TVA

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

March 13, 2003

TVA-SQN-TS-03-01 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 03-01, "REVISION OF BORON REQUIREMENTS FOR COLD LEG ACCUMULATORS AND REFUELING WATER STORAGE TANKS"

Pursuant to 10 CFR 50.90, TVA is submitting a request for a TS change (TSC 03-01) to licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed TS change will revise the limiting condition for operation for TS Section 3.5.1, "Cold Leg Injection Accumulators" and TS Section 3.5.5, "Refueling Water Storage Tank." This revision will modify the single boron concentration requirement by inserting a table that defines the minimum and maximum amount of boron that is required for accident mitigation based on the number of tritium producing rods in the core. Five different ranges of tritium producing rods are utilized in the tables with the corresponding boron values listed. A footnote is included in the proposed change that provides information about where the current number of tritium producing rods in the core can be found to support the use of the new table.

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TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The SQN Plant 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 and enclosures to the Tennessee State Department of Public Health. As part of the proposed license amendment request, no commitments have been made by TVA.

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 request has been applied to the pages previously approved by NRC in Amendments 278 and 269 for Units 1 and 2, respectively. These amendments were approved by NRC on September 30, 2002, but are not scheduled for implementation until tritium producing rods are loaded into the SQN reactors. At this time, the United States Department of Energy has not provided TVA with a schedule for the production of tritium at SQN and no special processing of this change is requested. TVA requests that the implementation of the proposed TS change be consistent with the refueling outage in which the tritium producing rods are loaded and the implementation of Amendments 278 and 269. This letter is being sent in accordance with NRC RIS 2001-05.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 13 day of March, 2003.

Enclosures:
1. TVA Evaluation of the Proposed Changes
2. Proposed Technical Specifications Changes (mark-up)

JDS:KCW:PMB
Enclosures
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ENCLOSURE 1

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

TVA Evaluation of the Proposed Change

1. DESCRIPTION

This letter is a request to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed TS change will revise the limiting condition for operation (LCO) for TS Section 3.5.1, "Cold Leg Injection Accumulators" and TS Section 3.5.5, "Refueling Water Storage Tank." This revision will modify the single boron concentration requirement by inserting a table that defines the minimum and maximum amount of boron that is required for accident mitigation based on the number of tritium producing rods in the core. This proposed change will allow the flexibility to adjust boron levels as necessary based on the number or tritium producing rods in the core. This will minimize cost and resources associated with the addition of large amounts of boron into these systems until the core loading requires the boron to support accident mitigation functions.

2. PROPOSED CHANGE

This amendment request will revise the LCO for TS Section 3.5.1, "Cold Leg Injection Accumulators" and TS Section 3.5.5, "Refueling Water Storage Tank." This revision will modify the single boron concentration requirement by inserting a table that defines the minimum and maximum amount of boron that is required for accident mitigation based on the number of tritium producing rods in the core. The maximum boron concentration has not changed from the currently approved value of 3800 parts per million (ppm) and applies to any number of tritium producing rods in the core within the limit of 2256 approved by NRC. Five different ranges of tritium producing rods are utilized in the tables with the corresponding boron values listed. A footnote is included in the proposed change that clarifies that the number of tritium producing rods in the core for a given cycle can be found in the Core Operating Limits Report. This footnote ensures that the specific number of rods can be identified for determining the amount of boron that is required.

This proposed change has been applied to the NRC approved and issued pages in SQN Amendments 278 and 269 for Units 1 and 2, respectively. These amendments addressed the changes needed for the production of tritium and included boron changes for the cold leg accumulators (CLAs) and refueling water storage tank (RWST).

These amendments will not be implemented into the SQN TSs until tritium producing rods are loaded into the reactor core. At this time, the United States Department of Energy has yet to inform TVA when it will be asked to begin the production of tritium at SQN. The proposed changes are only needed when the previously approved tritium amendments are implemented; therefore, it is more appropriate to apply these changes to the approved but not implemented TS pages. If approved, the proposed changes will be implemented in conjunction with the previously approved tritium production amendments.

In summary, the boron requirements for the CLAs and RWST will be modified to allow smaller boron increases consistent with safety considerations.

3. BACKGROUND

The minimum boron requirements for the CLA ensures that the reactor core will remain subcritical during the post-loss of coolant accident (LOCA) recirculation phase based upon the CLA's contribution to the post-LOCA sump mixture concentration. The functions and design of the CLAs are found in Section 6.3 of the SQN Updated Final Safety Analysis Report (UFSAR). The minimum boron requirements for the RWST ensures that sufficient negative reactivity is injected into the core to counteract any positive increase in reactivity caused by reactor coolant system (RCS) cooldown. The RWST serves several purposes in addition to the injection of borated water during accident conditions. These functions are described in various sections of the UFSAR. Some of these descriptions are included in Sections 6.2.2, 6.3, 9.1.3, 15.2.4, and 15.4.3.

The CLAs are required to be operable in Modes 1, 2 and 3 and the RWST in Modes 1, 2, 3, and 4. The LCO associated with these functions also include requirements for borated water volume. The CLA's specification has isolation valve and nitrogen cover-pressure requirements and the RWST specification includes requirements for temperature. These limitations all support the ability of the CLAs and RWST to replace water to keep the core cooled and to ensure that sufficient boron is available to maintain the reactor in a sub-critical condition during postulated accident conditions. The CLAs are passive devices that inject automatically when the RCS pressure drops below the accumulator's cover-pressure. The RWST provides borated water to the emergency core cooling system pumps for injection into the reactor. Three different sets of pumps are utilized to accommodate different size breaks in the RCS. The RWST also provides water to the containment spray systems to control containment pressure during high energy line break accidents.

When the injection of the RWST volume has been completed, the pumps switchover to the containment sump to continue the core cooling and containment pressure control functions.

4. TECHNICAL ANALYSIS

The proposed change provides boron concentration requirements for the CLAs and RWST that correlate to the number of tritium producing rods in the core. Framatome-Advanced Nuclear Power has performed calculations within the same constraints as used for the tritium production amendments. NRC approved and issued SQN Amendments 278 and 269 for Units 1 and 2, respectively, using this as the basis for the currently approved boron requirements for the CLAs and RWST. This methodology was reported in Topical Report BAW-10237, "Implementation and Utilization of Tritium Producing Burnable Absorber Rods (TPBARS) in Sequoyah Units 1 and 2," dated September 2001, and included as Enclosure 4 in TVA's TS Change Request 00-06, "Sequoyah Nuclear Plant (SQN) - Units 1 and 2 - Revision of Instrumentation Measurement Range, Boron Concentration Limits, Reactor Core Limitations, and Spent Fuel Pool Storage Requirements for Tritium Production Cores (TPCs) - Technical Specification (TS) Change No. 00-06," dated September 21, 2001. The methodology used for this effort is specifically described in Section 2.15.5.4 of this topical report.

Framatome's latest calculations were performed in November 2002, and considered four different ranges of TPBAR loading and one for no TPBARS. These ranges are 1 to 250 TPBARs, 251 to 500 TPBARs, 501-1000 TPBARs, and 1001 to 2256 TPBARs. The boron requirements for no TPBARs is the same as the currently implemented boron requirements for the CLAs and RWST in the SQN TSs. The one difference is that the maximum boron concentration has been increased based on considerations for boron plate out during the cold leg injection phase and the time interval for initiating hot leg recirculation for LOCAs. This maximum concentration is the same value that was approved for the tritium amendments by NRC and is acceptable with the decreased time interval for hot leg recirculation. The proposed boron requirements for 1001 to 2256 TPBARs is the same as the currently approved boron requirements for tritium production that were based on a maximum loading of 2256 TPBARs. The three ranges between these values were calculated in the same manner by taking into account the maximum number of TPBARs in the range and determining the amount of boron that will satisfy the safety function of the CLAs and RWST. The proposed boron concentration values ensure that the post-LOCA sump boron concentration is sufficient to prevent core re-criticality with the associated number of TPBARs in the core. The analysis for required boron considers the reactivity holddown effect associated with the additional reactivity poison caused by the TPBARs in the core and the boron needed to offset the effects of possible leaching of lithium following a LOCA. The results of this effort are as follows:

Number of TPBARs	Minimum CLA Boron	Maximum CLA Boron	Minimum RWST Boron	Maximum RWST Boron
0	2400 ppm	3800 ppm	2500 ppm	3800 ppm
1-250	2700 ppm	3800 ppm	2800 ppm	3800 ppm
251-500	2900 ppm	3800 ppm	3000 ppm	3800 ppm
501-1000	3200 ppm	3800 ppm	3300 ppm	3800 ppm
1001-2256	3500 ppm	3800 ppm	3600 ppm	3800 ppm

In summary, the proposed changes for CLA and RWST boron concentrations have been developed with the same methodology as previously approved by NRC. This effort only applies this methodology to various core loading of TPBARs and allows operational flexibility with respect to the amount of boron that must be achieved and maintained to satisfy the safety function of the CLAs and RWST. Implementation of the proposed TS change will maintain the necessary boron concentration to mitigate the consequences of an accident and will continue to minimize the risk to the health and safety of the public.

5. REGULATORY SAFETY ANALYSIS

The proposed technical specification (TS) change will revise the limiting condition for operation (LCO) for TS Section 3.5.1, "Cold Leg Injection Accumulators" and TS Section 3.5.5, "Refueling Water Storage Tank." This revision will modify the single boron concentration requirement by inserting a table that defines the minimum and maximum amount of boron that is required for accident mitigation based on the number of tritium producing rods in the core. This proposed change will allow the flexibility to adjust boron levels as necessary based on the number of tritium producing rods in the core. A footnote is included in the proposed change that clarifies that the number of tritium producing rods in the core for a given cycle can be found in the Core Operating Limits Report. This footnote ensures that the specific number of rods can be identified for determining the amount of boron that is required.

5.1 No Significant Hazards Consideration

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change modifies the required boron concentration for the cold leg accumulators (CLAs) and refueling water storage tank (RWST). The proposed values have been verified to maintain the required accident mitigation safety function for the CLAs and RWST. The CLAs and RWST safety function is to mitigate accidents that require the injection of borated water to cool the core and to control reactivity. These functions are not potential sources for accident generation and the modification of the boron concentration that supports event mitigation will not increase the potential for an accident. Therefore, the possibility of an accident is not increased by the proposed changes. The boron levels for this change are based on the number or tritium producing rods in the core. As the number of rods is increased the need for additional shutdown boron also increases. This effect has been evaluated with the same methodology utilized for previous NRC approved amendments associated with tritium production. This methodology ensures that the impact of tritium producing rods is adequately compensated for by the required boron concentrations and has been incorporated into the proposed revision. Since the boron levels will continue to maintain the safety function of the CLAs and RWST in the same manner as currently approved, the consequences of an accident is not increased by the proposed changes.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change only modifies boron concentrations for accident mitigation functions of the CLAs and RWST. These functions do not have a potential to generate accidents as they only serve to perform mitigation functions associated with an accident. The proposed requirements will maintain the mitigation function in an identical manner as currently approved. There are no plant equipment or operational changes associated with the proposed revision other than the adjustment of the boron level in the CLAs and RWST. Therefore, since the CLA and RWST functions are not altered and the plant will continue to operate without change, the possibility of a new or different kind of an accident is not created.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   This change proposes boron concentration requirements that support the accident mitigation functions of the CLAs and RWST equivalent to the currently approved limits. The proposed change does not alter any plant equipment or components and does not alter any setpoints utilized for the actuation of accident mitigation system or control functions. The proposed boron values have been verified to provide the same level of reactivity control for accident mitigation. Therefore, the proposed change will not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment(s) present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include technical specifications (TSs) as part of the license. The Commission's regulatory requirements related to the content of the TS are contained in Title 10, Code of Federal Regulations (10 CFR), Section 50.36. The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation (LCO), (3) surveillance requirements, (4) design features, and (5) administrative controls. The boron concentration requirements for the cold leg accumulator (CLA) and refueling water storage tank (RWST) are included in the TS in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation."

As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TS is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that U.S. Nuclear Regulatory Commission (NRC) approve the TS changes before the TS changes are implemented. TVA's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

General Design Criteria 35, "Emergency core cooling," of 10 CFR 50, Appendix A, provides requirements for emergency core cooling systems. The expectation is that abundant core cooling is available to transfer heat from the core following a loss of reactor coolant. The purpose is to prevent core damage that could interfere with continued core cooling and to limit clad metal-water reaction to negligible amounts. The proposed change to allow boron concentration limits to vary based on number of tritium producing rods in the core, does not impact the ability of the emergency core cooling system to provide core cooling. Therefore, the proposed change will not affect compliance with the requirements of the design criteria.

10 CFR 50.46 "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors" and Appendix K of 10 CFR 50 "ECCS Evaluation Models" provide requirements for the design and analysis of emergency core cooling systems. These requirements focus on the need to provide water to the core to maintain acceptable fuel clad temperatures, minimize cladding oxidation, maintain coolable geometry of the core, and ensure long-term cooling of the core. These requirements address features for injection or recirculation of cooling water but do not specifically address the boron component or the potential for recriticality of the core. The proposed change continues to ensure sufficient boron concentrations to prevent a recriticality event during postulated accidents and will not adversely affect compliance with the requirements for emergency core cooling systems in 10 CFR 50.46 or Appendix K of 10 CFR 50.

The post-loss of coolant accident (LOCA) long-term core cooling analysis for SQN Units 1 and 2 requires maintaining a subcritical boron concentration following a LOCA after all boration sources are injected and mixed in the containment sump, without taking credit for any rod cluster control assembly (RCCA) insertion. These boration sources include the CLAs, the RWST, and the melted ice from the ice condenser containment.

The proposed use of tritium producing burnable absorber rods (TPBARs) at Sequoyah Nuclear Plant (SQN) introduces an additional neutron poison into the reactor core. When large amounts of excess neutron poison are added to a core, such as with TPBARs, there is competition for neutrons from all the poisons and the negative worth of each poison (including the reactor coolant system [RCS] boron) decreases. Following a LOCA, the positive reactivity insertion due to the negative moderator coefficient that occurs during the cooldown from hot full power to cold conditions must be entirely overcome by RCS boron. Because the RCS boron will be worth less with a TPBAR core, a higher concentration is needed to maintain subcriticality. The ice (at approximately 2000 parts per million [ppm]) is a dilution source which has to be overcome by the CLAs and the RWST concentrations in order to prevent criticality. NRC has approved an increase in the CLA boron concentration from the present range of 2400 to 2700 ppm to a range of 3500 to 3800 ppm, and the RWST boron concentration from the present range of 2500 to 2700 ppm to a range of 3600 to 3800 ppm. TVA is now proposing five new intermediate ranges of boron concentration that are matched to the number of TPBARs actually loaded. These new ranges reflect the minimum amount of boron required to counteract the effects of the TPBARs described above. To verify that these increased boron concentration ranges are adequate to maintain subcriticality following a LOCA, Framatome-ANP performed analyses using the NRC-approved core simulator, NEMO. This analysis conservatively assumed failures of TPBARs and various adverse reactivity conditions.

TVA evaluated the impacts of the proposed increase in CLA and RWST boron concentration ranges on the LOCA analyses. The large break LOCA (LBLOCA) and small break LOCA (SBLOCA) analyses do not explicitly model the boron concentration levels present in the CLAs or RWST. However, although not modeled in the analyses, any additional boron injected due to the increased concentration levels would increase the margin by which the core is maintained subcritical. The peak clad temperature and clad oxidation are not functions of the boron concentration. Therefore, the increased levels of CLA and RWST boron concentration will not adversely impact the results of the LBLOCA and SBLOCA.

With respect to post-LOCA long-term core cooling requirements, the proposed ranges for the CLAs and RWST will not change the maximum boron concentration of 3800 ppm and therefore, the boric acid will not precipitate in the long term following certain LOCAs. The model used to determine the acceptability of the maximum boron concentration is consistent with the traditional 1975 model used by licensee's operating Westinghouse-designed nuclear steam supply systems. Predicted times available for initiation of hot leg swap over (HLSO) included the following:

Case	Case Description	HLSO Time, hours
1	Traditional analysis with no allowance for boric acid saturation concentration uncertainty	7.25
2	Traditional analysis with allowance for boric acid saturation concentration uncertainty	5.59
3	Case 1 with Appendix K decay heat generation rate assumption	5.35
4	Case 2 with Appendix K decay heat generation rate assumption	4.15

Based on this information, SQN emergency operating procedures will be revised to require initiation of hot leg emergency core cooling system recirculation 3 hours following a LBLOCA for the tritium production core rather than 5.5 hours. The 3-hour switchover time requirement does not increase operator burden during LOCA mitigation and recovery and will provide an added measure of conservatism with respect to the tritium production core long-term cooling analysis.

TVA also evaluated the impacts of the increased CLA and RWST boron concentrations on non-LOCA transients. The CLAs do not inject for any of the SQN non-LOCA transients; therefore, the higher CLA boron concentration will have no impact on any of the Updated Final Safety Analysis Report (UFSAR) Chapter 15 non-LOCA transients. The following non-LOCA accidents model the RWST boron concentration:

- Steam Line Break (SLB) at Hot Zero Power
- Feedwater Line Break
- Spurious Operation of the Safety Injection System at Power
- Mass and Energy Releases
- Steam Generator Tube Rupture
- Containment Mass and Energy Releases

TVA has verified that the results of these accidents are not impacted by the increased boron concentrations in the RWST. The feedwater line break, steam generator tube rupture (SGTR) and containment mass and energy releases conservatively do not credit the CLA or RWST boron concentrations and are therefore not impacted. For the SLB at hot zero power (HZP), dryout of the broken steam generator and a subsequent reduction in RCS cooling ends the core power excursion prior to the introduction of boron into the RCS. The SLB mass and energy release evaluation relies on control rods for shutdown margin and assumes a minimum boron concentration. The spurious operation of the safety injection system at power analysis is postulated to maximize the insertion of negative reactivity and assumes a maximum boron concentration. The SQN UFSAR analysis of record assumes a boron concentration of 20,000 ppm, which conservatively bounds the proposed RWST boron concentration of 3800 ppm. TVA evaluated the issue of boron precipitation from solution at the proposed increased concentrations and concluded that this is not credible at the minimum RWST temperature of 60 degrees Fahrenheit (°F) and minimum CLA temperature of 70°F. The minimum acceptable temperature associated with the proposed RWST and CLA boron concentrations is near the freezing point (32°F).

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6. ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 50.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7. REFERENCES

1. Sequoyah Nuclear Plant, Final Safety Analysis Report (As Updated) Revision 17, Sections 6.2.2, 6.3, 9.1.3, 15.2.4, 15.2.13, 15.2.14, 15.3.1, 15.4.1, 15.4.2, and 15.4.3, dated November 8, 2002
2. Framatome-Advanced Nuclear Power Topical BAW-10237, "Implementation and Utilization of Tritium Producing Burnable Absorber Rods (TPBARS) in Sequoyah Units 1 and 2," dated September 2001

3. TVA's letter to NRC dated September 21, 2001, "Sequoyah Nuclear Plant (SQN) - Units 1 and 2 - Revision of Instrumentation Measurement Range, Boron Concentration Limits, Reactor Core Limitations, and Spent Fuel Pool Storage Requirements for Tritium Production Cores (TPCs) - Technical Specification (TS) Change No. 00-06"
4. NRC's letter to TVA dated September 30, 2002, "Sequoyah Nuclear Plant, Units 1 and 2 - Issuance of Amendments Regarding Technical Specification Change No. 00-06 (TAC Nos. MB2972 and MB2973)(TSC 00-06)"

ENCLOSURE 2

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

Proposed Technical Specification Changes (mark-up)

I. AFFECTED PAGE LIST

Unit 1

3/4 5-1
3/4 5-11

Unit 2

3/4 5-1
3/4 5-11

II. MARKED PAGES

See attached.

3/4 5 1 ACCUMULATORS

COLD LEG INJECTION ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1.1 Each cold leg injection accumulator shall be OPERABLE with·

a. The isolation valve open,

b A contained borated water volume of between 7615 and 7960 gallons of borated water,

c. ~~Between 3500 and 3800 ppm of boron,~~ ***A boron concentration in accordance with the requirements below,***

Number of TPBARs[#]	***Minimum Boron***	***Maximum Boron***
0	***2400 ppm***	***3800 ppm***
1-250	***2700 ppm***	***3800 ppm***
251-500	***2900 ppm***	***3800 ppm***
501-1000	***3200 ppm***	***3800 ppm***
1001-2256	***3500 ppm***	***3800 ppm***

d. A nitrogen cover-pressure of between 624 and 668 psig, and

e. Power removed from isolation valve when RCS pressure is above 2000 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION.

a With one cold leg injection accumulator inoperable, except as a result of boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to 1000 psig or less within the following 6 hours.

b With one cold leg injection accumulator inoperable due to the boron concentration not within limits, restore boron concentration to within limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to 1000 psig or less within the following 6 hours.

* Pressurizer pressure above 1000 psig.

[#] ***The number of TPBARs in the reactor core is contained in the COLR for each fuel cycle.***

3/4 5 5 REFUELING WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

3 5 5 The refueling water storage tank (RWST) shall be OPERABLE with:

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

b. ~~A boron concentration of between 3600 and 3800 ppm of boron,~~ ***A boron concentration in accordance with the requirements below,***

Number of TPBARs#	***Minimum Boron***	***Maximum Boron***
0	***2500 ppm***	***3800 ppm***
1-250	***2800 ppm***	***3800 ppm***
251-500	***3000 ppm***	***3800 ppm***
501-1000	***3300 ppm***	***3800 ppm***
1001-2256	***3600 ppm***	***3800 ppm***

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

d. A maximum solution temperature of 105°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the RWST inoperable, restore the tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours

SURVEILLANCE REQUIREMENTS

4 5.5 The RWST shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the contained borated water volume in the tank, and

2. Verifying the boron concentration of the water.

b. At least once per 24 hours by verifying the RWST temperature.

 # The number of TPBARs in the reactor core is contained in the COLR for each fuel cycle.

3/4 5.1 ACCUMULATORS

COLD LEG INJECTION ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1.1 Each cold leg injection accumulator shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 7615 and 7960 gallons of borated water,

c. ~~Between 3500 and 3800 ppm of boron,~~ ***A boron concentration in accordance with the requirements below,***

Number of TPBARs[#]	***Minimum Boron***	***Maximum Boron***
0	***2400 ppm***	***3800 ppm***
1-250	***2700 ppm***	***3800 ppm***
251-500	***2900 ppm***	***3800 ppm***
501-1000	***3200 ppm***	***3800 ppm***
1001-2256	***3500 ppm***	***3800 ppm***

d. A nitrogen cover-pressure of between 624 and 668 psig, and

e. Power removed from isolation valve when RCS pressure is above 2000 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

a. With one cold leg injection accumulator inoperable, except as a result of boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to 1000 psig or less within the following 6 hours.

b. With one cold leg injection accumulator inoperable due to the boron concentration not within limits, restore boron concentration to within limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to 1000 psig or less within the following 6 hours

* Pressurizer pressure above 1000 psig.

 # The number of TPBARs in the reactor core is contained in the COLR for each fuel cycle.

3/4 5 5 REFUELING WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.5 5 The refueling water storage tank (RWST) shall be OPERABLE with:

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

b. ~~A boron concentration of between 3600 and 3800 ppm of boron,~~ ***A boron concentration in accordance with the requirements below,***

Number of TPBARs#	***Minimum Boron***	***Maximum Boron***
0	***2500 ppm***	***3800 ppm***
1-250	***2800 ppm***	***3800 ppm***
251-500	***3000 ppm***	***3800 ppm***
501-1000	***3300 ppm***	***3800 ppm***
1001-2256	***3600 ppm***	***3800 ppm***

c A minimum solution temperature of 60°F, and

d A maximum solution temperature of 105°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION·

With the RWST inoperable, restore the tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.5.5 The RWST shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the contained borated water volume in the tank, and

2. Verifying the boron concentration of the water.

b. At least once per 24 hours by verifying the RWST temperature.

 # The number of TPBARs in the reactor core is contained in the COLR for each fuel cycle.