Nuclear Operating Company

South Texas Project Electric Generating Station P.O Box 289 Wadsworth, Texas 77483

August 21, 2002
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STI: 31470189

U. S. Nuclear Regulatory Commission
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South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Proposed Changes to Technical Specifications 3/4.4.1.4.2 and 3/4.9.1

STP Nuclear Operating Company (STPNOC) proposes to revise Technical Specifications 4.4.1.4.2.2 and 4.9.1.3 to delete the specific reference to the valves required to be secured to isolate potential uncontrolled boron dilution flow paths in MODE 5 with the loops not filled and in MODE 6. STPNOC proposes to replace the existing TS surveillance requirements with a new TS requirement modeled after TS 3.9.2 in the Westinghouse Improved Technical Specifications (NUREG-1431). The NUREG TS requires the flow path to be secured, but does not prescribe which valves must be used to isolate the flow path. The proposed change does not change any design basis or technical requirements and provides the same level of safety as the current Technical Specification.

STPNOC requests approval of the proposed amendment by February 1, 2003 to allow implementation in the Unit 1 refueling outage scheduled for March 2003. Once approved, the amendment shall be implemented within 30 days.

A001

The STPNOC Plant Operations Review Committee and Nuclear Safety Review Board have reviewed and approved the proposed change to the Technical Specifications.

In accordance with 10 CFR 50.91(b), STPNOC is notifying the State of Texas of this request for license amendment by providing a copy of this letter and its attachments.

If there are any questions regarding the proposed amendment, please contact Mr. A. W. Harrison at (361) 972-7298 or me at (361) 972-7902.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on August 21, 2002.
Date

T. J. Jordan
Vice President
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awh/

Attachments:
1. Description of Changes and Safety Evaluation
2. Marked-up Technical Specification Pages
3. Revised Technical Specification Pages

cc:
(paper copy)

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Description of Changes and Safety Evaluation

1.0 DESCRIPTION

STP Nuclear Operating Company (STPNOC) proposes to revise Technical Specifications (TS) 3/4.4.1.4.2. and 3/4.9.1 to delete the specific reference in the Surveillance Requirements (SRs) to the valves required to be secured to isolate potential uncontrolled boron dilution flow paths in MODE 5 with the loops not filled and in MODE 6. STPNOC proposes to replace the existing TS surveillance requirements with new TS requirements modeled after TS 3.9.2 in the Westinghouse Improved Technical Specifications (NUREG-1431). The NUREG TS requires the flow path to be secured, but does not prescribe which valves must be used to isolate the flow path. The proposed change does not change any design basis or technical requirements and provides the same level of safety as the current Technical Specification.

2.0 PROPOSED CHANGE

The specific changes are described in the table below. The proposed new wording for the subject TS does not specifically identify which valves must be used to isolate the potential boron dilution pathways; however, there is no change in the requirement that the pathways be isolated. The proposed change is consistent with the provisions of the Improved Standard Technical Specifications for Westinghouse plants (NUREG-1431). The details of how the pathways can be isolated will be provided in the Bases. The draft text proposed for the Bases is also provided in the table. Figure 1 (STP UFSAR Fig. 9.3.4-3) depicts the potential dilution flow paths and the alternate isolation points.

Affected TS	Current Requirement	Proposed Requirement	Comments
SR 4.4.1.4.2.2	Valves FCV-110B, FCV-111B, CV0201A, and CV0221 shall be verified closed and secured in position by mechanical stops or by removal of air or electrical power at least once per 31 days.	TS 3/4.4.1.4.2 will be revised to make the existing LCO for RHR LCO a. and add a specific LCO b. for securing the isolation valves: Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position. A new ACTION c. will be added to complement LCO b.: c. With a valve or mechanical joint used to isolate unborated water sources not secured in the closed position, immediately suspend all operations that would cause introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1 and initiate action to secure the valve(s) or joint(s) in the closed position and within 4 hours verify boron concentration is within limits specified in LCO 3.1.1.2. The required action to verify the boron concentration within limits must be completed whenever ACTION c is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint. SR 4.4.1.4.2.2 will be revised to read: Each valve or mechanical joint used to isolate unborated water sources shall be verified closed and secured in position at least once per 31 days.	The proposed change involves no technical change in the requirement for the dilution flow paths to be secured and maintains the same level of safety. Creating a LCO clarifies the actions required with a boron dilution flow path unsecured. The TS requirements are consistent with the STP design and licensing basis and modeled after ITS 3.9.2. The STP proposed wording includes mechanical joint because one alternative for isolation includes installing a blind flange.

Affected TS	Current Requirement	Proposed Requirement	Comments
SR 4.9.1.3	Valves FCV-110B, FCV-111B, CV0201A, and CV0221 shall be verified closed and secured in position by mechanical stops or by removal of air or electrical power at least once per 31 days.	TS 3/4.9.1 will be revised similar to TS 3/4.4.1.4.2 to add a new LCO c: Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position. The existing ACTION will be revised to be ACTION a. and clarified that it corresponds to LCO a. and b. A new ACTION b. will be added to correspond to new LCO c.: b. With a valve or mechanical joint used to isolate an unborated water source not secured in the closed position, immediately suspend CORE ALTERATIONS and initiate action to secure the valve(s) or mechanical joint(s) in the closed position and within 4 hours verify boron concentration is within limit. The required action to verify the boron concentration within limits must be completed whenever ACTION b. is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint. SR 4.9.1.3 will be revised to read: Each valve or mechanical used to isolate unborated water sources shall be verified closed and secured in position at least once per 31 days.	The proposed change involves no technical change in the requirement for the dilution flow paths to be secured and maintains the same level of safety. The creation of the LCO clarifies the actions required by the Technical Specification and the actions are consistent with the STP design and licensing basis and match the requirements of NUREG-1431.

Affected TS	Current Requirement	Proposed Requirement	Comments
TS Bases	No Bases are provided for isolation of the boron dilution flow paths for SR 4.4.1.4.2.2. The Bases for 3/4.9.1.3 reads "The locking closed of the required valves during refueling operations precludes the possibility of uncontrolled boron dilution of the filled portion of the RCS. This action prevents flow to the RCS of unborated water by closing flow paths from sources of unborated water."	The Bases for both affected TS will be revised as shown in the attached TS markups.	The proposed Bases statements provide the appropriate level of detail and clarification of the TS requirements and impose no additional requirements that should be included in the TS.

3.0 BACKGROUND

A uncontrolled boron dilution event is outside the STP design basis in MODE 5 with the loops not filled and in MODE 6 based on the requirement to maintain the potential dilution flow paths isolated. The pertinent UFSAR Ch. 15.4.6.2 paragraphs are excerpted below. STPNOC would make appropriate changes to the UFSAR to allow for alternate means of isolating the dilution flow paths (see Technical Analysis in Sec. 4).

> Dilution During Refueling
> An uncontrolled boron dilution accident cannot occur during refueling. This accident is prevented by administrative controls which isolate the RCS from the potential source of unborated water.
> Valves FCV-110B, FCV-111B, CV0201A, and CV0221 in the CVCS will be locked closed or isolated by removal of instrument air or electrical power during refueling operations. These valves will block the flow paths which could allow unborated water to reach the RCS. Any makeup which is required during refueling will be borated water supplied from the refueling water storage tank (RWST) or the Boric Acid Tank (BAT) using the Centrifugal Charging Pumps and/or the Low Head Safety Injection (LHSI) Pumps.
>
> Dilution During Cold Shutdown
> Conditions at cold shutdown require the reactor to have available at least 1.3 percent Δk shutdown margin. The following conditions are assumed for an uncontrolled boron dilution during cold shutdown.
> 1. Dilution flow (125 gal/min) is assumed as the best estimate maximum flow from the RMWS assuming that multiple simultaneous failures of control valves and alarms have an extremely low potential for occurrence.
> 2. A minimum water volume (5,438 ft^3 for Model Delta 94 SGs and 5,186 ft^3 for Model E SGs) in the RCS is used. This is a conservative estimate of the active volume of the RCS with the reactor coolant loops and the pressurizer filled while on one train of residual heat removal (RHR), and 10% of the steam generator tubes plugged.
>
> When the water level is drained down from a filled and vented condition in cold shutdown, an uncontrolled boron dilution accident is prevented by administrative controls which isolate the RCS from the potential source of unborated water. The valves specified in the previous section will be required to be locked out in this cold shutdown condition.

To complement the UFSAR, the TS SR 4.4.1.4.2.2 and SR 4.9.1.3 specifically require that FV-110B, FV-111B, CV-0201A, and CV-0221 be verified closed and secured by mechanical stops or removal of air or electric power.

The subject isolation valves are in service during power operations and on-line maintenance is not practical. During outages, the valves must be secured so normal maintenance cannot be performed except in a very narrow time window when all fuel is removed from the vessel.

Because there are alternative means of isolating the dilution pathways, the current TS are unnecessarily restrictive. The same level of safety can be assured by requiring the dilution flow paths to be isolated, but without prescribing the isolation devices to be used or prescribing the means of securing the device in the closed position.

4.0 TECHNICAL ANALYSIS

Figure 1 depicts the potential boron dilution flow paths. It can be seen that there are alternative ways to isolate the dilution flow paths, as shown below. (This list of alternates may not be complete, but illustrates the options available.)

a. Close and secure CV-0198 (isolates all flow)
   OR
b. Secure the pathway through chemical addition line by securing CV-0201A or CV-0214, or CV-0197, and
c. Secure the pathway through the emergency boration line by securing CV-0203, or FCV-0111A or CV-0221, and
d. Secure the pathway to charging suction header by securing CV-0203 or FCV-0111A, or installing a blank flange at FE-0111 or securing FCV-0110B or CV-0211, and
e. Secure the pathway to the VCT inlet by securing CV-0203 or FCV-0111A or installing a blank flange at FE-0111 or securing FCV-0111B or CV-0185A and CV-0185B.

The method of securing the valves in the closed position (remove power or air, mechanical stop, etc.) is not expected to change from that originally required by the TS; however the method does not need to be prescribed in the Technical Specifications.

If a dilution isolation flow path is found not to be secured the proposed TS require the operators to initiate action immediately to secure the path. If the plant is in MODE 5 with loops not filled, all operations must be suspended that could cause an introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1. If the plant is in MODE 6, CORE ALTERATIONS must be suspended. In addition, within 4 hours the boron concentration must be confirmed to be within required limits. These required actions may be entered separately for each isolation device (valve or mechanical joint) found not to be secured. These actions require the operator to remedy the unsecured path, suspend actions that could exacerbate the condition, and confirm that the condition is resolved. These are new requirements that were not previously specified in the STP TS and provide the operator with clear direction for actions to be taken with regard to unsecured dilution flow paths.

The proposed changes to the Technical Specifications make no significant changes to the technical requirements. The alternate points for isolating the potential boron dilution pathways are as effective as those currently prescribed in the TS. STPNOC considers this proposed change to be largely administrative because it provides alternate means to accomplish the same outcome. Allowing alternate isolation locations requires no different analyses and its implementation is achieved by changing procedures.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

STPNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below.

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

Response: No.

There is no technical change in the requirements imposed by the Technical Specifications. The proposed changes to replace the TS reference to the specific valves to be used to isolate boron dilution flow paths with new Technical Specification requirements to assure the flow paths are secured provides the same level of assurance that the boron dilution event will be precluded.

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

Response: No.

The proposed change allows alternate, equally effective, locations where the potential boron dilution flow paths can be isolated to preclude an uncontrolled boron dilution event in MODE 5 with the loops not filled and in MODE 6. Consequently, the possibility of the dilution event is unchanged. The proposed change does not otherwise alter how the plant is operated or change its design basis so that the possibility of a new accident is not created.

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

Response: No.

The proposed changes to replace the TS reference to the specific valves to be used to isolate boron dilution flow paths with new Technical Specification

requirements to assure the flow paths are secured provides the same level of assurance that the boron dilution event will be precluded.

Conclusion

Based upon the analysis provided herein, the proposed amendments do not involve a significant hazards consideration.

5.2 Applicable Regulatory Requirements/Criteria

Design for potential boron dilution events is reviewed in accordance with NUREG-0800 Section 15.4.6. The applicable General Design Criteria cited in the NUREG are:

A. General Design Criterion 10, as it relates to the reactor coolant system being designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during normal operations including anticipated operational occurrences.
B. General Design Criterion 15, as it relates to the reactor coolant system and its associated auxiliaries being designed with appropriate margin to assure that the pressure boundary will not be breached during normal operations including anticipated operational occurrences.
C. General Design Criterion 26, as it relates to the reliable control of reactivity changes to assure that specified acceptable fuel design limits are not exceeded, including anticipated operational occurrences. This is accomplished by assuring that appropriate margin for malfunctions, such as stuck rods, are accounted for.

In addition, The RCS boron concentration satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

Because there is no change in the design basis or level of protection provided, the changes proposed by STPNOC will have no effect on the continued compliance with the applicable regulatory criteria.

6.0 ENVIRONMENTAL CONSIDERATION

10 CFR 51.22(b) specifies the criteria for categorical exclusion from the requirements for a specific environmental assessment per 10 CFR 51.21. This amendment request meets the criteria specified in 10 CFR 51.22(c)(9). The specific criteria contained in this section are discussed below.

(i) the amendment involves no significant hazards consideration

As demonstrated in the No Significant Hazards Consideration Determination, the requested license amendment does not involve any 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 requested license amendment involves no change to the facility and does not involve any change in the manner of operation of any plant systems involving the generation, collection or processing of radioactive materials or other types of effluents. Therefore, no increase in the amounts of effluents or new types of effluents would be created.

(iii) there is no significant increase in individual or cumulative occupational radiation exposure

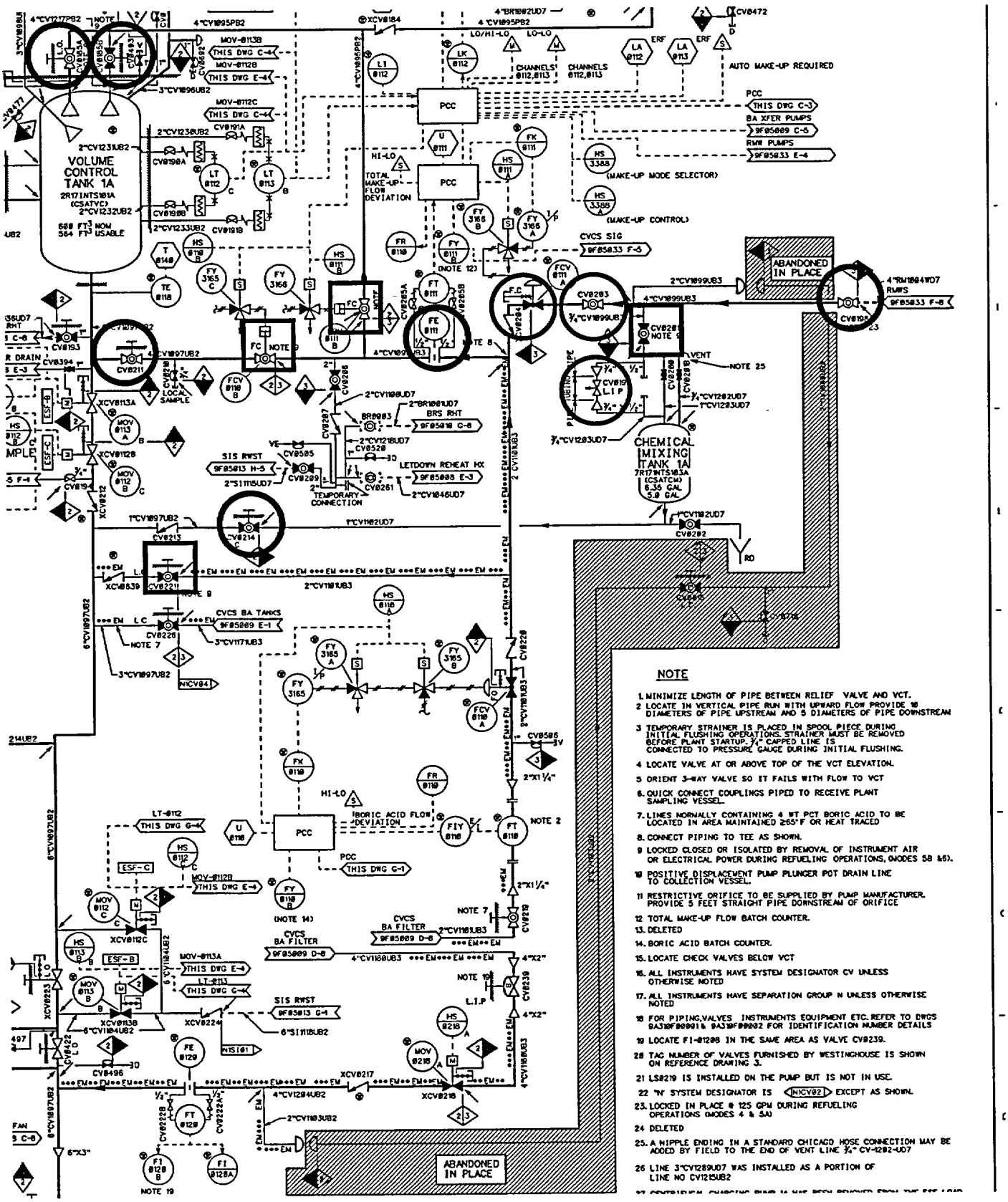
The requested license amendment involves no change to the facility and will not increase the radiation dose resulting from the operation of any plant system. Furthermore, implementation of this proposed change will not involve work activities that could contribute to occupational radiation exposure. Therefore, there will be no increase in individual or cumulative occupational radiation exposure associated with this proposed change.

Based on the above it is concluded that there will be no impact on the environment resulting from this change. The change meets the criteria specified in 10 CFR 51.22 for a categorical exclusion from the requirements of 10 CFR 51.21 relative to specific environmental assessment by the Commission.

7.0 REFERENCES

1. STP Updated Final Safety Analysis Report
2. NUREG-1431

Figure 1: Example Alternate Isolation Locations Alternate ○ Existing □



Marked-up Technical Specification Pages

REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2

a. At least two residual heat removal (RHR) loops shall be OPERABLE* and at least one RHR loop shall be in operation.**, **and**

b. **Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.

b. With no RHR loop in operation, suspend all operations that would cause introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1 and immediately initiate corrective action to return the required RHR loop to operation.

c. **With a valve or mechanical joint used to isolate unborated water sources not secured in the closed position, immediately suspend all operations that would cause introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1 and initiate action to secure the valve(s) or joint in the closed position and within 4 hours verify boron concentration is within limits specified in LCO 3.1.1.2. The required action to verify the boron concentration within limits must be completed whenever ACTION c is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint.**

SURVEILLANCE REQUIREMENTS

4.4.1.4.2.1 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

4.4.1.4.2.2 ~~Valves FCV-110B, FCV-111B, CV0201A, and CV0221~~**Each valve or mechanical joint used to isolate unborated water sources** shall be verified closed and secured in position ~~by mechanical stops or removal of air or electrical power~~ at least once per 31 days.

*Two RHR loops may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

**The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

3/4.9 REFUELING OPERATIONS

3/4 9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 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; either:

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

b. A boron concentration of greater than or equal to 2800 ppm, **and**

c. **Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position.**

APPLICABILITY: MODE 6.*

ACTION:

a. With the requirements of ~~the above specification~~ **LCO a. or b.** not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 30 gpm of a solution containing greater than or-equal to 7000 ppm boron or its equivalent until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 2800 ppm, whichever is the more restrictive.

b. **With a valve or mechanical joint used to isolate an unborated water source not secured in the closed position, immediately suspend CORE ALTERATIONS and initiate action to secure the valve(s) or mechanical joint in the closed position and within 4 hours verify boron concentration is within limit. The required action to verify the boron concentration within limits must be completed whenever ACTION b. is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint.**

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 in excess of 3 feet from its fully inserted position within the reactor vessel.

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.

4.9.1.3. ~~Valves FCV-110B, FCV-111B, CV0201A, and CV0221~~**Each valve or mechanical joint used to isolate unborated water sources** shall be verified closed and secured in position ~~by mechanical stops or removal of air or electrical power~~ at least once per 31 days.

*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

Bases Changes (for information - changes will be provided after approval)

The following Bases information will be added for TS 3/4.4.1.4.2:

BACKGROUND

During MODE 5 operations with the loops not filled, all isolation valves for reactor makeup water sources containing unborated water that are connected to the Reactor Coolant System (RCS) must be closed to prevent unplanned boron dilution of the reactor coolant. The isolation valves must be secured in the closed position.

The Chemical and Volume Control System is capable of supplying borated and unborated water to the RCS through various flow paths. Since a positive reactivity addition made by reducing the boron concentration is inappropriate during MODE 5 with the loops not filled, isolation of all unborated water sources prevents an unplanned boron dilution.

APPLICABLE SAFETY ANALYSES

The possibility of an inadvertent boron dilution event (Ref. 1) occurring during MODE 5 with the loops not filled is precluded by adherence to this LCO, which requires that potential dilution sources be isolated. Closing the required valves or mechanical joints during refueling operations prevents the flow of unborated water to the filled portion of the RCS. The valves and mechanical joints are used to isolate unborated water sources. These devices have the potential to indirectly allow dilution of the RCS boron concentration in MODE 5. By isolating unborated water sources, a safety analysis for an uncontrolled boron dilution accident in accordance with the Standard Review Plan (Ref. 2) is not required for MODE 5 with the loops not filled.

The RCS boron concentration satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that flow paths to the RCS from unborated water sources be isolated to prevent unplanned boron dilution during MODE 5 with the loops not filled and thus avoid a reduction in SDM.

APPLICABILITY

In MODE 5 with the loops not filled, this LCO is applicable to prevent an inadvertent boron dilution event by ensuring isolation of all sources of unborated water to the RCS.

ACTIONS

The ACTIONS section allows separate ACTION entry for each unsecured unborated water source isolation valve or mechanical joint used for isolation.

Continuation of reactivity control activities is contingent upon maintaining the unit in compliance with this LCO. With any valve or mechanical joint used to isolate unborated water sources not secured in the closed position, all operations involving that could reduce the boron concentration of the RCS below the SDM must be suspended immediately. The Completion Time of "immediately" for performance of the required action shall not preclude completion of movement of a component to a safe position.

The required action to confirm the boron concentration is within limit is required to be completed whenever ACTION c. is entered.

Preventing inadvertent dilution of the reactor coolant boron concentration is dependent on maintaining the unborated water isolation devices secured closed. Securing the valves or mechanical joints in the closed position ensures that the devices cannot be inadvertently opened. The Completion Time of "immediately" requires an operator to initiate actions to close an open valve or mechanical joint and secure the isolation device in the closed position immediately. Once actions are initiated, they must be continued until the devices are secured in the closed position.

Due to the potential of having diluted the boron concentration of the reactor coolant, verification of boron concentration must be performed whenever ACTION c is entered to demonstrate that the required boron concentration exists. The Completion Time of 4 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration.

SURVEILLANCE REQUIREMENTS

SR 4.4.1.4.2.2

These valves or mechanical joints are to be secured closed to isolate possible dilution paths. The likelihood of a significant reduction in the boron concentration during MODE 5 with the loops not filled is remote due to the fact that all unborated water sources are isolated, precluding a dilution. This Surveillance demonstrates that the devices are closed through a system walkdown. The 31 day Frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that the device opening is an unlikely possibility.

REFERENCES
1. UFSAR, Section 15.4.6
2. NUREG-0800, Section 15.4.6.

The following information will be added to the Bases for TS 3/4.9.1:

BACKGROUND

During MODE 6 operations, all isolation valves for reactor makeup water sources containing unborated water that are connected to the Reactor Coolant System (RCS) must be closed to prevent unplanned boron dilution of the reactor coolant. The isolation valves must be secured in the closed position.

The Chemical and Volume Control System is capable of supplying borated and unborated water to the RCS through various flow paths. Since a positive reactivity addition made by reducing the boron concentration is inappropriate during MODE 6, isolation of all unborated water sources prevents an unplanned boron dilution.

APPLICABLE SAFETY ANALYSES

The possibility of an inadvertent boron dilution event (Ref. 1) occurring during MODE 6 is precluded by adherence to this LCO, which requires that potential dilution sources be isolated. Closing the required valves or mechanical joints during refueling operations prevents the flow of unborated water to the filled portion of the RCS. The valves and mechanical joints are used to isolate unborated water sources. These devices have the potential to indirectly allow dilution of the RCS boron concentration in MODE 6. By isolating unborated water sources, a safety analysis for an uncontrolled boron dilution accident in accordance with the Standard Review Plan (Ref. 2) is not required for MODE 6.

The RCS boron concentration satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that flow paths to the RCS from unborated water sources be isolated to prevent unplanned boron dilution during MODE 6 and thus avoid a reduction in required boron concentration.

APPLICABILITY

In MODE 6, this LCO is applicable to prevent an inadvertent boron dilution event by ensuring isolation of all sources of unborated water to the RCS.

ACTIONS

The ACTIONS are modified to allow separate ACTION entry for each unborated water source isolation valve.

Continuation of CORE ALTERATIONS is contingent upon maintaining the unit in compliance with this LCO. With any valve or mechanical joint required to isolate unborated water sources

not secured in the closed position, all operations involving CORE ALTERATIONS must be suspended immediately. The Completion Time of "immediately" for performance the required action shall not preclude completion of movement of a component to a safe position.

ACTION b. includes a requirement that the verification that boron concentration is within limit be completed whenever ACTION b. is entered.

Preventing inadvertent dilution of the reactor coolant boron concentration is dependent on maintaining the unborated water isolation devices secured closed. Securing the valves or mechanical joints in the closed position ensures that the devices cannot be inadvertently opened. The Completion Time of "immediately" requires an operator to initiate actions to close an open valve or mechanical joint and secure the isolation device in the closed position immediately. Once actions are initiated, they must be continued until the devices are secured in the closed position.

Due to the potential of having diluted the boron concentration of the reactor coolant, verification of boron concentration per SR 4.9.1.2 must be performed whenever ACTION b. is entered to demonstrate that the required boron concentration exists. The Completion Time of 4 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration.

SURVEILLANCE REQUIREMENTS

SR 4.9.1.3

These valves or mechanical joints are to be secured closed to isolate possible dilution paths. The likelihood of a significant reduction in the boron concentration during MODE 6 operations is remote due to the large mass of borated water in the refueling cavity and the fact that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked every 72 hours during MODE 6 under 4.9.1.2. This Surveillance demonstrates that the devices are closed through a system walkdown. The 31 day Frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that the valve opening is an unlikely possibility.

REFERENCES
1. UFSAR, Section 15.4.6.
2. NUREG-0800, Section 15.4.6.

Revised Technical Specification Pages

REACTOR COOLANT SYSTEM

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2

a. At least two residual heat removal (RHR) loops shall be OPERABLE* and at least one RHR loop shall be in operation.**, and

b. Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position.

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.

b. With no RHR loop in operation, suspend all operations that would cause introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1 and immediately initiate corrective action to return the required RHR loop to operation.

c. With a valve or mechanical joint used to isolate unborated water sources not secured in the closed position, immediately suspend all operations that would cause introduction into the RCS of coolant with boron concentration less than required to meet SHUTDOWN MARGIN of LCO 3.1.1 and initiate action to secure the valve(s) or joint in the closed position and within 4 hours verify boron concentration is within limits specified in LCO 3.1.1.2. The required action to verify the boron concentration within limits must be completed whenever ACTION c is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2.1 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

4.4.1.4.2.2 Each valve or mechanical joint used to isolate unborated water sources shall be verified closed and secured in position at least once per 31 days.

*Two RHR loops may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

**The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 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; either:

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

b. A boron concentration of greater than or equal to 2800 ppm, and

c. Each valve or mechanical joint used to isolate unborated water sources shall be secured in the closed position.

APPLICABILITY: MODE 6.*

ACTION:

a. With the requirements of LCO a. or b. not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 30 gpm of a solution containing greater than or-equal to 7000 ppm boron or its equivalent until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 2800 ppm, whichever is the more restrictive.

b. With a valve or mechanical joint used to isolate an unborated water source not secured in the closed position, immediately suspend CORE ALTERATIONS and initiate action to secure the valve(s) or mechanical joint in the closed position and within 4 hours verify boron concentration is within limit. The required action to verify the boron concentration within limits must be completed whenever ACTION b. is entered. A separate ACTION entry is allowed for each unsecured valve or mechanical joint.

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 in excess of 3 feet from its fully inserted position within the reactor vessel.

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.

4.9.1.3. Each valve or mechanical joint used to isolate unborated water sources shall be verified closed and secured in position at least once per 31 days.

*The reactor shall be maintained in MODE 6 whenever fuel is in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.