UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 22, 2001

Mr. David A. Christian
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: SURRY UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: RETURN OF ISOLATED REACTOR COOLANT SYSTEM (RCS) LOOPS TO SERVICE (TAC NOS. MB0778 AND MB0779)

Dear Mr. Christian:

The Commission has issued the enclosed Amendment No. 226 to Facility Operating License No. DPR-32 and Amendment No. 226 to Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments change the Technical Specifications (TS) in response to your application transmitted by letter dated December 12, 2000, as supplemented by letters dated January 8, and February 22, 2001.

The amendments revise TS Section 3.17 and associated Bases. The proposed changes will accommodate a vacuum-assisted fill technique for backfilling isolated reactor coolant system (RCS) loops from the active volume of the RCS.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

G E Edison

Gordon E. Edison, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosures:
1. Amendment No. 226 to DPR-32
2. Amendment No. 226 to DPR-37
3. Safety Evaluation

cc w/encls: See next page

NRR-058

Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Distribution: See next page

May 22, 2001

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DATED: May 22, 2001

AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-32 - SURRY UNIT 1
AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-37 - SURRY UNIT 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 226
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated December 12, 2000, as supplemented January 8, and February 22, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-32 is hereby amended to read as follows:

   (B) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 226 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

FOR

Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 22, 2001

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 226
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated December 12, 2000, as supplemented January 8, and February 22, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

   (B) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 226 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for

Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 22, 2001

ATTACHMENT TO

LICENSE AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-32

LICENSE AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Remove Page	Insert Page
TS 3.17-2	TS 3.17-2
TS 3.17-3	TS 3.17-3
TS 3.17-4	TS 3.17-4
TS 3.17-5	TS 3.17-5
-------	TS 3.17-6
-------	TS 3.17-7
-------	TS 3.17-8

b. Before opening the hot leg loop stop valve.

1) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration corresponding to the shutdown margin requirements of Specification 1.0.C.2 or 3.10.A.9, as applicable for the active volume of the Reactor Coolant System. Verification of this condition shall be completed within 1 hour prior to opening the hot leg stop valve in the isolated loop.

c. Before opening the cold leg loop stop valve.

1) The hot leg loop stop valve shall be open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm.

2) The cold leg temperature of the isolated loop shall be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. Verification of this condition shall be completed within 30 minutes prior to opening the cold leg stop valve in the isolated loop.

3) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration corresponding to the shutdown margin requirements of Specification 1.0.C.2 or 3.10.A.9, as applicable for the active volume of the Reactor Coolant System. Verification of this condition shall be completed after relief line flow for at least 90 minutes at greater than or equal to 125 gpm and within 1 hour prior to opening the cold leg stop valve in the isolated loop.

5. Whenever an isolated and drained reactor coolant loop is filled from the active volume of the RCS, the following conditions shall apply:

a. Seal injection may be initiated to the reactor coolant pump in the isolated loop provided that:

1) The isolated loop is drained. Verification of this condition shall be completed within 2 hours prior to initiating seal injection.

2) The boron concentration of the source for reactor coolant pump seal injection shall be greater than or equal to the boron concentration corresponding to the shutdown margin requirements of Specification 1.0.C.2 or 3.10.A.9, as applicable for the active volume of the Reactor Coolant System. If using the Volume Control Tank (VCT) as the source for reactor coolant pump seal injection. verification of the boron concentration shall be completed within 1 hour prior to initiating seal injection and every hour thereafter during the loop backfill evolution.

b. The cold leg loop stop valve may be energized and/or opened to backfill the loop from the active volume of the Reactor Coolant System provided that:

1) The isolated loop is drained or reactor coolant pump seal injection has been initiated in accordance with Specification 3.17.5.a above. Verification of the loop being drained shall be completed within 2 hours prior to partially opening the cold leg stop valve in the isolated loop.

2) The Reactor Coolant System level is at least 18 ft.

3) A source range nuclear instrumentation channel is OPERABLE with audible indication in the control room.

c. Backfilling of the isolated loop may continue provided that:

1) The Reactor Coolant System level is maintained at or above 18 ft. If Reactor Coolant System level is not maintained at or above 18 ft. the loop stop valve shall be closed.

2) The boron concentration of the reactor coolant pump seal injection source is greater than or equal to the boron concentration corresponding to the shutdown margin requirements of Specification 1.0.C.2 or 3.10.A.9, as applicable for the active volume of the Reactor Coolant System. If the boron concentration is not maintained greater than or equal to the required boron concentration noted above, the loop stop valve on the loop being backfilled shall be closed and either drain the loop or apply Specification 3.17.4.

3) A source range nuclear instrumentation channel is OPERABLE and continuously monitored with audible indication in the control room during the backfill evolution. Should the count rate increase by more than a factor of two over the initial count rate, the cold leg loop stop valve shall be closed and no attempt made to open the cold leg stop valve until the reason for the count rate increase has been determined.

d. When the isolated loop is full, the cold leg loop stop valve can be fully opened and the hot leg loop stop valve opened provided that:

1) The boron concentration of the isolated loop is greater than or equal to the boron concentration corresponding to the shutdown margin requirements of Specification 1.0.C.2 or 3.10.A.9, as applicable for the active volume of the Reactor Coolant System. If the VCT was used as the source for reactor coolant pump seal injection, this condition shall be verified within 1 hour prior to fully opening the loop stop valves. If the boron concentration in the isolated loop does not meet the condition above, close the loop stop valve and either drain the loop or apply Specification 3.17.4.

2) The hot and cold leg loop stop valves are opened within 2 hours after the isolated loop is filled. If the loop stop valves are not fully open within 2 hours, close the loop stop valves and either drain the loop or apply Specification 3.17.4.

Basis

The Reactor Coolant System may be operated with isolated loops in COLD SHUTDOWN or REFUELING SHUTDOWN in order to perform maintenance. A loop stop valve in any loop can be closed for up to two hours without restriction for testing or maintenance in these operating conditions. While operating with a loop isolated, AC power is removed from the loop stop valves and their breakers locked opened to prevent inadvertent opening. When the isolated loop is returned to service, the coolant in the isolated loop

mixes with the coolant in the active loops. This situation has the potential of causing a positive reactivity addition with a corresponding reduction of shutdown margin if:

a. The temperature in the isolated loop is lower than the temperature in the active loops (cold water accident), or

b. The boron concentration in the isolated loop is insufficient to maintain the required shutdown margin (boron dilution accident).

The return to service of an isolated and filled loop is done in a controlled manner that precludes the possibility of an uncontrolled positive reactivity addition from cold water or boron dilution. A flow path to mix the isolated loop with the active loops is established through the relief line by opening the hot leg stop valve in the isolated loop and starting the reactor coolant pump. The relief line flow is low enough to limit the rate of any reactivity addition due to differences in temperature and boron concentration between the isolated loop and the active loops. In addition, a source range instrument channel is required to be operable and continuously monitored to detect any change in core reactivity.

The limiting conditions for returning an isolated and filled loop to service are as follows:

a. A hot leg loop stop valve may not be opened unless the boron concentration in the isolated loop is greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

b. A cold leg loop stop valve can not be opened unless the hot leg loop stop valve is open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm. In addition, the cold leg temperature of the isolated loop must be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. The boron concentration in the isolated loop must be verified to be greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition during hot or cold leg stop valve opening and during relief line flow.

If an isolated loop is initially drained, the above requirements are not applicable. An initially isolated and drained loop may be returned to service by partially opening the cold leg loop stop valve and filling the loop in a controlled manner from the Reactor Coolant System. To eliminate numerous reactor coolant pump jogs to completely fill a drained loop, a partial vacuum may be established in the isolated loop prior to commencing filling from the active volume of the Reactor Coolant System. The vacuum-assist loop fill evolution requires initiating seal injection to the reactor coolant pump to permit establishing an adequate vacuum in the isolated loop. A portion of the reactor coolant pump seal injection enters the isolated loop. To preclude the possibility of an uncontrolled positive reactivity addition associated with the water injected into the isolated and drained loop from the seal injection, a water source of known boron concentration is used.

Prior to initiating seal injection to the reactor coolant pump in an isolated loop or partially opening the cold leg loop stop valve, the following measures are required to ensure that no uncontrolled positive reactivity addition or loss of Reactor Coolant System inventory occurs:

a. The isolated loop is verified drained prior to the initial addition of water to return a loop to service, thus preventing the dilution of the Reactor Coolant System boron concentration by liquid present in the loop. Therefore, verification that the loop is drained must occur either prior to initiation of seal injection to the Reactor Coolant Pump if the vacuum-assist backfill method is used or prior to opening the cold leg loop stop valve if the vacuum-assist backfill method is not used.

b. The Reactor Coolant System level is verified to be greater than or equal to the 18 ft. elevation to ensure Reactor Coolant System inventory is maintained for decay heat removal. In addition, the filling evolution is limited to one isolated loop at a time.

c. The water source for the reactor coolant pump seal injection is sampled to ensure the boron concentration is greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

d. A source range nuclear instrument channel is monitored to detect any unexpected positive reactivity addition.

During the loop fill evolution, the following measures are implemented to ensure no positive reactivity additions or sudden loss of Reactor Coolant System inventory occur:

a. The Reactor Coolant System is maintained at greater than or equal to the 18 ft. elevation.

b. Makeup to the active portion of the Reactor Coolant System is through a flowpath that will ensure makeup flow is mixed with the reactor coolant in the active portion of the Reactor Coolant System and flows through the core prior to entering the loop being filled.

c. Charging flow from the VCT, if used as the source for reactor coolant pump seal injection, is periodically sampled to ensure the boron concentration is greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

d. The source range nuclear instrumentation channel is monitored to provide a secondary indication of any possible positive reactivity addition.

The potential reactivity effects due to Reactor Coolant System cooldown during and following loop backfill are limited to acceptable levels by the small absolute value of the isothermal temperature coefficient of reactivity that exists at cold and refueling shutdown conditions. If steam generator secondary temperature is higher than the active portion of the Reactor Coolant System, a conservative heat transfer analysis demonstrates that 1) the pressurizer insurge rates that could result from heatup are easily accommodated by available relief capacity, and 2) the total integrated insurge due to heatup following backfill is very small, i.e., less than the unmeasured pressurizer volume above the upper level tap.

Reactivity effects due to boron stratification in the backfilled loop are not a concern since stratification is not expected to take place at the normal shutdown boron concentrations (2000-2400 ppm) and temperatures (40°F-200°F) during the time to complete backfill of the loop and open the loop stop valves fully.

After an initially drained loop is filled from the Reactor Coolant System by partially opening the loop stop valves, the loop is no longer considered to be isolated. Thus, the requirements for returning an isolated and filled loop to service are not applicable and the loop stop valves may be fully opened without restriction within two hours of completing the loop fill evolution.

The initial Reactor Coolant System level requirement has been established such that, even if the three cold leg stop valves are suddenly opened and no makeup is available, the Reactor Coolant System water level will not drop below mid-nozzle level. This ensures continued adequate suction conditions for the residual heat removal pumps.

The safety analyses assume a minimum shutdown margin as an initial condition. Violation of these limiting conditions could result in the shutdown margin being reduced to less than that assumed in the safety analyses. In addition, violation of these limiting conditions could also cause a loss of shutdown decay heat removal.

Reference

(1) UFSAR Section 4.2

(2) UFSAR Section 14.2.5

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-32

AND AMENDMENT NO. 226 TO FACILITY OPERATING LICENSE NO. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

Currently, the reactor coolant pumps (RCPs) at the Surry Power Station, Units 1 and 2, are used (through numerous starts) to eliminate entrapped air when filling a drained reactor coolant system (RCS) loop. Virginia Electric and Power Company (VEPCO, the licensee) has submitted a request to implement a technique that would draw a partial vacuum in the isolated loop prior to backfilling the loop. This technique would eliminate the entrapped air without the need for numerous RCP starts. In order to establish a partial vacuum in the isolated loop, RCP seal injection to the isolated loop is required. However, current Technical Specifications (TS) require that the loop be verified drained prior to opening the loop isolation valves for backfilling the isolated loop from the active RCS volume. With the use of RCP seal injection, the isolated loop would not be drained, and the current TS would prevent the licensee from implementing this technique.

By letter dated October 25, 1999, the licensee requested changes to the TS for Surry Power Station, Units 1 and 2. The changes would have permitted the licensee to use the vacuum-assisted fill technique for returning isolated RCS loops to service. As a result of questions raised by the staff regarding controls on boron concentration and temperature of the isolated loops and the effects of these parameters on shutdown margin, the licensee revised the changes requested in its October 25, 1999, submittal and provided a new submittal dated December 12, 2000, which superseded the previous submittal in its entirety. The December 12, 2000, submittal included proposed changes to TS 3.17.4.b.1, TS 3.17.4.c.3, and TS 3.17.5, and TS Bases Section 3.17. The changes proposed by VEPCO would allow the licensee to implement the vacuum-assisted backfill technique when returning an isolated RCS loop to service and provide the necessary controls for temperature and boron concentration of the isolated RCS loop to ensure that the required shutdown margin is maintained. Due to a pagination error, two lines from the December 12, 2000, submittal were missing. By letter dated January 8, 2001, VEPCO corrected this problem. Upon review of the submittals, the staff raised questions regarding loop pressurization and reactivity insertion. VEPCO answered these questions in a February 1, 2001, telephone conference and submitted its response in a letter dated February 22, 2001.

Enclosure

2.0 EVALUATION

2.1 Vacuum-Assisted Backfill

The TS being revised provide necessary controls to ensure that the preconditions related to reactivity for the startup of an inactive RCS loop are acceptable. In addition, the subject TS ensure that the backfill evolution does not result in a loss of shutdown cooling. The existing TS provide this assurance for the non-vacuum-assisted backfill technique by requiring: (1) the loop to be verified drained before commencing backfill of the loop from the active volume of the RCS; (2) operable source range instrumentation to provide secondary indication on any RCS makeup boron concentration discrepancy; and (3) a minimum RCS volume to ensure that the decay heat removal capability is not challenged. In addition, conservatively bounding analyses were performed and demonstrated that the reactivity effects of temperature differences between the isolated and non-isolated portions of the RCS will not result in a significant reactivity insertion. Except for the changes discussed in Sections 2.1 and 2.2 of this Safety Evaluation (SE), the licensee's proposed modifications do not affect the requirements related to the non-vacuum-assisted backfill technique.

The licensee's request would allow the licensee to implement a vacuum-assisted backfill technique during which seal injection water, from various sources, would be injected into the isolated and drained loop prior to opening the isolation valves (i.e., connecting the isolated loop to the active volume of the RCS). This procedure allows an isolated loop that is not completely drained (because of the water injected by seal injection) to be connected to the active volume of the RCS. As a result, new measures must be implemented to ensure that the inventory in the isolated loop, when connected to the active volume, would not result in preconditions for an accident related to the startup of an inactive RCS loop. The licensee proposed changes to the TS to address these issues.

To ensure that the inventory in the isolated loop is sufficiently borated to maintain the required shutdown margin, the licensee proposed changes to TS 3.17.5 that would require: (1) the isolated loop be drained, and that it be verified as drained within 2 hours prior to initiating seal injection; (2) the boron concentration of the seal injection source be greater than or equal to the shutdown margin requirements of TS 1.0.C.2 or TS 3.10.A.9 as applicable, and when using the volume control tank (VCT) as the seal injection source, the verification of the concentration 1 hour prior to injection and every hour after during the backfill evolution; and (3) the boron concentration in the isolated loop be greater than or equal to the concentration requirements of TS 1.0.C.2 or TS 3.10.A.9 as applicable prior to fully opening the loop stop valves, and when using the VCT as the seal injection source, the verification of the appropriate boron concentration within 1 hour prior to fully opening the loop stop valves. TS 3.10.A.9 includes the boron concentration requirements for refueling shutdown. TS 1.0.C.2 includes the shutdown margin requirements, and indirectly boron concentration requirements, for cold shutdown.

The staff has reviewed the licensee's proposed changes. The additions to TS 3.17.5.a.1 ensure that the isolated loop is drained prior to initiating seal injection and that verification is required that the loop is drained within 2 hours prior to initiating seal injection. The staff finds that these additions are appropriate and sufficient to ensure that seal injection is not being

added to existing inventory, which could potentially be at a lower boron concentration. The 2 hours allowed between the verification and initiation of seal injection is consistent with the period of time currently allowed between the same verification and the opening of the loop stop valves for backfilling the loop using the non-vacuum-assisted backfill technique. Because verification that the isolated loop is drained serves the same purpose for the non-vacuum-assisted backfill technique as for the vacuum-assisted technique, use of the same allowable time is appropriate and acceptable.

The proposed changes to TS 3.17.5.a.2 and TS 3.17.5.c.2 require the boron concentration of the seal injection source to be greater than or equal to the shutdown margin requirements. Also, the proposed changes to TS 3.17.5.a.2 and TS 3.17.5.d.1 require initial (within 1 hour prior to seal injection) and periodic (once every hour after initiating seal injection) verification that the boron concentration of the source for seal injection (when the volume control tank is used) to be greater than or equal to the boron concentration requirements for shutdown margin. These proposed changes are appropriate because they are sufficient to ensure that the boron concentration of the seal injection used in the backfill process is consistent with the boron concentration requirements for maintaining shutdown margin. The licensee's proposal for boron concentration verification (TS 3.17.5.a.2 and TS 3.17.5.d.1) is applicable only to the path of blended makeup (the volume control tank). This proposal is appropriate because the boron concentration of the other potential sources, namely the reactor cavity and the refueling water storage tank, are controlled by other TS, which preclude the possibility of these sources being at an inadequate boron concentration.

The licensee proposed that verification of the boron concentrations per TS 3.17.5.a.2 be performed initially within 1 hour prior to initiating seal injection and periodically once every hour after initiating seal injection in accordance with TS 3.17.5.a.2. The licensee also proposed a change to TS 3.17.4.b.1 and TS 3.17.4.c.3 to decrease the time allowed in those TS for verification of the boron concentration from 2 hours to 1 hour prior to opening the hot and cold leg stop valves. The licensee stated that 1 hour provides adequate time for completing the sampling, analysis, and opening of the loop stop valves; and provides consistency between the two requirements. The licensee provided an estimate of representative times required for completion of the actions. The licensee estimated that it would take 15-20 minutes for getting the sample, 15-20 minutes for analyzing the sample, and 10-15 minutes for opening the loop stop valves. The licensee further stated that the proposed 1 hour provides sufficient time for unanticipated delays while providing adequate assurance that the boron concentration of the isolated loop or blended makeup is greater than the required concentration. The staff has reviewed the licensee's justification for the proposed frequency for TS 3.17.5.a.2 and for the change to time in TS 3.17.4.b.1 and TS 3.17.4.c.3 and finds the proposals reasonable.

The licensee proposed changes to TS 3.17.5.d.1 that would require the backfilled loop's boron concentration to be greater than or equal to the boron concentration corresponding to the shutdown margin requirements. The changes would also require that the concentration be verified within 1 hour prior to fully opening the loop stop valves on the isolated loop if the Volume Control Tank was used as the source for RCP seal injection. The proposed time of 1 hour is the same, and serves the same purpose as, the 1 hour that was proposed for TS 3.17.4.b.1 and TS 3.17.4.c.3 (see previous paragraph). The staff finds the proposed time of 1 hour reasonable based on the discussion in the previous paragraph. With respect to the requirement itself, the proposed changes ensure that the inventory within the isolated loop, which will be allowed to become part of the active RCS inventory when the loop stop valves are

opened, is sufficiently borated so that shutdown margin requirements continue to be met. The staff finds that the proposed requirements sufficiently address this issue.

The licensee proposed to also apply the current requirements for: (1) operable source range instrumentation to provide secondary indication on any RCS makeup boron concentration discrepancy, and (2) a minimum RCS volume to ensure that the decay heat removal capability is not challenged by the vacuum-assisted backfill technique. Furthermore, the licensee's analyses related to the temperature effect on reactivity are applied to the vacuum-assisted backfill technique to address any potential temperature difference between the isolated loop and the active RCS volume. As set forth below, the staff has reviewed the licensee's proposal with respect to these items and finds it acceptable.

The requirement for operable source range instrumentation provides secondary indication on any RCS makeup boron concentration discrepancy. This method has previously been accepted for use for this purpose as evidenced by the current TS for the non-vacuum-assisted technique. This method is also applicable and appropriate for use in the vacuum-assisted technique. The requirement for a minimum RCS volume proposed by the licensee is the same as that used in the non-vacuum-assisted case. The non-vacuum-assisted case is more bounding with respect to the RCS volume requirement because the drained volume to be filled is greater in that case. The inventory added by seal injection in the vacuum-assisted case, although expected to be small, could only serve to aid in preventing a loss of decay heat removal capability. Finally, the licensee's analyses for the temperature effect on reactivity were performed in a manner which bounds the vacuum-assisted case and are, therefore, also acceptable for addressing this issue.

2.2 Other Changes

The licensee proposed a change to the wording of Limiting Conditions for Operation (LCOs) 3.17.4.b.1 and 3.17.4.c.3 to reference TS 1.0.C.2 or TS 3.10.A.9, as applicable, for the shutdown margin requirements instead of requiring that the isolated loop be at a boron concentration greater than or equal to that of the operating loops. The proposed revisions are less restrictive than the current TS in that they would effectively allow the licensee to maintain the isolated loop at a boron concentration less than the remainder of the RCS. However, the licensee's proposed changes would still require that the isolated loop be sufficiently borated to maintain the required shutdown margin. The purpose of the requirements in LCOs 3.17.4.b.1 and 3.17.4.c.3 is to ensure that the isolated loop is sufficiently borated so that the required shutdown margin is maintained. The licensee's proposed changes continue to do this; therefore, the licensee's proposal is acceptable.

The licensee's submittal included several other changes that are not specifically discussed in this SE. These revisions were reviewed and determined to be of an editorial nature (i.e., they did not modify the technical requirements or intent of the associated TS). Therefore, these changes are also acceptable.

In summary, the staff has reviewed the licensee's proposed TS modifications to allow implementation of the vacuum-assisted backfill technique. Based on the discussion in Section 2.0, the staff finds that the changes are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comment.

4.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration, and there has been no public comment on such finding (66 FR 15932). Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

5.0 CONCLUSION

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

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