VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

June 22, 2000

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

Serial No.	00-305
NL&OS/GSS/ETS	R0
Docket Nos.	50-338
	50-339
License Nos.	NPF-4
	NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATION CHANGES
INCREASED BORON CONCENTRATION

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company requests amendments, in the form of changes to the Technical Specifications to Facility Operating Licenses Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes will increase the boron concentration limits in the refueling water storage tank, casing cooling tank, safety injection accumulators and the spent fuel pool. A discussion of the proposed Technical Specifications changes is provided in Attachment 1. The mark-up and typed pages are provided in Attachments 2 and 3, respectively.

We have evaluated the significant hazards considerations and have determined that the proposed Technical Specifications changes do not constitute a significant hazards consideration as defined in 10 CFR 50.92. The basis for our determination that the changes do not involve a significant hazards consideration is provided in Attachment 4. We have also determined that operation with the proposed changes will not result in any significant increases in the amounts of effluents that may be released offsite and in any significant increases in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the approval of the proposed changes.

Because of the nature of the proposed Technical Specification changes, and to eliminate interim controls if implemented during power operations, we plan to implement the changes during the North Anna Units 1 and 2 Cycle 15/16 refueling outages. These outages are currently scheduled to begin in the fall of 2001 and 2002, respectively. To permit effective outage planning, it is requested that the NRC approve the proposed

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Technical Specification changes by April 2001 and permit the effective date of the amendment to be the end of the Cycle 15/16 refueling outage for each unit.

If you have any further questions or require additional information, please contact us.

Very truly yours,

David A. Christian
Senior Vice President and
Chief Nuclear Officer

Attachments:

Attachment 1	Discussion of Changes
Attachment 2	Mark-up of Technical Specifications Changes
Attachment 3	Proposed Technical Specifications Changes
Attachment 4	Significant Hazards Consideration Determination

Commitments made in this letter:

1. None

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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by David A. Christian who is Senior Vice President and Chief Nuclear Officer of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 22nd day of June, 2000.

My Commission Expires: 3/31/04.

Maggie McClure
Notary Public

(SEAL)

Attachment 1

Discussion of Changes

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company

1.0 Introduction

Virginia Electric and Power Company (Virginia Power) outage planning philosophy has been to stagger outages whenever possible in order to avoid load management, logistical and economic disadvantages associated with concurrent outages. In order to accommodate this outage planning philosophy, the fuel management plan for each unit provides for flexibility in the final end-of-cycle burnup including the use of power and average temperature coastdowns. By reducing end of cycle temperature coastdowns we can maximize electrical generation and increase operational flexibility. In order to reduce temperature coastdowns an increased initial core reactivity is necessary which requires higher boron concentrations than permitted by Technical Specifications to meet increased shutdown requirements. Therefore, pursuant to 50.90, Virginia Power is proposing changes to the Technical Specifications to increase the boron concentration requirements.

While end-of-cycle coastdowns are fully evaluated from a safety analysis perspective, they represent an off-nominal operational mode that is undesirable from the standpoint of maximizing electrical generation. Designing reload cores with increased initial core reactivity is one means of reducing the need for extended end-of-cycle coastdowns. However, increased core reactivity will require higher boron concentrations than previous cycles to meet increased shutdown requirements. One of the limiting parameters for core designers is the post-loss of coolant accident (LOCA) sump boron concentration limit. Increasing the boron concentration in borated water volumes that are introduced to containment following a large break (LB) LOCA will remove one obstacle currently preventing longer full power cycles.

Evaluations involving increased boron concentrations in the refueling water storage tank (RWST), casing cooling tank (CCT), and the spent fuel pool (SFP) from the current limits of 2300 to 2400 ppm to 2600 to 2800 ppm and from 2200 to 2400 ppm up to 2500 to 2800 ppm for the safety injection accumulators (SIA) have been completed. The acceptance criteria of all non-LOCA transients continue to be met. LOCA considerations, including the recirculation switchover time, the post-LOCA sump boron concentration limit, and the quench spray (QS) and post-LOCA sump pH limits have been evaluated. Boron solubility, equipment qualification, and RWST volume requirements have been addressed. Based on the evaluations discussed, the proposed increase in the boron concentration for the RWST, CCT, SIAs, and SFP will not adversely affect the safe operation of the plant.

2.0 Proposed Changes to the North Anna Units 1 and 2 Technical Specifications

The current Technical Specification boron concentration limits in the refueling water storage tank (RWST), casing cooling tank (CCT), and safety injection accumulators (SIAs) are as follows:

RWST:	2300 – 2400 ppm
CCT:	2300 – 2400 ppm
SIAs:	2200 – 2400 ppm

Virginia Power proposes to increase the Technical Specification boron concentration limits to the following ranges:

RWST:	2600 – 2800 ppm
CCT:	2600 – 2800 ppm
SIAs:	2500 – 2800 ppm

The proposed revised boron concentration limits may be implemented by modification of the following North Anna Units 1 and 2 Technical Specification Limiting Conditions for Operation and associated Bases:

Technical Specification 3.1.2.7	Reactivity Control Systems Borated Water Sources – Shutdown
Technical Specification 3.1.2.8	Reactivity Control Systems Borated Water Sources – Operation
Technical Specification 3.5.1	Emergency Core Cooling System (ECCS) Accumulators
Technical Specification 3.5.5	Emergency Core Cooling Systems Refueling Water Storage Tank
Technical Specification 3.6.2.2	Containment Systems Containment Recirculation Spray System
Technical Specification 3.9.1	Refueling Operations Boron Concentration

These changes are discussed in greater detail below.

- Change to Technical Specifications 3.1.2.7, 3.1.2.8, and 3.5.5

The RWST boron concentration limits are changed from 2300 to 2400 ppm to 2600 to 2800 ppm in T.S. 3.1.2.7, 3.1.2.8, and 3.5.5. Increasing the boron concentration limits provides additional negative reactivity to compensate for increased reactivity associated with future core designs. Increasing the difference between the upper and lower surveillance limits from 100 ppm to 200 ppm provides additional operational flexibility.

- Change to Technical Specification 3.5.1

In order for the RWST and the SIAs to be at the same concentration, the boron concentration requirements for the SIAs must be revised. The SIA boron concentration limits are changed from 2200 to 2400 ppm to 2500 to 2800 ppm in T.S. 3.5.1. Increasing the difference between the upper and lower surveillance limits from 200 ppm to 300 ppm provides additional operational flexibility.

- Change to Technical Specification 3.6.2.2

In order for the RWST and the CCT to be at the same concentration, the boron concentration requirements for the CCT must be revised. The CCT boron concentration limits are changed from 2300 to 2400 ppm to 2600 to 2800 ppm in T.S. 3.6.2.2.

- Change to Technical Specification 3.9.1

T.S. 3.9.1 requires that, with the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal must be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met: (a) a K_{eff} of 0.95 or less, or (b) a boron concentration of ≥2300 ppm. It is proposed that the boron concentration requirement of TS 3.9.1 be increased from ≥2300 ppm to ≥2600 ppm.

In addition, Virginia Power plans to increase the boron concentration of the spent fuel pool to a concentration of ≥2600 ppm in order to maintain consistent with the TS 3/4.9.1 Bases that state that "during REFUELING a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel."

3.0 Safety Significance

3.1 Introduction

Virginia Power has evaluated the impact of the proposed Technical Specification changes on the following:

- Non-LOCA UFSAR Chapter 15 transients (e.g., Boron Dilution, Main Steamline Break, Startup of an Inactive Loop)
- LOCA evaluations, including
  - the post-LOCA recirculation mode switchover time interval (specified in Emergency Operating Procedures to prevent boron precipitation in core flow channels),
  - the post-LOCA sump boron concentration limit (evaluated for each reload core design to ensure long-term post-LOCA subcriticality), and

- the post-LOCA quench spray (QS) and containment sump pH (to ensure adequate atmospheric iodine removal and retention capability, and to minimize the potential for stress corrosion cracking of stainless steel components in containment).

- Other miscellaneous safety considerations, including
  - margin to the temperature-dependent boric acid solution solubility limit,
  - environmental qualification of equipment installed in containment, and
  - RWST and boric acid storage tank sizing calculations.

These evaluations concluded that with one exception the proposed increased boron concentration limits for the RWST, CCT, and SIAs provide an analytical benefit from a reactivity management and accident mitigation standpoint. Discussions of the evaluations performed in support of the proposed changes are presented below.

3.2 Non-LOCA Transients

Of the non-LOCA transients, only the Boron Dilution accident analysis was found to be potentially adversely affected by the proposed increased boron concentrations. The other non-LOCA transients were either not impacted or were made less severe as a result of the increased boron concentrations. For example, an increased boron concentration in the RWST and, hence, in the safety injection system, would make the Main Steamline Break analysis results less limiting. The Startup of an Inactive Loop accident analysis is insensitive to the refueling boron concentration, since this accident is precluded by Technical Specification requirements governing loop stop valve operations.

The Boron Dilution event at Refueling, Cold Shutdown, Hot Shutdown, and Hot Standby conditions is precluded by administrative lock-out of the primary grade water flow path in accordance with North Anna Units 1 and 2 Technical Specification 3.1.1.3.2. However, the Boron Dilution at Startup and Power Operation analyses are potentially impacted by the proposed increased RWST boron concentration. The impact on the Startup and Power Operation scenarios is indirect, and is a result of the increased allowable critical RCS boron concentrations resulting from the increased RWST boron concentration. RCS critical boron concentrations are explicitly considered in reload evaluations of the Boron Dilution at Startup and At Power accident scenarios. As required by the current analyses of record, the reload evaluations of the Boron Dilution at Startup and at Power ensure that at least 15 minutes are available for corrective operator action between positive indication of a dilution in progress and complete loss of shutdown margin.

As indicated above, the proposed increased boron concentrations can support increased critical boron concentrations. This, in turn, can result in higher reactivity insertion rates achieved during the boron dilution event. The effects of increased reactivity insertion rates resulting from the proposed increased boron concentrations were also considered in the context of Departure from Nucleate Boiling (DNB), and

were determined to be easily bounded by the reactivity insertion rates assumed in the Rod Withdrawal at Power analysis. Therefore, the DNB acceptance criterion for the boron dilution event continues to be met.

3.3 LOCA Evaluations

The effects of the proposed increased boron concentrations on Small (SB) and Large Break (LB) LOCA analyses were also considered. The LBLOCA is characterized by a rapid depressurization that causes the generation of significant voiding in the reactor coolant system (RCS). In accordance with 10CFR50 Appendix K, the docketed North Anna LBLOCA analysis does not assume control rod insertion. As a result, heat generation in the core is reduced to decay heat levels by void reactivity. Therefore during the blowdown phase of the LBLOCA the core is shutdown and remains shutdown due to void reactivity.

The refill/reflood portion of the injection phase begins with the highly voided core and continues from downcomer refill through core reflood. During this time, void reactivity is of primary importance at the start and gradually begins to be replaced by boron as the primary source of negative reactivity. The docketed North Anna LBLOCA analysis shows that the peak cladding temperature (PCT) is reached prior to the time the boron becomes significant in maintaining core shutdown. In fact, boron concentrations are not modeled in peak cladding temperature cases. Therefore, the proposed increased RWST and SIA boron concentrations have no effect on the calculated PCT results for the LBLOCA and would, in fact, provide a benefit if accounted for in the analysis. Thus, the proposed increased RWST and SIA boron concentrations provide additional unmodeled conservatism.

The SBLOCA analysis falls into the category of those transients that cause safety injection actuation. The SB LOCA model assumes the insertion of control rods in the calculation of core shutdown. Consequently, the boron concentration required to achieve the level of negative reactivity necessary to assure shutdown for the SBLOCA is significantly lower than the concentration required to assure shutdown for a LBLOCA. The increase in RWST boron concentration provides additional conservatism for the SBLOCA.

3.3.1 Post-LOCA Cold-to-Hot Leg Recirculation Switchover Time

Following a LBLOCA, borated water from the RWST and accumulators enters the core region through the cold leg during the injection phase of the transient. Assuming a cold leg break, borated coolant enters the core region from the intact cold leg, down the downcomer, and into the core. Steam exits through the hot leg, and excess safety injection water spills out the break. Although the water vapor exits the core and condenses in the containment, only a small fraction of the dissolved boron is carried off in the steam. Therefore, the concentration of boron increases over time in the reactor vessel. If the boron concentration reaches the solubility limit, boron will begin to

precipitate, forming a paste that can block the coolant flow channels in the core. Such a condition may lead to inadequate cooling of the fuel.

If the break is in the hot leg or in the pressurizer, safety injection water will flow down the downcomer, up through the core, and out the break, thereby continuously replacing the boric acid solution in the core region. In such a situation, switchover to hot leg recirculation is not necessary. However, there is no unambiguous way to locate the pipe break from the control room, so switchover from cold leg to hot leg injection is required at a specific time for all LOCAs.

Because of the proposed boron concentration increases, the recirculation switchover from cold to hot leg injection must occur sooner to avoid boron precipitation in the reactor vessel. A revised cold-to-hot leg switchover time will be implemented in North Anna Emergency Operating Procedures upon approval of the proposed increased Technical Specification boron concentrations.

A Westinghouse Nuclear Safety Advisory Letter identified a safety concern regarding the possibility of inadvertent re-criticality following switchover from cold leg to hot leg safety injection. The accumulation of boron in the reactor vessel following a LBLOCA, and prior to cold-to-hot leg switchover, results in a decrease in the sump boron concentration. Westinghouse postulated that switchover from cold leg to hot leg injection may wash out the concentrated boric acid in the core region, and replace it with the sump fluid which is depleted in boric acid. If the reduction in sump boron concentration during cold leg injection is sufficient, the cold-to-hot leg switchover may result in inadvertent re-criticality. A reload safety analysis checklist parameter verifies the adequacy of the sump boron concentration to maintain subcriticality at the time of cold-to-hot leg recirculation switchover.

3.3.2 Post-LOCA Sump Boron Concentration Limit

Following a SBLOCA or LBLOCA, fluid from various volumes accumulates in the containment sump. At North Anna, these volumes include the RWST, CAT, SIAs, the safety injection system piping, the reactor coolant system (RCS), the boron injection tank (BIT), and CCT. All of these volumes contain boric acid solution with the exception of the CAT, which contains sodium hydroxide solution. Depending on the magnitude of the loss of coolant accident (LOCA), some or all of the liquid contained in these volumes will be introduced to containment, and will ultimately accumulate in the containment sump. It is assumed in the sump boron analysis for the design basis LBLOCA, that all of the liquid in these volumes is transferred to containment.

It is necessary to have a sufficiently high boric acid concentration in the sump mixture to ensure that the reactor remains subcritical. As more reactivity is loaded into the core, increased amounts of boron are required. The post-LOCA sump boron concentration limit for an increased boron concentration of 2600 to 2800 ppm in the RWST and CCT, and an increased boron concentration of 2500 to 2800 ppm in the SIAs was recalculated using the methodology of the current analysis of record. The proposed

increased boron concentrations increase the shutdown margin following a LOCA. Reload safety evaluations performed in accordance with the Reference 1 methodology will incorporate the revised sump boron concentration limit.

3.3.3 Post-LOCA Containment Sump and Quench Spray (QS) pH Analysis

Limits are placed on the containment sump and QS pH to ensure adequate post-LOCA radioiodine removal and retention, and to minimize the potential for stress corrosion cracking of stainless steel components in containment. A post-LOCA sump pH range of 7.0 to 9.5 is specified in the Standard Review Plan (SRP) (Reference 2) to avoid the onset of stress corrosion cracking and to ensure adequate iodine retention in the post-LOCA sump. A pH range from 8.5 to 10.5 is specified for QS in the SRP to minimize the evolution of iodine during post-LOCA operation of the containment spray system.

The pH of the post-LOCA sump is determined by a volume-weighted average of the boric acid and sodium hydroxide concentrations from each analyzed volume. Density changes between tank and post-LOCA sump conditions are also modeled in the analysis. Because the data table used to interpolate the pH assumes that boric acid and sodium hydroxide concentrations are expressed as molarities (moles solute per liter), each volume's concentration (weight percent) is converted to a molarity prior to mixing the contents of the individual volumes in the sump.

The pH of the QS is calculated on the basis of the molarity and volumetric flow rate of liquid drawn from the RWST and CAT into the QS pump suction. The CAT and RWST draw down in hydrostatic equilibrium. The specific gravity of the boric acid and sodium hydroxide solutions, and the effects of safety injection flow and QS flow rate from these two volumes are explicitly modeled.

After consideration of the proposed revised boron concentrations in the RWST, CCT, and SIAs, the QS and post-LOCA sump pH analysis limits continue to be met. Specifically, the post-LOCA containment sump pH is calculated to be between 7.0 and 9.5, and the QS pH is calculated to be between 8.5 and 10.5 with at least 95% probability and confidence.

3.4 Other Evaluations

3.4.1 Boron Solubility

The highest proposed allowable boron concentration in the RWST, CCT, SIAs, or SFP is 2800 ppm. This boron concentration does not approach the solubility limit at the lowest operating temperatures of the RWST, CCT, SIAs, or SFP. The temperature of the RWST fluid is limited to between 40 °F and 50 °F in Technical Specification 3.5.5. A boron concentration of about 2.5 weight percent boron (~4370 ppm) remains soluble at temperatures above 32 °F.

3.4.2 Equipment Qualification

Chemical spray is one of the environmental factors used to qualify the class 1E electrical equipment to assure operation when required. For the North Anna units, this environmental factor is considered for equipment inside containment experiencing a LOCA environment. There are two sources of chemical spray: quench spray and recirculation spray. The quench spray takes borated water from the RWST and NaOH solution from the CAT. The recirculation spray system takes suction from the containment sump.

Increasing the boron concentration to 2600 to 2800 ppm in the RWST and CCT and to 2500 to 2800 ppm in the SIAs will not adversely affect the environmental qualification of equipment in the Equipment Qualification Master List (EQML). The corrosive agent in chemical spray is primarily NaOH. Increasing the boron concentration lowers the solution pH making it less corrosive (more neutral). Therefore, higher boron concentration limits are acceptable, even for those components qualified at a lower boron concentration.

3.4.3 RWST and Boric Acid Storage Tank (BAST) Volume Requirements

Technical Specification Bases 3/4.1.2 requires the boration capability of the RWST and the boric acid storage tank (BAST) to be sufficient to provide a 1.77%$\Delta k/k$ shutdown margin from end-of-cycle (EOC) hot full power conditions after xenon decay and cooldown to 200°F. Furthermore, the same shutdown margin must be maintained after cooldown from 200°F to 140°F.

The RWST and BAST volumes necessary to satisfy these requirements are calculated by determining the reactivity required to cool the unit down to either 200°F from hot full power (HFP) or to 140°F from 200°F. The required reactivity is determined in a conservative fashion by adding the temperature reactivity defects, xenon reactivity, and required shutdown margin. A simple mixing model is used to determine the RWST or BAST volume needed to achieve the required boron concentration in the reactor coolant system. The proposed increased RWST boron concentration is a benefit to the analysis which demonstrates the adequacy of the RWST to meet the design requirement established in Technical Specification Bases 3/4.1.2. The adequacy of the BAST to meet the Technical Specification Bases 3/4.1.2 design requirement will be evaluated for each reload core as part of the reload design and safety analysis process.

4.0 Conclusions

Changes to the Technical Specification Limiting Conditions for Operation and associated bases are required to implement boron concentration increases in the RWST, CCT, SIAs, and SFP. Evaluations involving increased boron concentrations in the RWST, CCT, and the SFP from the current Technical Specification limits of 2300 to

2400 ppm to 2600 to 2800 ppm and from 2200 to 2400 up to 2500 to 2800 for the SIAs have been completed.

- The acceptance criteria of all non-LOCA transients continue to be met.
- LOCA considerations, including the recirculation switchover time, the post-LOCA sump boron concentration limit, and the quench spray and post-LOCA sump pH have been evaluated and found to be acceptable.
- Other considerations, such as boron precipitation, equipment qualification, and the adequacy of RWST and BAST volumes to meet design requirements, were also evaluated. It has been determined that boron precipitation will not occur for the proposed revised boron concentration limits. Further, the electrical equipment subject to chemical spray qualification will not be adversely affected by the proposed increased boron concentrations. Finally, the RWST and BAST volumes were evaluated and determined to be adequate to meet the design requirements established in Technical Specification Bases 3/4.1.2.

Based on these evaluations, the proposed increased boron concentrations for the RWST, CCT, SIAs, and SFP have been determined to not adversely affect the safe operation of the plant.

6.0 References

1. "Reload Nuclear Design Methodology," VEP-FRD-42, Revision 1-A, September 1986 and supplemented by Letter from M. L. Bowling to NRC, Serial No. 93-723, December 3, 1993.

2. NUREG-0800, Revision 2, "USNRC Standard Review Plan," July 1, 1981.

3. North Anna UFSAR Chapter 15, Accident Analysis, Revision 35

4. North Anna UFSAR Chapter 6, Engineered Safety Features

5. Westinghouse Nuclear safety Advisory Letter, 90-016, "Core Re-Criticality During Hot Leg Recirculation"

Attachment 2

Mark-up of Unit 1 and Unit 2 Technical Specifications Changes

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

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

1. A minimum contained borated water volume of 1378 gallons,
2. Between 12,950 and 15,750 ppm of boron, and
3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 51,000 gallons,
2. Between ~~2300 and 2400~~ 2600 and 2800 ppm of boron, and
3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

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

SURVEILLANCE REQUIREMENTS

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

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,
2. Verifying the contained borated water volume of the tank, and
3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water and the outside air temperature is < 35°F.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

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

1. A contained borated water volume of between 6000 and 16,280 gallons,
2. Between 12,950 and 15,750 ppm of boron, and
3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A contained borated water volume of between 466,200 and 487,000 gallons,
2. Between ~~2300 and 2400~~ 2600 and 2800 ppm of boron, and
3. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, 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 1.77% Δk/k at 200°F;
restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

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

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system accumulator shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 7580 and 7756 gallons

c. Between ~~2200 and 2400~~ 2500 and 2800 ppm of boron, and

d. A nitrogen cover-pressure of between 599 and 667 psig.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in HOT SHUTDOWN within the next 12 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and

2. Verifying that each accumulator isolation valve is open.

*Pressurizer Pressure above 1000 psig. Power lock out of valves is not permitted in MODE 3 when below 1000 psig.

EMERGENCY CORE COOLING SYSTEMS

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 465,200 and 487,000 gallons.

b. Between ~~2300 and 2400~~ 2600 and 2800 ppm of boron, and

c. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the refueling water storage tank 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.

CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of:

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

b. One casing cooling tank (shared with both trains) shall be OPERABLE with:

1. Contained borated water volume of at least 116,500 gallons.

2. Between ~~2300 and 2400~~ 2600 and 2800 ppm boron concentration.

3. A solution temperature ≥ 35°F and ≤ 50° F.

APPLICABILITY: Modes 1, 2, 3 and 4

ACTION:

a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of $\geq$ ~~2300~~ 2600 ppm

APPLICABILITY: MODE 6*.

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at $\geq$ 10 gpm of $\geq$ 12,950 ppm boric acid solution or its equivalent until K_{eff} is reduced to $\leq$ 0.95 or the boron concentration is restored to $\geq$ 2300 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length control rod located within the reactor pressure vessel, in excess of 3 feet from its fully inserted position.

4.9.1.2 The boron concentration of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

* The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

3/4.1.2 BORATION SYSTEMS (Continued)

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

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.77% Δk/k after xenon decay and cooldown to 200°F. This expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6,000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of ~~2300~~ 2600 ppm borated water from the refueling water storage tank.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 235°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

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

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% Δk/k after ~~zenon~~ Xenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of ~~2300~~ 2600 ppm borated water from the refueling water storage tank.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The OPERABILITY of one boron injection system during REFUELING insures that this system is available for reactivity control while in MODE 6.

3/4.9 REFUELING OPERATIONS

BASES

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a 1% $\Delta k/k$ conservative allowance for uncertainties. Similarly, the boron concentration of ~~2300~~ 2600 ppm or greater includes a conservative uncertainty allowance of 50 ppm boron.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive materials release from a fuel element rupture based upon a lack of containment pressurization potential while in the REFUELING MODE.

OPERABILITY of the containment airlock door requires that the door is capable of being closed, that the door is unblocked and no cables or hoses are being run through the airlock, and that a designated individual is continuously available to close the airlock door. This individual must be stationed near the airlock.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

a. A boric acid storage system and at least one associated heat tracing system with:

1. A minimum contained borated water volume of 1378 gallons,

2. Between 12,950 and 15,750 ppm of boron, and

3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 51,000 gallons,

2. Between ~~2300 and 2400~~, ppm of boron, and

3. A minimum solution temperature of 35°F.

2600 and 2800

APPLICABILITY: MODES 5 and 6.

ACTION:

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

SURVEILLANCE REQUIREMENTS

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

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,

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

3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water and the outside air temperature is less than 35°F.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.8 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 and at least one associated heat tracing system with:

   1. A contained borated water volume of between 6000 and 16,280 gallons,

   2. Between 12,950 and 15,750 ppm of boron, and

   3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

   1. A contained borated water volume of between 466,200 and 487,000 gallons,

   2. Between ~~2300 and 2400~~ 2600 and 2800 ppm of boron, and

   3. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

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 1.77% Δk/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

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.

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system accumulator shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 7580 and 7756 gallons

c. Between ~~2200 and 2400~~ ppm of boron, and

d. A nitrogen cover-pressure of between 599 and 667 psig.

APPLICABILITY: MODES 1, 2 and 3*.

2500 and 2800

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in HOT SHUTDOWN within the next 12 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and

2. Verifying that each accumulator isolation valve is open.

*Pressurizer Pressure above 1000 psig. Power lock out of valves is not permitted in MODE 3 when below 1000 psig.

EMERGENCY CORE COOLING SYSTEMS

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 466,200 and 487,000 gallons.

b. Between ~~2300 and 2400~~ 2600 and 2800 ppm of boron, and

c. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the refueling water storage tank 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.

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of:

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

b. One casing cooling tank (shared with both trains) shall be OPERABLE with:

1. Contained borated water volume of at least 116,500 gallons.
2. Between ~~2300 and 2400~~ 2600 and 2800 ppm boron concentration.
3. A solution temperature ≥ 35°F and ≤ 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2.1 Each containment recirculation spray subsystem and casing cooling subsystem shall be demonstrated OPERABLE:

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

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of $\geq$ ~~2300~~ 2600 ppm

APPLICABILITY: Mode 6*

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at $\geq$ 10 gpm of $\geq$ 12,950 ppm boric acid solution or its equivalent until K_{eff} is reduced to $\leq$ 0.95 or the boron concentration is restored to $\geq$ 2300 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length control rod located within the reactor pressure vessel, in excess of 3 feet from its fully inserted position.

4.9.1.2 The boron concentration of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

* The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

3/4.1.2 BORATION SYSTEMS

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

With the RCS average temperature above 200°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 operation conditions of 1.77% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of ~~2300~~ 2600 ppm borated water from the refueling water storage tank.

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

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 270°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% delta k/k after ~~xenon~~ Xenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of ~~2300~~ 2600 ppm borated water from the refueling water storage tank.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a 1% $\Delta k/k$ conservative allowance for uncertainties. Similarly, the boron concentration of ~~2300~~ 2600 ppm or greater includes a conservative uncertainty allowance of 50 ppm boron.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive materials release from a fuel element rupture based upon a lack of containment pressurization potential while in the REFUELING MODE.

OPERABILITY of the containment airlock door requires that the door is capable of being closed, that the door is unblocked and no cables or hoses are being run through the airlock, and that a designated individual is continuously available to close the airlock door. This individual must be stationed near the airlock.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

Attachment 3

Proposed Unit 1 and Unit 2 Technical Specifications Changes

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company

TECH SPEC CHANGE REQUEST NO. 375

TABULATION OF CHANGES

License No. NPF-4 / Docket No. 50-338

Summary of change:

This proposed change to the Technical Specifications is being made to increase the boron concentration requirements.

DELETE	DATED	SUBSTITUTE
3/4 1-15	04-14-87	3/4 1-15
3/4 1-16	06-04-91	3/4 1-16
3/4 5-1	04-14-87	3/4 5-1
3/4 5-9	12-14-88	3/4 5-9
3/4 6-12	09-02-93	3/4 6-12
3/4 9-1	04-14-87	3/4 9-1
B 3/4 1-3	07-24-96	B 3/4 1-3
B 3/4 9-1	02-27-96	B 3/4 9-1

LIMITING CONDITION FOR OPERATION

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

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

1. A minimum contained borated water volume of 1378 gallons,
2. Between 12,950 and 15,750 ppm of boron, and
3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 51,000 gallons,
2. Between 2600 and 2800 ppm of boron, and
3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

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

SURVEILLANCE REQUIREMENTS

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

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,
2. Verifying the contained borated water volume of the tank, and
3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water and the outside air temperature is < 35°F.

LIMITING CONDITION FOR OPERATION

3.1.2.8 Each of the following borated water sources shall be OPERABLE:

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

1. A contained borated water volume of between 6000 and 16,280 gallons,
2. Between 12,950 and 15,750 ppm of boron, and
3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A contained borated water volume of between 466,200 and 487,000 gallons,
2. Between 2600 and 2800 ppm of boron, and
3. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid storage system inoperable, 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 1.77% $\Delta k/k$ at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

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

4.1.2.8 Each borated water source shall be demonstrated OPERABLE:

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system accumulator shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 7580 and 7756 gallons,

c. Between 2500 and 2800 ppm of boron, and

d. A nitrogen cover-pressure of between 599 and 667 psig.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in HOT SHUTDOWN within the next 12 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and

2. Verifying that each accumulator isolation valve is open.

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* Pressurizer Pressure above 1000 psig. Power lock out of valves is not permitted in MODE 3 when below 1000 psig.

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 466,200 and 487,000 gallons,

b. Between 2600 and 2800 ppm of boron, and

c. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the refueling water storage tank 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.

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of:

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

b. One casing cooling tank (shared with both trains) shall be OPERABLE with:

1. Contained borated water volume of at least 116,500 gallons.

2. Between 2600 and 2800 ppm boron concentration.

3. A solution temperature ≥ 35°F and ≤ 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of ≥ 2600 ppm.

APPLICABILITY: Mode 6*.

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at ≥ 10 gpm of ≥ 12,950 ppm boric acid solution or its equivalent until K_{eff} is reduced to ≤ 0.95 or the boron concentration is restored to ≥ 2600 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length control rod located within the reactor pressure vessel, in excess of 3 feet from its fully inserted position.

4.9.1.2 The boron concentration of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

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* The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

3/4.1.2 BORATION SYSTEMS (Continued)

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

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.77% Δk/k after xenon decay and cooldown to 200°F. This expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6,000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of 2600 ppm borated water from the refueling water storage tank.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 235°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

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

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% Δk/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of 2600 ppm borated water from the refueling water storage tank.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The OPERABILITY of one boron injection system during REFUELING insures that this system is available for reactivity control while in MODE 6.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATION, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a 1% $\Delta k/k$ conservative allowance for uncertainties. Similarly, the boron concentration of 2600 ppm or greater includes a conservative uncertainty allowance of 50 ppm boron.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive materials release from a fuel element rupture based upon a lack of containment pressurization potential while in the REFUELING MODE.

OPERABILITY of the containment airlock door requires that the door is capable of being closed, that the door is unblocked and no cables or hoses are being run through the airlock, and that a designated individual is continuously available to close the airlock door. This individual must be stationed near the airlock.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

TECH SPEC CHANGE REQUEST NO. 375

TABULATION OF CHANGES

License No. NPF-7 / Docket No. 50-339

Summary of change:

This proposed change to the Technical Specifications is being made to increase the boron concentration requirements.

DELETE	DATED	SUBSTITUTE
3/4 1-13	04-14-87	3/4 1-13
3/4 1-14	06-04-91	3/4 1-14
3/4 5-1	04-14-87	3/4 5-1
3/4 5-10	12-14-88	3/4 5-10
3/4 6-11	09-02-93	3/4 6-11
3/4 9-1	04-14-87	3/4 9-1
B 3/4 1-3	08-26-98	B 3/4 1-3
B 3/4 9-1	02-27-96	B 3/4 9-1

LIMITING CONDITION FOR OPERATION

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

a. A boric acid storage system and at least one associated heat tracing system with:

1. A minimum contained borated water volume of 1378 gallons,
2. Between 12,950 and 15,750 ppm of boron, and
3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

1. A minimum contained borated water volume of 51,000 gallons,
2. Between 2600 and 2800 ppm of boron, and
3. A minimum solution temperature 35°F.

APPLICABILITY: MODES 5 and 6.

ACTION:

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

SURVEILLANCE REQUIREMENTS

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

a. At least once per 7 days by:

1. Verifying the boron concentration of the water,
2. Verifying the contained borated water volume of the tank, and
3. Verifying the boric acid storage tank solution temperature when it is the source of borated water.

b. At least once per 24 hours by verifying the RWST temperature when it is the source of borated water and the outside air temperature is less than 35°F.

LIMITING CONDITION FOR OPERATION

3.1.2.8 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 and at least one associated heat tracing system with:

   1. A contained borated water volume of between 6000 and 16,280 gallons,

   2. Between 12,950 and 15,750 ppm of boron, and

   3. A minimum solution temperature of 115°F.

b. The refueling water storage tank with:

   1. A contained borated water volume of between 466,200 and 487,000 gallons,

   2. Between 2600 and 2800 ppm of boron, and

   3. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

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 1.77% Δ k/k at 200°F; restore the boric acid storage system to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

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.

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system accumulator shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 7580 and 7756 gallons,

c. Between 2500 and 2800 ppm of boron, and

d. A nitrogen cover-pressure of between 599 and 667 psig.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in HOT SHUTDOWN within the next 12 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and

2. Verifying that each accumulator isolation valve is open.

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* Pressurizer Pressure above 1000 psig. Power lock out of valves is not permitted in MODE 3 when below 1000 psig.

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 466,200 and 487,000 gallons.

b. Between 2600 and 2800 ppm of boron, and

c. A solution temperature between 40°F and 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the refueling water storage tank 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.

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of:

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

b. One casing cooling tank (shared with both trains) shall be OPERABLE with:

1. Contained borated water volume of at least 116,500 gallons.
2. Between 2600 and 2800 ppm boron concentration.
3. A solution temperature ≥ 35°F and ≤ 50°F.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2.1 Each containment recirculation spray subsystem and casing cooling subsystem shall be demonstrated OPERABLE:

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

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of ≥ 2600 ppm.

APPLICABILITY: Mode 6*

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATION or positive reactivity changes and initiate and continue boration at ≥ 10 gpm of ≥ 12,950 ppm boric acid solution or its equivalent until K_{eff} is reduced to ≤ 0.95 or the boron concentration is restored to ≥ 2600 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length control rod located within the reactor pressure vessel, in excess of 3 feet from its fully inserted position.

4.9.1.2 The boron concentration of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

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* The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

3/4.1.2 BORATION SYSTEMS

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

With the RCS average temperature above 200°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 operation conditions of 1.77% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of 2600 ppm borated water from the refueling water storage tank.

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

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 270°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% delta k/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of 2600 ppm borated water from the refueling water storage tank.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a 1% $\Delta k/k$ conservative allowance for uncertainties. Similarly, the boron concentration of 2600 ppm or greater includes a conservative uncertainty allowance of 50 ppm boron.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive materials release from a fuel element rupture based upon a lack of containment pressurization potential while in the REFUELING MODE.

OPERABILITY of the containment airlock door requires that the door is capable of being closed, that the door is unblocked and no cables or hoses are being run through the airlock, and that a designated individual is continuously available to close the airlock door. This individual must be stationed near the airlock.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

Attachment 4

Significant Hazards Consideration Determination

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Virginia Electric and Power Company (Virginia Power) outage planning philosophy has been to stagger outages whenever possible in order to avoid load management, logistical and economic disadvantages associated with concurrent outages. In order to accommodate this outage planning philosophy, the fuel management plan for each unit provides for flexibility in the final end-of-cycle burnup including the use of power and average temperature coastdowns. By reducing end of cycle temperature coastdowns we can maximize electrical generation and increase operational flexibility. In order to reduce temperature coastdowns, increased initial core reactivity is necessary which require higher boron concentrations than permitted by Technical Specifications to meet increased shutdown requirements.

Virginia Electric and Power Company has reviewed the requirements of 10 CFR 50.92 as they relate to the proposed changes for the North Anna Units 1 and 2 and determined that a significant hazards consideration is not involved. The evaluations concluded that the proposed increased boron concentration limits for the Refueling Water Storage Tank (RWST), Casing Cooling Tank (CCT) and Safety Injection Accumulators (SIAs) generally provide an analytical benefit from a reactivity management and accident mitigation standpoint. The following is provided to support this conclusion.

- Does the change involve a significant increase in the probability or consequences of an accident previously evaluated

  Increased boron concentration limits for the RWST, CCT, SIAs, and Spent Fuel Pool (SFP) will not increase the consequences of an accident previously evaluated. The increased boron concentration limits reduce the time to switchover from cold to hot leg recirculation, which will prevent boron precipitation in the reactor vessel following a loss of coolant accident (LOCA). The post-LOCA sump boron concentration limit is revised to ensure adequate post-LOCA shutdown margin. The post-LOCA containment sump and quench spray (QS) pH remain within the limits specified in the Standard Review Plan. All other transients either were not impacted or were made less severe as a result of the increased boron concentrations.

- Does the change create the possibility of a new or different kind of accident from any accident previously evaluated

  The proposed increase in boron concentration does not add new or different equipment to the facility, nor does this change the manner that plant equipment is being operated. Although the increased boron concentration requires procedure changes to ensure that cold to hot leg (reactor coolant loops) recirculation after an accident occurs earlier in the event, there are no changes to the methods utilized to respond to plant transients. The proposed Technical Specification changes do

not alter instrumentation setpoints that initiate protective or mitigative actions. As a result, no new failure modes are being introduced. Therefore, the possibility for an accident of a different type than was previously evaluated in the Safety Analysis Report is not created.

- Does the change involve a significant reduction in a margin of safety

  The LOCA considerations, including the recirculation switchover time, the post-LOCA sump boron concentration limit, and the quench spray and post-LOCA sump pH have been evaluated and found to be acceptable. The acceptance criteria of all non-LOCA transients continue to be met. Therefore, there is no significant reduction in the margin of safety margin of safety in the accident analyses impacted by boron concentration increases in the RWST, CCT, SIAs, and SFP.