when it is the source of borated water by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the boric acid storage tank solution temperature is greater than or equal to 63°F at least once per 7 days by verifying the area temperature to be greater than or equal to 63°F, or

4. Whenever the boric acid tank area temperature is less than 63°F and the boric acid storage system being used as the source of borated water, within 6 hours and every 24 hours thereafter, verify the boric acid tank solution temperature to be greater than or equal to 63°F until the boric acid tank area temperature has returned to greater than or equal to 63°F.

b. For the refueling water storage tank by:

1. Verifying the boron concentration at least once per 7 days,

2. Verifying the borated water volume at least once per 7 days, and

3. Verifying the solution temperature at least once per 24 hours.

DELETE

R163

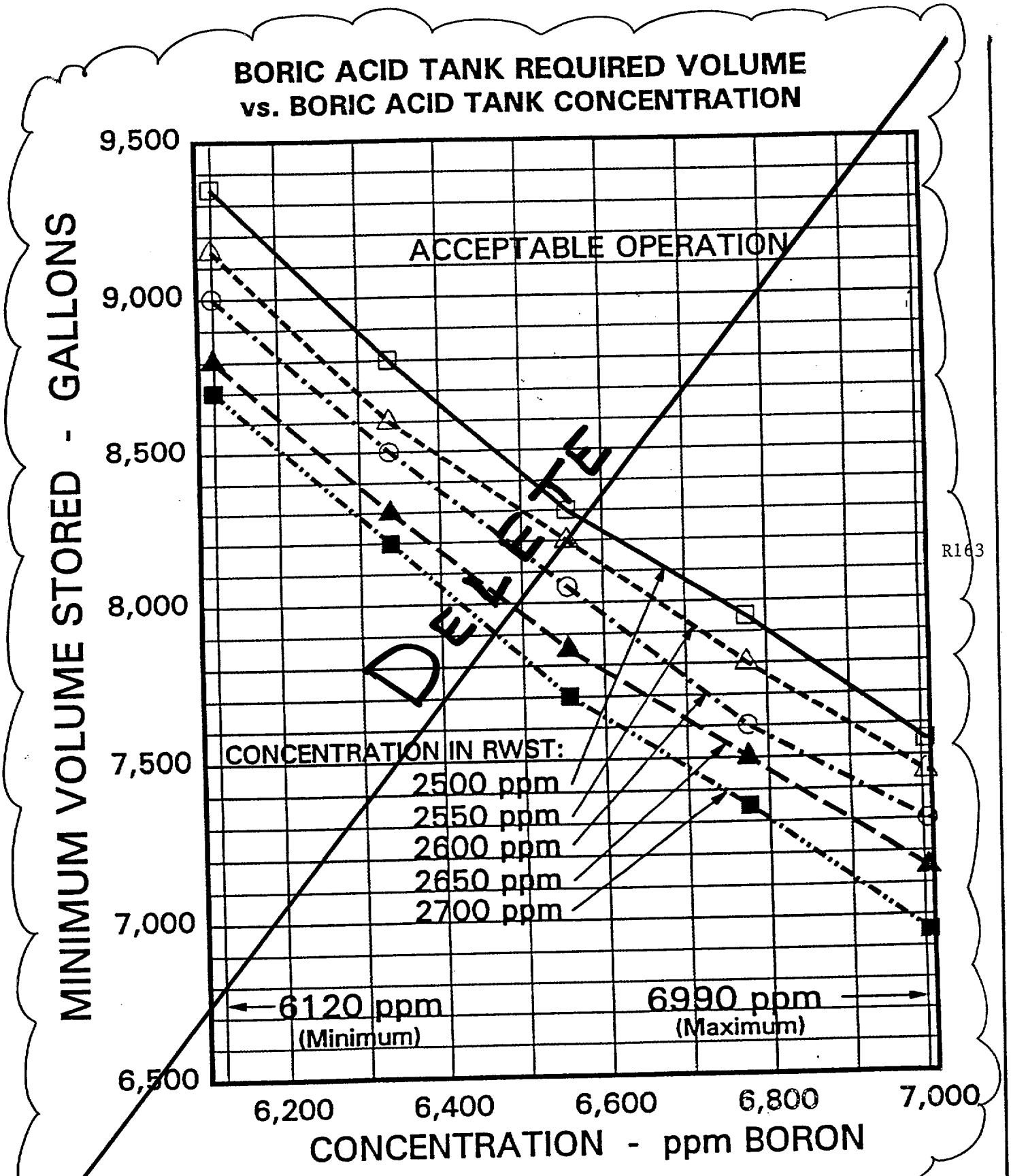


FIGURE 3.1.2.6

November 26, 1993
Amendment No. 163

POSITION INDICATION SYSTEM-SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.1.3.3 ~~The group demand position indication shall be OPERABLE and capable of~~ determining within ± 2 steps the demand position for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3*#, 4*# and 5*#.

ACTION:

With less than the above required group demand position indicator(s) OPERABLE, immediately open the reactor trip system breakers.

DELETE

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each of the above required group demand position indicator(s) shall be determined to be OPERABLE by movement of the associated control rod at least 10 steps in any one direction at least once per 31 days.

*With the reactor trip system breakers in the closed position.
#See Special Test Exception 3.10.5.

R15

3/4.10.5 POSITION INDICATION SYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

THIS SPECIFICATION IS DELETED.

3.10.5 ~~The limitations of Specification 3.1.3.3 may be suspended during the~~ performance of individual full length (shutdown and control) rod drop time measurements provided;

a. Only one shutdown or control bank is withdrawn from the fully inserted position at a time, and

b. The rod position indicator is OPERABLE during the withdrawal of the rods.*

APPLICABILITY: MODES 3, 4 and 5 during performance of rod drop time measurements.

ACTION:

With the position indication system inoperable, or with more than one bank of rods withdrawn, immediately open the reactor trip breakers.

DELETE

SURVEILLANCE REQUIREMENTS

4.10.5 The above required rod position indication systems shall be determined to be OPERABLE within 24 hours prior to the start of and at least once per 24 hours thereafter during rod drop time measurements by verifying the demand position indication system and the rod position indication systems agree:

a. Within 12 steps when the rods are stationary, and

b. Within 24 steps during rod motion.

---

* This requirement is not applicable during the initial calibration of the rod position indication system provided (1) K_{eff} is maintained less than or equal to 0.95, and (2) only one shutdown or control rod bank is withdrawn from the fully inserted position at one time.

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY R161

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 541°F. This limitation is required to ensure 1) the moderator temperature coefficient is within it analyzed temperature range, 2) the protective instrumentation is within its normal operating range, 3) the P-12 interlock is above its setpoint, 4) the pressurizer is capable of being in a OPERABLE status with a steam bubble, and 5) the reactor pressure vessel is above its minimum RT_{NDT} temperature.

3/4.1.2 BORATION SYSTEMS

THIS SPECIFICATION IS DELETED.

~~The boron injection system ensures that negative reactivity control is~~ available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, and 5) an emergency power supply from OPERABLE diesel generators. R163

DELETE

With the RCS average temperature above 350°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to R163

BORATION SYSTEMS (Continued)

provide a SHUTDOWN MARGIN from expected operating conditions of 1.6% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at near EOL from full power peak xenon conditions and requires borated water from a boric acid tank in accordance with TS Figure 3.1.2.6, and additional makeup from either: (1) the common boric acid tank and/or batching, or (2) a minimum of 26,000 gallons of 2500 ppm borated water from the refueling water storage tank. With the refueling water storage tank as the only borated water source, a minimum of 57,000 gallons of 2500 ppm borated water is required. R163

The boric acid tanks, pumps, valves, and piping contain a boric acid solution concentration of between 3.5% and 4.0% by weight. To ensure that the boric acid remains in solution, the air temperature is monitored in strategic locations. By ensuring the air temperature remains at 63°F or above, a 5°F margin is provided to ensure the boron will not precipitate out. To provide operational flexibility, if the area temperature should fall below the required value, the solution temperature (as determined by the pipe or tank wall temperature) will be monitored at an increased frequency to compensate for the lack of solution temperature alarm in the main control room.

With the RCS temperature below 350°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity changes in the event the single injection system becomes inoperable. R147

The boron capability required below 350°F is sufficient to provide a SHUTDOWN MARGIN of 1.6% delta k/k after xenon decay and cooldown from 350°F to 200°F, and a SHUTDOWN MARGIN of 1% delta k/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 5000 gallons of 6120 ppm borated water from the boric acid storage tanks or 13,400 gallons of 2500 ppm borated water from the refueling water storage tank. R163

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The 55,000 gallon limit in the refueling water storage tank for Modes 4, 5, and 6 is based upon 22,182 gallons that is undetectable due to lower tap location, 19,197 gallons for instrument error, 13,400 gallons required for shutdown margin, and an additional 221 gallons due to rounding up. R163

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.5 and 9.5 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. BR

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

DELETE

November 26, 1993

3/4.10.1 SHUTDOWN MARGIN

This special test exception provides that a minimum amount of control rod worth is immediately available for reactivity control when tests are performed for control rod worth measurement. This special test exception is required to permit the periodic verification of the actual versus predicted core reactivity condition occurring as a result of fuel burnup or fuel cycling operations.

3/4.10.2 GROUP HEIGHT, INSERTION, AND POWER DISTRIBUTION LIMITS

This special test exception permits individual control rods to be positioned outside of their normal group heights and insertion limits during the performance of such PHYSICS TESTS as those required to 1) measure control rod worth and 2) determine the reactor stability index and damping factor under xenon oscillation conditions.

3/4.10.3 PHYSICS TESTS

This special test exception permits PHYSICS TESTS to be performed at less than or equal to 5% of RATED THERMAL POWER with the RCS T_{AVG} slightly lower than normally allowed so that the fundamental nuclear characteristics of the reactor core and related instrumentation can be verified. In order for various characteristics to be accurately measured it is, at times, necessary to operate outside the normal restrictions of these technical Specifications. For instance, to measure the moderator temperature coefficient at BOL it is necessary to position various control rods at heights which may not normally be allowed by Specification 3.1.3.6 which may cause the RCS T_{AVG} to fall slightly below the minimum temperature of Specification 3.1.1.4.

Testing performed pursuant to Specification 4.10.3.2 ensures that the intermediate and power range reactor trip functions which operate at less than or equal to 25% RATED THERMAL POWER are available to limit power excursions during PHYSICS TESTS. BR-2

3/4.10.4 REACTOR COOLANT LOOPS

This special test exception permits reactor criticality under no flow conditions and is required to perform certain startup and PHYSICS TESTS while at low THERMAL POWER levels.

3/4 10.5 POSITION INDICATION SYSTEM-SHUTDOWN

THIS SPECIFICATION IS DELETED.

~~This special test exception permits the position indication systems to be~~ inoperable during rod drop time measurements. The exception is required since the data necessary to determine the rod drop time is derived from the induced voltage in the position indicator coils as the rod is dropped. This induced voltage is small compared to the normal voltage and, therefore, can not be observed if the position indication systems remain OPERABLE.

DELETE