VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 23, 2004

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

Serial No. 03-586
NAPS/JHL
Docket Nos. 50-338/339
License Nos. NPF-4/7

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
DELETION OF NOTE REFERRING TO DIFFERENCES
BETWEEN UNIT 1 AND 2 BORON CONCENTRATIONS

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company (Dominion) requests an amendment to Facility Operating License Numbers NPF-4 and NPF-7 in the form of a change to the Technical Specifications for North Anna Power Station Units 1 and 2. The proposed change revises Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 to delete a note referring to differences in Units 1 and 2 boron concentrations for the Safety Injection Accumulators, Refueling Water Storage Tank, and Casing Cooling Tank.

A discussion of the proposed change is included in Attachment 1. The Technical Specification marked-up pages that reflect the proposed changes and the Technical Specification pages that incorporate the proposed changes are provided in Attachments 2 and 3, respectively. In addition, Technical Specification Bases changes reflecting the proposed changes are included for information only. The Technical Specification Bases will be revised in accordance with the Technical Specification Bases Control Program, Technical Specification 5.5.13, following NRC approval of the license amendment.

The proposed changes have been reviewed and approved by the Station Nuclear Safety and Operating Committee and the Management Safety Review Committee.

In accordance with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards. In addition, the proposed change has been determined to qualify for categorical exclusion from an environmental assessment as

A001

set forth in 10 CFR 51.22(c)(9). The basis for these determinations is included in Attachment 1.

Once approved the amendment will be implemented within 30 days. Should you have any questions or require additional information, please contact Jay Leberstien at (540) 894-2574.

Very truly yours,

Leslie N. Hartz
Vice President – Nuclear Engineering

Commitments made is this letter: None

Attachments:
1. Discussion of Change
2. Mark-up of Technical Specifications
3. Proposed Technical Specifications

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SN: 03-586
Docket Nos.: 50-338/339
Subject: Proposed TS Change
Deletion of Note Referring to Diff. In
U1 & U2 Boron Concentrations

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President - Nuclear Engineering, of Virginia Electric and Power Company. She has affirmed before me that she 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 her knowledge and belief.

Acknowledged before me this 23rd day of January, 2004.

My Commission Expires: March 31, 2004.

Maggie McClure
Notary Public

(SEAL)

Attachment 1

Discussion of Change

North Anna Power Station Units 1 and 2
Virginia Electric and Power Company
(Dominion)

DISCUSSION OF CHANGES

Introduction

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company (Dominion) requests an amendment to Facility Operating License Numbers NPF-4 and NPF-7 in the form of changes to the Technical Specifications (TS) for North Anna Power Station Units 1 and 2. The proposed changes are administrative in nature and are requested to delete a note differentiating between Unit 1 and 2 boron concentrations for TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3. Further discussion on the reason for the deletion of the note is provided below.

Discussion

License Amendment Nos. 225 and 206 dated March 21, 2001 revised the boron concentration limits in the safety injection accumulators, refueling water storage tank (RWST), casing cooling tank, and reactor coolant system during refueling. Implementation of the amendments was scheduled to be performed on a staggered basis during the Unit 1 Fall 2001 refueling outage and the Unit 2 Fall 2002 refueling outage.

Following the implementation of License Amendment No. 225 for North Anna Unit 1 in Fall 2001 and prior to the implementation of License Amendment No. 206 during the Fall 2002, a conversion to the Improved Technical Specifications (ITS) occurred. This required that a Note be added to TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 to differentiate between Unit 1 and 2 boron concentrations. License Amendment No. 206 was subsequently implemented during the Unit 2 Fall 2002 refueling outage.

It is requested that a change to TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 be approved in order to delete a Note differentiating between Unit 1 and 2 boron concentrations. Now that License Amendment Nos. 225 and 206 have been implemented on North Anna Units 1 and 2, there is no longer a need for the note. The proposed changes do not change the operation of the plant. The changes are administrative in nature.

TS Bases changes, reflecting the proposed changes are included for information only. The TS Bases will be revised in accordance with the TS Bases Control Program, TS 5.5.13 following NRC approval of the license amendment.

Proposed Changes

TS Surveillance Requirement 3.5.1.4 is to be revised to delete the Note that states:

> ----------NOTE----------
> --
> For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the accumulator boron concentration acceptance criteria shall be ≥ 2200 ppm and ≤ 2400 ppm.
> ----------
> --

TS Surveillance Requirement 3.5.4.3 is to be revised to delete the Note that states:

> ----------NOTE----------
> --
> For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the RWST boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.
> ----------
> --

TS Surveillance Requirement 3.6.7.3 is to be revised to delete the Note that states:

> ----------NOTE----------
> -
> For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the casing cooling tank boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.
> ----------
> --

No Significant Hazards Consideration

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

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

The proposed changes to TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 delete a note that is no longer necessary and do not alter any plant equipment or operating practices in such a manner that the probability of an accident is increased. The proposed changes will not alter assumptions relative to the mitigation of an accident or transient event.

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

   The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in the methods governing normal plant operation. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed changes do not alter the boron concentrations in the safety injection accumulators, RWST, and casing cooling tank. The proposed changes to TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 are considered administrative in nature. Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

Based on the above, Dominion concludes that the proposed changes do not present a 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.

Environmental Assessment

This amendment request meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) as follows:

(i) The amendment involves no significant hazards consideration.

As described above, the proposed changes involve no significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed changes do not involve the installation of any new equipment, or the modification of any equipment that may affect the types or amounts of effluents that may be released offsite. Therefore, there is no significant change

in the types or significant increase in the amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupation radiation exposure.

The proposed changes do not involve plant physical changes, or introduce any new mode of plant operation. Therefore, there is no significant increase in individual or cumulative occupational radiation exposure.

Based on the above, Dominion concludes that the proposed changes meet the criteria specified in 10 CFR 51.22 for a categorical exclusion from the requirements of 10 CFR 51.22 relative to requiring a specific environmental assessment by the Commission.

Conclusion

The proposed changes are administrative in nature. The changes only delete a note in TS Surveillance Requirements 3.5.1.4, 3.5.4.3, and 3.6.7.3 that is no longer applicable. License Amendments 225 and 206 were implemented in the Fall 2001 for Unit 1 and Fall 2002 for Unit 2 and there is no longer a reason to differentiate between boron concentrations. No changes are being made to the operation of North Anna Units 1 and 2 as a result of the proposed changes.

The Station Nuclear Safety and Operating Committee (SNSOC) and the Management Safety Review Committee (MSRC) have reviewed this proposed change to the Technical Specifications and have concluded that it does not involve a significant hazards consideration and will not endanger the health and safety of the public.

Attachment 2

Mark-up of
Technical Specifications Change

North Anna Power Station Units 1 and 2
Virginia Electric and Power Company
(Dominion)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 7580 gallons and ≤ 7756 gallons.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 599 psig and ≤ 667 psig.	12 hours
SR 3.5.1.4	~~NOTE~~ ~~For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the accumulator boron concentration acceptance criteria shall be ≥ 2200 ppm and ≤ 2400 ppm.~~ Verify boron concentration in each accumulator is ≥ 2500 ppm and ≤ 2800 ppm.	31 days AND -----NOTE------ Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 50% of indicated level that is not the result of addition from the refueling water storage tank

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	Verify RWST borated water temperature is ≥ 40°F and ≤ 50°F.	24 hours
SR 3.5.4.2	Verify RWST borated water volume is ≥ 466,200 gallons and ≤ 487,000 gallons.	7 days
SR 3.5.4.3	~~NOTE~~ ~~For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the RWST boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.~~	
	Verify RWST boron concentration is ≥ 2600 ppm and ≤ 2800 ppm.	7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One outside RS subsystem and one inside RS subsystem inoperable and not in the same train. OR Three or more RS subsystems inoperable. OR Two outside RS subsystems inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify casing cooling tank temperature is ≥ 35°F and ≤ 50°F.	24 hours
SR 3.6.7.2	Verify casing cooling tank contained borated water volume is ≥ 116,500 gal.	7 days
SR 3.6.7.3	~~NOTE~~ ~~For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the casing cooling tank boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.~~ Verify casing cooling tank boron concentration is ≥ 2600 ppm and ≤ 2800 ppm.	7 days

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2 and SR 3.5.1.3

Every 12 hours, borated water volume and nitrogen cover pressure are verified for each accumulator. This Frequency is sufficient to ensure adequate injection during a LOCA. Because of the static design of the accumulator, a 12 hour Frequency usually allows the operator to identify changes before limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator every 31 days since the static design of the accumulators limits the ways in which the concentration can be changed. ~~A Note states that for Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the accumulator boron concentration acceptance criteria shall be ≥ 2200 ppm and ≤ 2400 ppm.~~ The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Sampling the affected accumulator within 6 hours after a 50% increase of indicated level will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the refueling water storage tank (RWST), because the water contained in the RWST is within the accumulator boron concentration requirements. This is consistent with the recommendation of NUREG-1366 (Ref. 3).

Although the run of piping between the two accumulator discharge check valves is credited in demonstrating compliance with Technical Specification 3.5.1 minimum accumulator volume requirement, the minimum boron concentration requirement does not apply to this run of piping. Applicable accident analyses have explicitly considered in-leakage from the RCS, and the resulting reduction in boron concentration in this run of piping, which is not sampled.

SR 3.5.1.5

Verification every 31 days that power is removed from each accumulator isolation valve operator when the RCS pressure is ≥ 2000 psig ensures that an active failure could not

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BASES

APPLICABLE SAFETY ANALYSES (continued)

available volume. The deliverable volume limit is assumed by the Large Break LOCA containment analyses. For the RWST, the deliverable volume is different from the total volume contained. Because of the design of the tank, more water can be contained than can be delivered. The upper RWST volume limit is assumed for pH control after a LBLOCA. The minimum boron concentration is an explicit assumption in the main steam line break (MSLB) analysis to ensure the required shutdown capability. The importance of its value is small because of the boron injection tank (BIT) with a high boron concentration. The maximum boron concentration is an explicit assumption in the inadvertent ECCS actuation analysis, although it is typically a nonlimiting event and the results are very insensitive to boron concentrations. The maximum RWST temperature ensures that the amount of containment cooling provided from the RWST during containment pressurization events is consistent with safety analysis assumptions. The minimum RWST temperature is an assumption in the inadvertent Quench Spray actuation analyses.

For a large break LOCA analysis, the minimum water volume limit of 466,200 gallons and the lower boron concentration limit of 2600 ppm are used to compute the post LOCA sump boron concentration necessary to assure subcriticality. ~~For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the minimum RWST boron concentration acceptance criteria shall be ≥ 2300 ppm.~~ The large break LOCA is the limiting case since the safety analysis assumes that all control rods are out of the core.

The upper limit on boron concentration of 2800 ppm is used to determine the maximum allowable time to switch to hot leg recirculation following a LOCA. ~~For Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the maximum RWST boron concentration acceptance criteria shall be ≤ 2400 ppm.~~ The purpose of switching from cold leg to hot leg injection is to avoid boron precipitation in the core following the accident.

In the ECCS analysis, the quench spray temperature is bounded by the RWST lower temperature limit of 40°F. If the lower temperature limit is violated, the quench spray further reduces containment pressure, which decreases the rate at which steam can be vented out the break and increases peak clad temperature. The upper temperature limit of 50°F is bounded by the values used in the small break LOCA analysis

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.4.2 (continued)

support continued ECCS and Recirculation Spray System pump operation on recirculation. Since the RWST volume is normally stable and is protected by an alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

SR 3.5.4.3

The boron concentration of the RWST should be verified every 7 days to be within the required limits. ~~A Note states that for Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the RWST boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.~~ This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

REFERENCES

1. UFSAR, Chapter 6 and Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1 (continued)

the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.2

Verifying the casing cooling tank contained borated water volume provides assurance that sufficient water is available to support the outside RS subsystem pumps during the time they are required to operate. The 7 day Frequency of this SR was developed considering operating experience related to the parameter variations and instrument drift during the applicable MODES. Furthermore, the 7 day Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.3

Verifying the boron concentration of the solution in the casing cooling tank provides assurance that borated water added from the casing cooling tank to RS subsystems will not dilute the solution being recirculated in the containment sump. ~~A Note states that for Unit 2, until the first entry into MODE 4 following the Unit 2 Fall 2002 refueling outage, the casing cooling tank boron concentration acceptance criteria shall be ≥ 2300 ppm and ≤ 2400 ppm.~~ The 7 day Frequency of this SR was developed considering the known stability of stored borated water and the low probability of any source of diluting pure water.

SR 3.6.7.4

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the RS System and casing cooling tank provides assurance that the proper flow path exists for operation of the RS System. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified as being in the correct position prior to being secured. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position.

Attachment 3

Proposed Technical Specifications Changes

North Anna Power Station Units 1 and 2
Virginia Electric and Power Company
(Dominion)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 7580 gallons and ≤ 7756 gallons.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 599 psig and ≤ 667 psig.	12 hours
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2500 ppm and ≤ 2800 ppm.	31 days AND -----NOTE------ Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 50% of indicated level that is not the result of addition from the refueling water storage tank
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is ≥ 2000 psig.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	Verify RWST borated water temperature is ≥ 40°F and ≤ 50°F.	24 hours
SR 3.5.4.2	Verify RWST borated water volume is ≥ 466,200 gallons and ≤ 487,000 gallons.	7 days
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2600 ppm and ≤ 2800 ppm.	7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One outside RS subsystem and one inside RS subsystem inoperable and not in the same train. OR Three or more RS subsystems inoperable. OR Two outside RS subsystems inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify casing cooling tank temperature is ≥ 35°F and ≤ 50°F.	24 hours
SR 3.6.7.2	Verify casing cooling tank contained borated water volume is ≥ 116,500 gal.	7 days
SR 3.6.7.3	Verify casing cooling tank boron concentration is ≥ 2600 ppm and ≤ 2800 ppm.	7 days
SR 3.6.7.4	Verify each RS and casing cooling manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 days
SR 3.6.7.5	Verify each RS and casing cooling pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.6	Verify on an actual or simulated actuation signal(s): a. Each RS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position; b. Each RS pump starts automatically; and c. Each casing cooling pump starts automatically.	18 months
SR 3.6.7.7	Verify each spray nozzle is unobstructed.	Following maintenance which could cause nozzle blockage

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2 and SR 3.5.1.3

Every 12 hours, borated water volume and nitrogen cover pressure are verified for each accumulator. This Frequency is sufficient to ensure adequate injection during a LOCA. Because of the static design of the accumulator, a 12 hour Frequency usually allows the operator to identify changes before limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator every 31 days since the static design of the accumulators limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Sampling the affected accumulator within 6 hours after a 50% increase of indicated level will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the refueling water storage tank (RWST), because the water contained in the RWST is within the accumulator boron concentration requirements. This is consistent with the recommendation of NUREG-1366 (Ref. 3).

Although the run of piping between the two accumulator discharge check valves is credited in demonstrating compliance with Technical Specification 3.5.1 minimum accumulator volume requirement, the minimum boron concentration requirement does not apply to this run of piping. Applicable accident analyses have explicitly considered in-leakage from the RCS, and the resulting reduction in boron concentration in this run of piping, which is not sampled.

SR 3.5.1.5

Verification every 31 days that power is removed from each accumulator isolation valve operator when the RCS pressure is ≥ 2000 psig ensures that an active failure could not result in the closure of an accumulator motor operated isolation valve. If this were to occur, only one accumulator would be available for injection given a single failure

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.1.5 (continued)

coincident with a LOCA. Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that power is removed.

This SR allows power to be supplied to the motor operated isolation valves when RCS pressure is < 2000 psig, thus allowing operational flexibility by avoiding unnecessary delays to manipulate the breakers during unit startups or shutdowns.

REFERENCES

1. UFSAR, Chapter 6 and Chapter 15.

2. 10 CFR 50.46.

3. NUREG-1366, February 1990.

BASES

APPLICABLE SAFETY ANALYSES (continued)

available volume. The deliverable volume limit is assumed by the Large Break LOCA containment analyses. For the RWST, the deliverable volume is different from the total volume contained. Because of the design of the tank, more water can be contained than can be delivered. The upper RWST volume limit is assumed for pH control after a LBLOCA. The minimum boron concentration is an explicit assumption in the main steam line break (MSLB) analysis to ensure the required shutdown capability. The importance of its value is small because of the boron injection tank (BIT) with a high boron concentration. The maximum boron concentration is an explicit assumption in the inadvertent ECCS actuation analysis, although it is typically a nonlimiting event and the results are very insensitive to boron concentrations. The maximum RWST temperature ensures that the amount of containment cooling provided from the RWST during containment pressurization events is consistent with safety analysis assumptions. The minimum RWST temperature is an assumption in the inadvertent Quench Spray actuation analyses.

For a large break LOCA analysis, the minimum water volume limit of 466,200 gallons and the lower boron concentration limit of 2600 ppm are used to compute the post LOCA sump boron concentration necessary to assure subcriticality. The large break LOCA is the limiting case since the safety analysis assumes that all control rods are out of the core.

The upper limit on boron concentration of 2800 ppm is used to determine the maximum allowable time to switch to hot leg recirculation following a LOCA. The purpose of switching from cold leg to hot leg injection is to avoid boron precipitation in the core following the accident.

In the ECCS analysis, the quench spray temperature is bounded by the RWST lower temperature limit of 40°F. If the lower temperature limit is violated, the quench spray further reduces containment pressure, which decreases the rate at which steam can be vented out the break and increases peak clad temperature. The upper temperature limit of 50°F is bounded by the values used in the small break LOCA analysis and containment OPERABILITY analysis. Exceeding this temperature will result in a higher peak clad temperature, because there is less heat transfer from the core to the injected water for the small break LOCA and higher containment pressures due to reduced quench spray cooling capacity. For the containment response following an MSLB,

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

the lower limit on boron concentration and the upper limit on RWST water temperature are used to maximize the total energy release to containment.

The RWST satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The RWST ensures that an adequate supply of borated water is available to cool and depressurize the containment in the event of a Design Basis Accident (DBA), to cool and cover the core in the event of a LOCA, to maintain the reactor subcritical following a DBA, and to ensure adequate level in the containment sump to support ECCS and Recirculation Spray System pump operation in the recirculation mode.

To be considered OPERABLE, the RWST must meet the water volume, boron concentration, and temperature limits established in the SRs.

APPLICABILITY

In MODES 1, 2, 3, and 4, RWST OPERABILITY requirements are dictated by ECCS and Quench Spray System OPERABILITY requirements. Since both the ECCS and the Quench Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the RWST must also be OPERABLE to support their operation. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops—MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation—High Water Level," and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation—Low Water Level."

ACTIONS

A.1

With RWST boron concentration or borated water temperature not within limits, they must be returned to within limits within 8 hours. Under these conditions neither the ECCS nor the Quench Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE condition. The 8 hour limit to restore the RWST temperature or boron concentration to within limits was developed considering the time required to change either the boron concentration or temperature and the fact that the contents of the tank are still available for injection.

BASES

ACTIONS (continued)

B.1

With the RWST inoperable for reasons other than Condition A (e.g., water volume), it must be restored to OPERABLE status within 1 hour.

In this Condition, neither the ECCS nor the Quench Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the unit in a MODE in which the RWST is not required. The short time limit of 1 hour to restore the RWST to OPERABLE status is based on this condition simultaneously affecting redundant trains.

C.1 and C.2

If the RWST cannot be returned to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

The RWST borated water temperature should be verified every 24 hours to be within the limits assumed in the accident analyses band. This Frequency is sufficient to identify a temperature change that would approach either limit and has been shown to be acceptable through operating experience.

SR 3.5.4.2

The RWST water volume should be verified every 7 days to be above the required minimum level in order to ensure that a sufficient initial supply is available for injection and to support continued ECCS and Recirculation Spray System pump operation on recirculation. Since the RWST volume is normally stable and is protected by an alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.3

The boron concentration of the RWST should be verified every 7 days to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

REFERENCES

1. UFSAR, Chapter 6 and Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1 (continued)

the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.2

Verifying the casing cooling tank contained borated water volume provides assurance that sufficient water is available to support the outside RS subsystem pumps during the time they are required to operate. The 7 day Frequency of this SR was developed considering operating experience related to the parameter variations and instrument drift during the applicable MODES. Furthermore, the 7 day Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.3

Verifying the boron concentration of the solution in the casing cooling tank provides assurance that borated water added from the casing cooling tank to RS subsystems will not dilute the solution being recirculated in the containment sump. The 7 day Frequency of this SR was developed considering the known stability of stored borated water and the low probability of any source of diluting pure water.

SR 3.6.7.4

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the RS System and casing cooling tank provides assurance that the proper flow path exists for operation of the RS System. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified as being in the correct position prior to being secured. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position.