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July 29, 2003

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
License Amendment Request: Improvement to the Definition of Operations
Involving Positive Reactivity Changes

REFERENCES:

- (a) Letter from P. E. Katz (CCNPP) to Document Control Desk (NRC), dated April 17, 2003, License Amendment Request: Improvement to the Definition of Operations Involving Positive Reactivity Changes
- (b) Industry/TSTF Standard Technical Specification Change Traveler TSTF-286, Revision 2, Define "Operations Involving Positive Reactivity Changes"

Pursuant to 10 CFR 50.90, Calvert Cliffs Nuclear Power Plant (Calvert Cliffs) hereby requests an amendment to Renewed Operating License Nos. DPR-53 and DPR-69 to incorporate the changes described in the attachments to this letter into the Technical Specifications for Calvert Cliffs Unit Nos. 1 and 2.

Recent discussions with the Nuclear Regulatory Commission (NRC) staff have identified clarifications required in the description of proposed changes in Reference (a). This letter provides that clarification and augments Reference (a). The items discussed in this letter and the Technical Specification marked-up pages have been reviewed against the Determination of Significant Hazards submitted in Reference (a). We have determined that the Determination of Significant Hazards still remains valid and has not been affected by this letter.

The proposed amendment will revise Technical Specification actions requiring suspension of operations involving positive reactivity addition and revise various notes precluding reduction in boron concentration. The proposed revisions will allow only those positive reactivity additions that do not adversely affect shutdown margin (SDM) or refueling boron concentration. Discussion and analysis of the proposed changes is provided in Attachment (1), the markup of current Technical Specification pages is provided in Attachment (2), and the final Technical Specification pages are provided in Attachment (3). Changes to the Technical Specification Bases consistent with the NRC approval of this request will be made once the request is approved.

A035

The changes proposed in this letter are similar to those documented in Industry Technical Specification Task Force (TSTF)-286, Revision 2, "Define 'Operations Involving Positive Reactivity Additions' ", which was approved by the NRC. Calvert Cliffs has reviewed TSTF-286, Revision 2 and concluded that it is applicable to Calvert Cliffs Units 1 and 2. Differences between TSTF-286, Revision 2 and the proposed Technical Specification changes, are noted and discussed in Attachment (1).

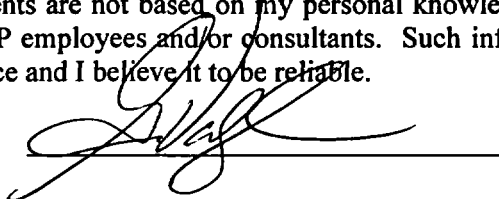
Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



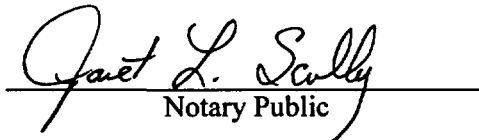
STATE OF MARYLAND :
: TO WIT:
COUNTY OF CALVERT :

I, George Vanderheyden, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP), and that I am duly authorized to execute and file this License Amendment Request on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.



Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 29th day of July, 2003.

WITNESS my Hand and Notarial Seal:


Notary Public

My Commission Expires:

March 25, 2007
Date

GV/EMT/bjd

Attachments: (1) Discussion and Analysis of the Proposed Changes
(2) Technical Specification Marked-up Pages
(3) Final Technical Specification Pages

cc: J. Petro, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
G. S. Vissing, NRC

H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (1)

**DISCUSSION AND ANALYSIS
OF THE PROPOSED CHANGES**

ATTACHMENT (1)

DISCUSSION AND ANALYSIS OF THE PROPOSED CHANGES

BACKGROUND

This proposed amendment revises several of the Required Actions in the Calvert Cliffs Nuclear Power Plant (CCNPP) Technical Specifications that require the suspension of operations involving positive reactivity additions or suspension of operations involving Reactor Coolant System (RCS) boron concentration reductions. In addition, the proposed amendment revises several Limiting Condition for Operation (LCO) notes that preclude reductions in RCS boron concentration. This proposed amendment revises these Required Actions and LCO notes to allow small, controlled, safe insertions of positive reactivity, but limits the introduction of positive reactivity such that compliance with the required shutdown margin (SDM), or refueling boron concentration limits will still be satisfied.

This proposed change to Calvert Cliffs Technical Specifications incorporates TSTF-286, Revision 2 (Reference 1). The TSTF is applicable to Calvert Cliffs. During conditions in which the actions affected by the proposed changes may be required, various unit operations must be maintained and RCS temperature must be controlled. These activities may make it necessary to add cooler water to the RCS (a positive reactivity change in most cases) or may involve inventory makeup from sources that are at a boron concentration less than that in the RCS. The proposed change provides the flexibility necessary for continued safe reactor operations, while limiting any potential for excess positive reactivity addition.

For example, operational considerations may make it necessary or prudent to use a different shutdown cooling loop from the one in operation. With the proposed changes, if the newly selected shutdown cooling loop is sampled and the boron concentration is slightly lower than that of the RCS, but sufficiently higher than the SDM and refueling boron concentration limits continue to be met, the switch to a different loop would be acceptable. Alternatively, if the shutdown cooling loop is at a lower or higher temperature than the RCS average temperature, but the reactivity effects are small enough to assure that the SDM and refueling boron concentration limits will continue to be met, the change to an alternate loop may be performed.

Another example of the type of activity that will be acceptable when the proposed changes are in effect is the addition of inventory to the RCS from the refueling water tank (RWT) during a refueling outage. Boron concentration in the RWT is controlled by Technical Specifications between 2300 ppm and 2700 ppm. The RWT boron concentrations are cycle-specific and subject to change based on core design. Provided that the RWT boron concentration is sufficiently high to assure SDM and refueling boron concentration limits will continue to be met, an alternate supply of makeup to the RCS will be available from the RWT. These activities should not be precluded as long as the required SDM or refueling boron concentration is maintained.

SAFETY EVALUATION

Shutdown margin is a core design condition that can be ensured during operation through control element assembly (CEA) positioning (control and shutdown groups) and through adjustment of the soluble boron concentration. In Modes 1 through 4, the minimum required SDM is assumed as an initial condition in safety analyses. This assumption ensures that specified acceptable fuel design limits are not exceeded for normal operation and anticipated operational occurrences, assuming that the highest worth CEA remains fully withdrawn (and thus unavailable) following a reactor scram. In Modes 5 and 6, the reactivity condition of the core is consistent with the initial conditions assumed for the boron dilution accident analysis. The required boron concentration, in Mode 6, ensures that the k_{eff} of the core will remain within the required value during refueling operations.

Shutdown margin requirements provide sufficient reactivity margin to ensure that acceptable fuel design limits will not be exceeded for normal shutdown conditions and anticipated operational occurrences. As

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such, the SDM defines how much negative reactivity results from insertion or trip of all CEAs, assuming the CEA of highest reactivity worth is fully withdrawn. In Modes 1 and 2 when critical, SDM is ensured by complying with Technical Specification 3.1.5, "Shutdown Control Element Assembly (CEA) Insertion Limits," and Technical Specification 3.1.6, "Regulating Control Element Assembly (CEA) Insertion Limits."

In Mode 2 when subcritical and in Modes 3, 4, and 5, the SDM requirements provide enough negative reactivity to meet the assumptions of the safety analyses in the Updated Final Safety Analysis Report. In Modes 3 and 4, some rods may be withdrawn, which provides trippable rod worth in addition to preparing for reactor startup, but acceptable margin to criticality ($k_{eff} < 0.99$) is maintained. Small changes in reactivity occur as a result of temperature changes associated with RCS inventory management or RCS temperature control. At the beginning of core life a positive moderator temperature coefficient is allowed by Technical Specification 3.1.3, "Moderator Temperature Coefficient (MTC)."

In Mode 6, the shutdown reactivity requirements are given in Technical Specification 3.9.1. During Mode 6, the limit on the boron concentrations of the RCS, the spent fuel pool and the refueling cavity ensures that the reactor remains subcritical. Refueling boron concentration is the soluble boron concentration in the coolant having direct access to the reactor core during refueling. The soluble boron concentration, which offsets core reactivity, is measured by chemical analysis of a representative sample of the coolant. The refueling boron concentration limit is specified in the Core Operating Limits Report.

Two independent reactivity control systems are provided at Calvert Cliffs Units 1 and 2. Under cold conditions, one of these systems maintains the core subcritical by the use of movable control and shutdown CEAs. The other system uses the Chemical and Volume Control System (CVCS) that adjusts the soluble boric acid in the RCS. In Modes 1 and 2, the two independent reactivity control systems are used to compensate for the reactivity effects of the fuel and water temperature changes that accompany power level changes over the range from full load to no load. In addition, the CEAs together with the CVCS provide SDM during power operation and are capable of making the core subcritical rapidly enough to prevent exceeding acceptable fuel design limits, assuming that the CEA of highest reactivity worth remains fully withdrawn. In Modes 3, 4, and 5, soluble boron is used to compensate for reactivity changes caused by temperature and reactor poisons, such as xenon, to maintain the reactor subcritical under shutdown conditions. Some rods are withdrawn in Mode 3 to prepare for reactor startup. In Mode 6, the CVCS is used to control boron concentration to meet required limits.

The main steam line break and boron dilution accidents are the most limiting analyses that establish the SDM value for LCO 3.1.1 and the minimum boron concentration requirement of LCO 3.9.1. For main steam line break accidents, if LCO 3.1.1 is not met, there is a potential to exceed the departure from nucleate boiling ratio limit and the required actions of LCO 3.1.1 are necessary to restore compliance with the LCO. For the boron dilution accident, if LCO 3.1.1 or LCO 3.9.1 are not met, the minimum required time assumed for operator action to terminate dilution may no longer be sufficient and the required actions of LCO 3.1.1 or LCO 3.9.1 are necessary to restore compliance with the LCO.

The actions and notes that preclude positive reactivity additions and reduction in boron concentration were intended to ensure that under the specified plant conditions, further power increases or reductions in the margin to core criticality are precluded. The proposed change to modify existing notes and actions, allows the small reactivity effects that result from temperature or boron concentration fluctuations associated with RCS inventory management or temperature control to be performed provided the minimum SDM of LCO 3.1.1 or the minimum boron concentration of LCO 3.9.1 is maintained. The changes to notes and actions continue to provide assurance that the assumptions of the most limiting accident analyses are maintained. Therefore, necessary activities that involve additions to the RCS of

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cooler water (a positive reactivity effect in most cases) and that may involve makeup from borated sources of water that are at boron concentrations less than the RCS boron concentration should not be precluded as long as the required margin to criticality, the required SDM, or refueling boron concentration limits are not adversely affected.

DESCRIPTION OF PROPOSED CHANGES

Calvert Cliffs proposes to change the Technical Specification requirements applicable when required actions or other requirements direct the suspension of activities that involve a positive reactivity change. The associated Technical Specification Bases will be modified to clearly delineate which activities are acceptable when operating in a condition requiring suspension of activities that result in positive reactivity changes.

The proposed changes are consistent with approved Industry Technical Specification Task Force (TSTF) Technical Specification Traveler, TSTF-286, Revision 2 (Reference 1), Define Operations Involving Positive Reactivity Additions, with exceptions noted in the applicable descriptions of changes.

In Reference (2), the Nuclear Regulatory Commission (NRC) expressed a preference for a modification of TSTF-286, Revision 2 wording. The new wording incorporates the phrase "of coolant into the RCS" into several Technical Specification markups. As noted in the specific changes requested by this letter, we are using the NRC preferred wording.

Changes modified from TSTF-286, Revision 2:

1. Revised Required Action 3.3.12.A.1 to state, "Suspend all operations that involve positive reactivity additions that are not accounted for in the calculated SDM." Condition A is applicable in Modes 3, 4 and 5 with the reactor trip circuit breakers open or the control element assembly (CEA) drive system not capable of CEA withdrawal, when one or more required wide range neutron flux monitor channels are inoperable. When one or more channels are inoperable, the wide range neutron flux monitoring function cannot be reliably performed and the absence of reliable neutron flux indication makes it difficult to ensure SDM is maintained. Therefore, positive reactivity additions that are not accounted for in the calculated SDM will not be allowed so that, while the instrumentation is inoperable, SDM in the system will not be adversely affected. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

This change is a modification of TSTF-286, Revision 2 (LCO 3.3.13), which inserted a note stating "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM." We prefer to have this direction in the required action rather than a note. Required Action 3.3.12.A.1 will fulfill the same purpose as the note by requiring suspension of operations involving positive reactivity addition if the calculated SDM is adversely affected.

2. Revised LCO 3.4.5, Note 1.a to state, "No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and." This note is applicable in Mode 3 when all reactor coolant pumps are not in operation for \leq one hour per eight hour period and \leq two hours per eight hour period for low flow testing. In this condition, natural circulation is established. Positive reactivity additions that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

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Note 1.a will still restrict the conditions under which the reactor coolant pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 (LCO 3.4.5, Note a) in wording only and is in conformance with Reference (2).

3. Revised Required Action 3.4.5.C.1 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1." Condition C is applicable in Mode 3 when no RCS loop is operable or when no RCS loop is in operation. Positive reactivity additions that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.4.5.C.1 will continue to require suspension of operations involving positive reactivity additions if the SDM limit specified in LCO 3.1.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

4. Revised LCO 3.4.6, Note 1.a to state, "No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and". This note is applicable in Mode 4 when all reactor coolant pumps and shutdown cooling (SDC) pumps are not in operation for \leq one hour per eight hour period. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 1.a will still restrict the conditions under which the reactor coolant and shutdown pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

5. Revised Required Action 3.4.6.C.1 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1." Condition C is applicable in Mode 4 when the required RCS or SDC loops are inoperable or there are no RCS or SDC loops in operation. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.4.6.C.1 will continue to require suspension of operations involving positive reactivity additions if the SDM limit specified in LCO 3.1.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

6. Revised LCO 3.4.7, Note 1.a to state, "No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and". This note is applicable in Mode 5 when the RCS loops are filled, when the SDC pump of the loop in operation is not in operation for \leq one hour per eight hour period. Boron concentrations that

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are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 1.a will still restrict the conditions under which the shutdown cooling pumps may be not in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

7. Revised Required Action 3.4.7.B.1 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1." Condition B is applicable in Mode 5 when the RCS loops are filled, when the required SDC loops are inoperable or there are no SDC loops in operation. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.4.7.B.1 will continue to require suspension of operations involving positive reactivity additions if the SDM limit specified in LCO 3.1.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

8. Revised LCO 3.4.8, Note 1.b to state, "No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and". This note is applicable in Mode 5 with the RCS loops not filled, when all SDC pumps are not in operation for ≤ 15 minutes when switching from one loop to another. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 1.b will still restrict the conditions under which the shutdown cooling pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

9. Revised Required Action 3.4.8.B.1 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1." Condition B is applicable in Mode 5 with the RCS loops not filled, when the required SDC loops are inoperable or there are no SDC loops in operation. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.4.8.B.1 will continue to require suspension of operations involving positive reactivity additions if the SDM limit specified in LCO 3.1.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

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10. Revised Required Action 3.9.2.A.2 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1." Condition A is applicable in Mode 6 when one required source range monitor is inoperable. With only one source range monitor operable, redundancy has been lost. Since these instruments are the only direct means of monitoring core reactivity conditions, boron concentration changes in the RCS must be limited. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.9.2.A.2 will continue to require suspension of operations involving reducing boron concentration if the boron concentration limit specified in LCO 3.9.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

11. Revised LCO 3.9.4, Note 1 to state, "The required SDC loop may be not in operation for ≤ 1 hour per 8 hour period, provided no operations are permitted that could cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1". This note is applicable in Mode 6 with the water level ≥ 23 feet above the top of the irradiated fuel assemblies seated in the reactor vessel. The variance from the LCO conditions permits operations such as core mapping or alterations in the vicinity of the reactor vessel hot leg nozzles. During this one-hour period, decay heat is removed by natural convection to the large mass of water in the refueling pool. Boron concentrations that are not accounted for in the SDM of LCO 3.9.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 1 will still restrict the conditions under which the shutdown cooling pumps may be not in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 (LCO 3.9.4, Note) in wording only and is in conformance with Reference (2).

12. Revised Required Action 3.9.4.A.2 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1." Condition A is applicable in Mode 6 with the water level ≥ 23 feet above the top of the irradiated fuel assemblies seated in the reactor vessel, when one required SDC loop is inoperable or not in operation. If the SDC loop requirements are not met, there will be no forced circulation to provide mixing to establish uniform boron concentrations. Reduced boron concentrations in the RCS can occur through addition of water with a lower boron concentration. Therefore, actions that reduce boron concentration in the RCS are restricted in order that the minimum allowed concentration will be maintained. Boron concentrations that are not accounted for in the SDM of LCO 3.9.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.9.4.A.2 will continue to require suspension of operations involving reducing boron concentration if the boron concentration limit specified in LCO 3.9.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 (LCO 3.9.4.A.1) in wording only and is in conformance with Reference (2).

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13. Revised Required Action 3.9.5.B.1 to state, "Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1." Condition B is applicable in Mode 6 with the water level < 23 feet above the top of the irradiated fuel assemblies seated in the reactor vessel, when no SDC loop is operable or in operation. If the SDC loop requirements are not met, there will be no forced circulation to provide mixing to establish uniform boron concentrations. Reduced boron concentrations in the RCS can occur through addition of water with a lower boron concentration. Therefore, actions that reduce boron concentration in the RCS are restricted in order that the minimum allowed concentration will be maintained. The proposed change will allow boron concentration fluctuations associated with inventory management.

Required Action 3.9.5.B.1 will continue to require suspension of operations involving reducing boron concentration if the boron concentration limit specified in LCO 3.9.1 is adversely affected. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change varies from TSTF-286, Revision 2 in wording only and is in conformance with Reference (2).

Changes that are Plant Specific:

14. Revised LCO 3.4.17, Note b to state, "No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; ". This note is applicable in Modes 4 and 5. The note allows suspending the reactor coolant circulation requirements of LCO 3.4.6, LCO 3.4.7, and LCO 3.4.8 to conduct local leak rate testing on Containment Penetration 41 or to permit maintenance on the valves in the SDC common suction line. Containment Penetration 41 local leak rate test consists of pressurizing the SDC return line between the containment penetration isolation valves, a process that requires the SDC loop to be shut down. Likewise, maintenance on the suction piping or valves common to both SDC loops requires the SDC system to be shut down. This LCO is a special test exception that is allowed even though there is no bounding safety analysis. The tests or maintenance are allowed since they are performed under close supervision during the test program and must stay within the requirements of the LCO. Boron concentrations that are not accounted for in the SDM of LCO 3.1.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note b will still restrict the conditions under which the shutdown cooling pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit the changes in boron concentration. This change is in addition to the changes described in TSTF-286, Revision 2 because this paragraph is plant specific and therefore not part of NUREG 1432, Revision 2.

15. Revised LCO 3.9.4, Note 2.a to state, "no operations are permitted that could cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1". This note is applicable in Mode 6 with the water level \geq 23 feet above the top of the irradiated fuel assemblies seated in the reactor vessel. The note allows removing shutdown cooling pumps from operation to conduct local leak rate testing on Containment Penetration 41 or to permit maintenance on the valves in the SDC common suction line. Containment Penetration 41 local leak rate test consists of pressurizing the SDC return line between the containment penetration isolation valves, a process that requires the SDC loop to be shut down. Likewise, maintenance on the suction piping or valves common to both SDC pumps requires the SDC system to be shut down. If the SDC pump requirements are not met, there will be no forced

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circulation to provide mixing to establish uniform boron concentrations. Reduced boron concentrations in the RCS can occur through addition of water with a lower boron concentration. Therefore, actions that reduce boron concentration in the RCS are restricted in order that the minimum allowed concentration will be maintained. Boron concentrations that are not accounted for in the SDM of LCO 3.9.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 2.a will still restrict the conditions under which the shutdown cooling pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change is in addition to the changes described in TSTF-286, Revision 2 because this paragraph is plant-specific and therefore not part of NUREG 1432, Revision 2.

16. Revised LCO 3.9.5, Note 3.b to state, "No operations are permitted that could cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1." This note is applicable in Mode 6 with the water level < 23 feet above the top of the irradiated fuel assemblies seated in the reactor vessel. The note allows removing SDC pumps from operation to switch from one SDC loop to another. If the SDC pump requirements are not met, there will be no forced circulation to provide mixing to establish uniform boron concentrations. Reduced boron concentrations in the RCS can occur through addition of water with a lower boron concentration. Therefore, actions that reduce boron concentration in the RCS are restricted in order that the minimum allowed concentration will be maintained. Boron concentrations that are not accounted for in the SDM of LCO 3.9.1 will not be allowed so that, when circulation is re-established, SDM in the system will not be adversely affected. The proposed note will allow boron concentration fluctuations associated with inventory management.

Note 3.b will still restrict the conditions under which the shutdown cooling pumps may not be in operation. Therefore this proposed change simply clarifies that the intent of the required action is to limit changes in boron concentration. This change is in addition to the changes described in TSTF-286, Revision 2 because this paragraph is plant-specific and therefore not part of NUREG 1432, Revision 2.

Changes matching TSTF-286:

17. Revised Required Action 3.8.2.A.2.3 to state, "Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration." Condition A is applicable in Modes 5 and 6 during movement of irradiated fuel assemblies, when one required offsite electrical circuit is inoperable. With the offsite circuit not available to all required trains, the option would exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made in the required action, including limiting positive reactivity additions. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

Required Action 3.8.2.A.2.3 will still continue to require suspension of operations involving positive reactivity additions if the required SDM or boron concentration is adversely affected. Additionally, the Technical Specification Basis for this required action states that maintaining or increasing reactor vessel inventory under these conditions is not precluded as long as the required SDM is maintained.

ATTACHMENT (1)

DISCUSSION AND ANALYSIS OF THE PROPOSED CHANGES

Therefore the proposed change simply clarifies that the intent of the required action is to limit positive reactivity additions. This change conforms to TSTF-286, Revision 2.

18. Revised Required Action 3.8.2.B.3 to state, "Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration." Condition B is applicable in Modes 5 and 6 during movement of irradiated fuel assemblies, when one required emergency diesel generator is inoperable. With the required emergency diesel generator inoperable, the minimum required diversity of AC power sources is not available, therefore, allowance for sufficiently conservative actions is made in the required action, including limiting positive reactivity additions. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

Required Action 3.8.2.B.3 will still continue to require suspension of operations involving positive reactivity additions if the required SDM or boron concentration is adversely affected. Additionally, the Technical Specification Basis for this required action states that maintaining or increasing reactor vessel inventory under these conditions is not precluded as long as the required SDM is maintained. Therefore the proposed change simply clarifies that the intent of the required action is to limit positive reactivity additions. This change conforms to TSTF-286, Revision 2.

19. Revised Required Action 3.8.5.A.2.3 to state, "Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration." Condition A is applicable in Modes 5 and 6 during movement of irradiated fuel assemblies, when one or more required DC channels are inoperable. With one or more required DC channels inoperable, the option would exist to declare all associated required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made in the required action, including limiting positive reactivity additions. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

Required Action 3.8.5.A.2.3 will still continue to require suspension of operations involving positive reactivity additions if the required SDM or boron concentration is adversely affected. Additionally, the Technical Specification Basis for this required action states that maintaining or increasing reactor vessel inventory under these conditions is not precluded as long as the required SDM is maintained. Therefore the proposed change simply clarifies that the intent of the required action is to limit positive reactivity additions. This change conforms to TSTF-286, Revision 2.

20. Revised Required Action 3.8.8.A.2.3 to state, "Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration." Condition A is applicable in Modes 5 and 6 during movement of irradiated fuel assemblies, when one or more required inverters is inoperable. With one or more required inverters inoperable, the option would exist to declare all associated required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made in the required action, including limiting positive reactivity additions. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

Required Action 3.8.8.A.2.3 will still continue to require suspension of operations involving positive reactivity additions if the required SDM or boron concentration is adversely affected. Additionally, the Technical Specification Basis for this required action states that maintaining or increasing reactor vessel inventory under these conditions is not precluded as long as the required SDM is maintained.

ATTACHMENT (1)

DISCUSSION AND ANALYSIS OF THE PROPOSED CHANGES

Therefore the proposed change simply clarifies that the intent of the required action is to limit positive reactivity additions. This change conforms to TSTF-286, Revision 2.

21. Revised Required Action 3.8.10.A.2.3 to state, "Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration." Condition A is applicable in Modes 5 and 6 during movement of irradiated fuel assemblies, when one or more required AC, DC, or AC vital bus electrical power distribution subsystems are inoperable. With one or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable, the option would exist to declare all associated required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made in the required action, including limiting positive reactivity additions. The proposed change will allow limited temperature changes or boron concentration fluctuations associated with RCS temperature control or inventory management.

Required Action 3.8.10.A.2.3 will still continue to require suspension of operations involving positive reactivity additions if the required SDM or boron concentration is adversely affected. Therefore the proposed change simply clarifies that the intent of the required action is to limit positive reactivity changes. This change conforms to TSTF-286, Revision 2.

CONCLUSION

As discussed above, the proposed changes are based on TSTF-286, Revision 2. These changes revise actions that either require suspension of operations involving positive reactivity additions, or preclude reduction in boron to a concentration less than that of the RCS. The proposed changes limit the introduction into the RCS of reactivity more positive than that required to meet the required SDM or refueling boron concentrations, as applicable. The operational flexibility allowed in these proposed license amendments will be performed under administrative controls in order to limit the potential for excess positive reactivity additions. Therefore, the proposed changes are deemed safe and acceptable.

REFERENCES:

- (1) Industry/TSTF Standard Technical Specification Change Traveler TSTF-286, Revision 2, Define "Operations Involving Positive Reactivity Changes"
- (2) Memorandum from J. N. Donohew (NRC) to R. A. Gramm (NRC), dated May 16, 2003, Comanche Peak Steam Electric Station, Units 1 and 2 – Licensee's Agreement to Revised Wording in Proposed License Amendment Involving Positive Reactivity Additions (TAC Nos. MB6890 and MB6891)

ATTACHMENT (2)

TECHNICAL SPECIFICATION MARKED-UP PAGES

Wide Range Logarithmic Neutron Flux Monitor Channels
3.3.12

3.3 INSTRUMENTATION

3.3.12 Wide Range Logarithmic Neutron Flux Monitor Channels

LC0 3.3.12 Two channels of wide range logarithmic neutron flux monitoring instrumentation shall be OPERABLE.

APPLICABILITY: MODES 3, 4, and 5, with the reactor trip circuit breakers open or Control Element Assembly Drive System not capable of Control Element Assembly withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable. <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">Insert 1</div>	A.1 <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block;">Suspend all operations involving positive reactivity additions.</div>	Immediately
	AND A.2 Perform SDM verification in accordance with SR 3.1.1.1.	4 hours AND Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.12.1 Perform CHANNEL CHECK.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops - MODE 3

LCO 3.4.5 Two RCS loops shall be OPERABLE and one RCS loop shall be in operation.

----- NOTES -----

1. All reactor coolant pumps may be not in operation for ≤ 1 hour per 8 hour period and ≤ 2 hours per 8 hour period for low flow testing, provided:

a. ~~No operations are permitted that would cause reduction of the RCS boron concentration; and~~

Insert 5

b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^\circ\text{F}$ (Unit 1), $\leq 301^\circ\text{F}$ (Unit 2) unless:

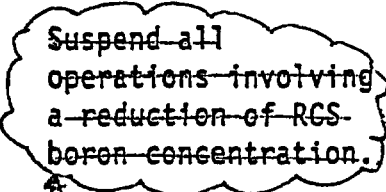
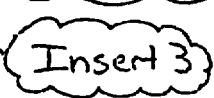
a. The pressurizer water level is ≤ 170 inches;

b. The pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and

c. The secondary water temperature of each steam generator is $\leq 30^\circ\text{F}$ above the RCS temperature.

APPLICABILITY: MODE 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RCS loop inoperable.	A.1 Restore required RCS loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 4.	12 hours
C. No RCS loop OPERABLE. <u>OR</u> No RCS loop in operation.	C.1  <u>AND</u> C.2  Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.5.1 Verify required RCS loop is in operation.	12 hours
SR 3.4.5.2 Verify secondary side water level in each steam generator > -50 inches.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops - MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and shutdown cooling (SDC) loops shall be OPERABLE and at least one loop shall be in operation.

----- NOTES -----

1. All reactor coolant pumps and SDC pumps may be not in operation for ≤ 1 hour per 8 hour period, provided:

a. ~~No operations are permitted that would cause reduction of the RCS boron concentration; and~~

Insert 5

b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^{\circ}\text{F}$ (Unit 1), $\leq 301^{\circ}\text{F}$ (Unit 2) unless:

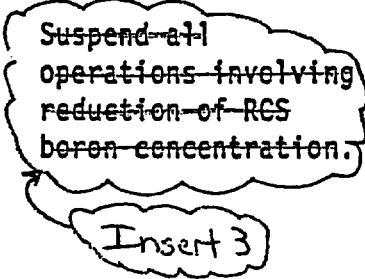
a. Pressurizer water level is ≤ 170 inches;

b. Pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and

c. Secondary side water temperature in each steam generator is $\leq 30^{\circ}\text{F}$ above the RCS temperature.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One required RCS loop inoperable.</p> <p><u>AND</u></p> <p>Two SDC loops inoperable.</p>	<p>A.1 Initiate action to restore a second loop to OPERABLE status.</p>	<p>Immediately</p>
<p>B. One required SDC loop inoperable.</p> <p><u>AND</u></p> <p>Two required RCS loops inoperable.</p>	<p>B.1 Be in MODE 5.</p>	<p>24 hours</p>
<p>C. Required RCS or SDC loops inoperable.</p> <p><u>OR</u></p> <p>No RCS or SDC loops in operation.</p>	<p>C.1  <u>AND</u></p> <p>C.2 Initiate action to restore one loop to OPERABLE status and operation.</p>	<p>Immediately</p> <p>Immediately</p>

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7 One shutdown cooling (SDC) loop shall be OPERABLE and in operation, and either:

- a. One additional SDC loop shall be OPERABLE; or
- b. The secondary side water level of each steam generator (SG) shall be ≥ -50 inches.

----- NOTES -----

1. The SDC pump of the loop in operation may be not in operation for ≤ 1 hour per 8 hour period provided:

a. ~~No operations are permitted that would cause reduction of the RCS boron concentration; and~~

Insert 5

b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. One required SDC loop may be inoperable for up to 2 hours for surveillance testing provided that the other SDC loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^{\circ}\text{F}$ (Unit 1), $\leq 301^{\circ}\text{F}$ (Unit 2) unless:

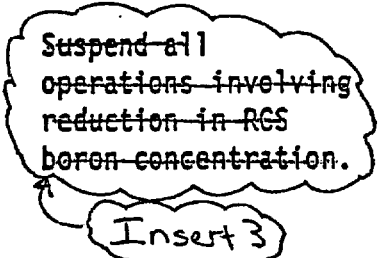
- a. The pressurizer water level is ≤ 170 inches;
- b. Pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and
- c. The secondary side water temperature in each SG is $\leq 30^{\circ}\text{F}$ above the RCS temperature.

4. All SDC loops may be not in operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

RCS Loops - MODE 5, Loops Filled
3.4.7

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable. <u>AND</u> Any SG with secondary side water level not within limit.	A.1 Initiate action to restore a second SDC loop to OPERABLE status.	Immediately
	<u>OR</u> A.2 Initiate action to restore SG secondary side water levels to within limits.	Immediately
B. Required SDC loops inoperable. <u>OR</u> No SDC loop in operation.	B.1 	Immediately
	<u>AND</u> B.2 Initiate action to restore one SDC loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR-3.4.7.1 Verify one SDC loop is in operation.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops - MODE 5, Loops Not Filled

LCO 3.4.8 Two shutdown cooling (SDC) loops shall be OPERABLE and one SDC loop shall be in operation.

----- NOTES -----

1. All SDC pumps may be not in operation for ≤ 15 minutes when switching from one loop to another provided:
 - a. The core outlet temperature is maintained at least 10°F below saturation temperature;
 - b. ~~No operations are permitted that would cause a reduction of the RCS boron concentration; and~~
 - c. No draining operations to further reduce the RCS water volume are permitted.
2. One SDC loop may be inoperable for ≤ 2 hours for surveillance testing provided the other SDC loop is OPERABLE and in operation.

Insert 5

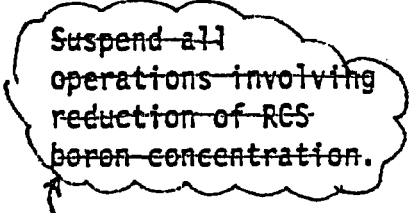
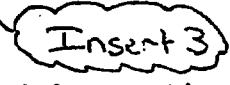
APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable.	A.1 Initiate action to restore SDC loop to OPERABLE status.	Immediately

RCS Loops - MODE 5, Loops Not Filled
3.4.8

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required SDC loops inoperable. <u>OR</u> No SDC loop in operation.	B.1 	Immediately
	<u>AND</u> B.2  Initiate action to restore one SDC loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.8.1 Verify one SDC loop is in operation.	12 hours
SR 3.4.8.2 Verify correct breaker alignment and indicated power available to the required SDC loop components that are not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 Special Test Exception (STE) RCS Loops - MODES 4 and 5

LCO 3.4.17 The reactor coolant circulation requirements of LCO 3.4.6, "RCS Loops-MODE 4," LCO 3.4.7, "RCS Loops-MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops-MODE 5, Loops Not Filled" may be suspended during the time intervals required: 1) for local leak rate testing of containment penetration number 41 pursuant to the requirements of the Containment Leakage Rate Testing Program; and 2) to permit maintenance on valves located in the common shutdown cooling suction line or on the shutdown cooling flow control valve (CV-306) provided:

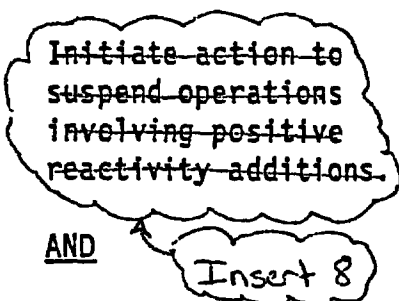
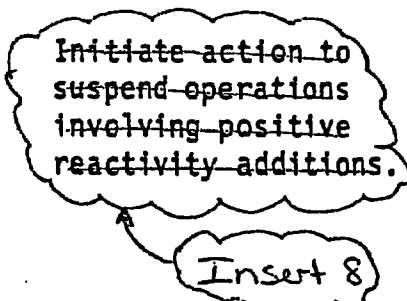
- a. Xenon reactivity is $\leq 0.1\% \Delta k/k$ and is approaching stability;
- b. No operations are permitted which could cause ~~reduction~~ of the RCS boron concentration; *with* *Insert 7* *introduction of coolant into*
- c. The charging pumps are deenergized and the charging flow paths are closed; and
- d. The SDM requirement of LCO 3.1.1 is verified every 8 hours.

APPLICABILITY: MODES 4 and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more requirements of the Limiting Condition for Operation not met.	A.1 Suspend activities being performed under this Special Test Exception.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (Continued)	A.2.3 Initiate action to suspend operations involving positive reactivity additions. <u>AND</u> 	Immediately
	A.2.4 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS. <u>AND</u>	Immediately
	B.2 Suspend movement of irradiated fuel assemblies. <u>AND</u>	Immediately
	B.3 Initiate action to suspend operations involving positive reactivity additions. <u>AND</u> 	Immediately
	B.4 Initiate action to restore required DG to OPERABLE status.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

Inverters-Shutdown
3.8.8

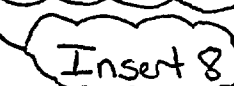
ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<p>AND <i>Insert 8</i></p> <p>A.2.4 Initiate action to restore required inverters to OPERABLE status.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.8.1 Verify correct inverter voltage and alignment to required AC vital buses.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions	Immediately
	<u>AND</u> 	
	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

3.9 REFUELING OPERATIONS

3.9.2 Nuclear Instrumentation

LC0 3.9.2 Two source range monitors (SRMs) shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SRM inoperable.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u> A.2 Suspend positive reactivity additions.	Immediately <u>Insert 4</u>
B. Two required SRMs inoperable.	B.1 Initiate action to restore one SRM to OPERABLE status.	Immediately
	<u>AND</u> B.2 Perform SR 3.9.1.1.	Once per 12 hours

3.9 REFUELING OPERATIONS

3.9.4 Shutdown Cooling (SDC) and Coolant Circulation-High Water Level

LCO 3.9.4 One SDC loop shall be OPERABLE and in operation.

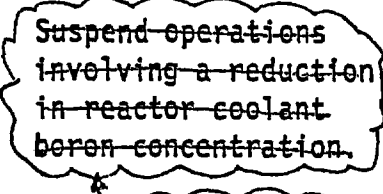
----- NOTES -----

1. The required SDC loop may be not in operation for ≤ 1 hour per 8 hour period, provided no operations are permitted that would cause ~~reduction of the Reactor Coolant System boron concentration.~~ *With* *Insert ?* *introduction of coolant into*
2. The shutdown cooling pumps may be removed from operation during the time required for local leak rate testing of containment penetration number 41 pursuant to the requirements of SR 3.6.1.1 or to permit maintenance on valves located in the common SDC suction line, provided:
 - a. no operations are permitted that would cause ~~a reduction to Reactor Coolant System boron concentration.~~ *With* *introduction of coolant into* *Insert ?*
 - b. CORE ALTERATIONS are suspended, and
 - c. all containment penetrations are in the status described in LCO 3.9.3.

APPLICABILITY: MODE 6 with the water level ≥ 23 ft above the top of the irradiated fuel assemblies seated in the reactor vessel.

SDC and Coolant Circulation-High Water Level
3.9.4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SDC loop inoperable or not in operation.	A.1 Initiate action to restore SDC loop to OPERABLE status and operation.	Immediately
	<u>AND</u>	
	A.2  Suspend operations involving a reduction in reactor coolant boron concentration.	Immediately
	<u>AND</u>	
	A.3 Suspend loading of irradiated fuel assemblies in the core.	Immediately
	<u>AND</u>	
	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

3.9 REFUELING OPERATIONS

3.9.5 Shutdown Cooling (SDC) and Coolant Circulation-Low Water Level

LCO 3.9.5 Two SDC loops shall be OPERABLE, and one SDC loop shall be in operation.

----- NOTES -----

1. One SDC loop may be replaced by one spent fuel pool cooling loop provided it is lined up to provide cooling flow to irradiated fuel in the reactor core and the core heat generation rate is less than the heat removal capacity of the spent fuel cooling loop.
2. One required SDC loop may be inoperable for up to 2 hours for surveillance testing, provided that the other SDC loop is OPERABLE and in operation.
3. All SDC pumps may be de-energized for ≤ 15 minutes when switching from one train to another provided:

- a. The core outlet temperature is maintained $> 10^{\circ}\text{F}$ below saturation temperature;

introduction of coolant into ~~reduction of~~ No operations are permitted that would cause ~~a~~ the Reactor Coolant System boron concentration; and ~~with~~ Insert ?

- c. No draining operations to further reduce Reactor Coolant System water volume are permitted.

APPLICABILITY: MODE 6 with the water level < 23 ft above the top of the irradiated fuel assemblies seated in the reactor vessel.

SDC and Coolant Circulation-Low Water Level
3.9.5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable.	A.1 Initiate action to restore SDC loop to OPERABLE status.	Immediately
	<u>OR</u> A.2 Initiate action to establish ≥ 23 ft of water above the top of irradiated fuel assemblies seated in the reactor vessel.	Immediately
B. No SDC loop OPERABLE or in operation.	B.1 <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block;">Suspend operations involving a reduction in reactor coolant boron concentration.</div>	Immediately
	<u>AND</u> B.2 Initiate action to restore one SDC loop to OPERABLE status and to operation.	Immediately
	<u>AND</u> B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

- Insert 1** **Suspend all operations that involve positive reactivity additions that are not accounted for in the calculated SDM.**
- Insert 3** **Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1**
- Insert 4** **Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1**
- Insert 5** **No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and**
- Insert 7** **could cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1.**
- Insert 8** **Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.**

ATTACHMENT (3)

FINAL TECHNICAL SPECIFICATION PAGES

Wide Range Logarithmic Neutron Flux Monitor Channels
3.3.12

3.3 INSTRUMENTATION

3.3.12 Wide Range Logarithmic Neutron Flux Monitor Channels

LCO 3.3.12 Two channels of wide range logarithmic neutron flux monitoring instrumentation shall be OPERABLE.

APPLICABILITY: MODES 3, 4, and 5, with the reactor trip circuit breakers open or Control Element Assembly Drive System not capable of Control Element Assembly withdrawal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Suspend all operations that involve positive reactivity additions that are not accounted for in the calculated SDM.	Immediately
	<u>AND</u>	
	A.2 Perform SDM verification in accordance with SR 3.1.1.1.	4 hours <u>AND</u> Once per 12 hours thereafter

Wide Range Logarithmic Neutron Flux Monitor Channels
3.3.12

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.12.2	Perform CHANNEL FUNCTIONAL TEST.	Once within 7 days prior to each reactor startup
SR 3.3.12.3	<p>-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. -----</p> <p>Perform CHANNEL CALIBRATION.</p>	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops - MODE 3

LCO 3.4.5 Two RCS loops shall be OPERABLE and one RCS loop shall be in operation.

----- NOTES-----

1. All reactor coolant pumps may be not in operation for ≤ 1 hour per 8 hour period and ≤ 2 hours per 8 hour period for low flow testing, provided:
 - a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and
 - b. Core outlet temperature is maintained at least 10°F below saturation temperature.
2. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^{\circ}\text{F}$ (Unit 1), $\leq 301^{\circ}\text{F}$ (Unit 2) unless:
 - a. The pressurizer water level is ≤ 170 inches;
 - b. The pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and
 - c. The secondary water temperature of each steam generator is $\leq 30^{\circ}\text{F}$ above the RCS temperature.

APPLICABILITY: MODE 3.

ACTIONS

[illegible]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loop is in operation.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify secondary side water level in each steam generator > -50 inches.	12 hours
SR 3.4.5.3	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops - MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and shutdown cooling (SDC) loops shall be OPERABLE and at least one loop shall be in operation.

----- NOTES-----

1. All reactor coolant pumps and SDC pumps may be not in operation for ≤ 1 hour per 8 hour period, provided:
 - a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and
 - b. Core outlet temperature is maintained at least 10°F below saturation temperature.
2. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^{\circ}\text{F}$ (Unit 1), $\leq 301^{\circ}\text{F}$ (Unit 2) unless:
 - a. Pressurizer water level is ≤ 170 inches;
 - b. Pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and
 - c. Secondary side water temperature in each steam generator is $\leq 30^{\circ}\text{F}$ above the RCS temperature.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One required RCS loop inoperable.</p> <p><u>AND</u></p> <p>Two SDC loops inoperable.</p>	<p>A.1 Initiate action to restore a second loop to OPERABLE status.</p>	<p>Immediately</p>
<p>B. One required SDC loop inoperable.</p> <p><u>AND</u></p> <p>Two required RCS loops inoperable.</p>	<p>B.1 Be in MODE 5.</p>	<p>24 hours</p>
<p>C. Required RCS or SDC loops inoperable.</p> <p><u>OR</u></p> <p>No RCS or SDC loops in operation.</p>	<p>C.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1.</p> <p><u>AND</u></p> <p>C.2 Initiate action to restore one loop to OPERABLE status and operation.</p>	<p>Immediately</p> <p>Immediately</p>

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7 One shutdown cooling (SDC) loop shall be OPERABLE and in operation, and either:

- a. One additional SDC loop shall be OPERABLE; or
- b. The secondary side water level of each steam generator (SG) shall be ≥ -50 inches.

----- NOTES -----

1. The SDC pump of the loop in operation may be not in operation for ≤ 1 hour per 8 hour period provided:
 - a. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and
 - b. Core outlet temperature is maintained at least 10°F below saturation temperature.
2. One required SDC loop may be inoperable for up to 2 hours for surveillance testing provided that the other SDC loop is OPERABLE and in operation.
3. No reactor coolant pump shall be started with any RCS cold leg temperature $\leq 365^{\circ}\text{F}$ (Unit 1), $\leq 301^{\circ}\text{F}$ (Unit 2) unless:
 - a. The pressurizer water level is ≤ 170 inches;
 - b. Pressurizer pressure is ≤ 300 psia (Unit 1), ≤ 320 psia (Unit 2); and
 - c. The secondary side water temperature in each SG is $\leq 30^{\circ}\text{F}$ above the RCS temperature.

4. All SDC loops may be not in operation during planned heatup to MODE 4 when at least one RCS loop is in operation.
-

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One SDC loop inoperable.</p> <p><u>AND</u></p> <p>Any SG with secondary side water level not within limit.</p>	<p>A.1 Initiate action to restore a second SDC loop to OPERABLE status.</p>	Immediately
	<p><u>OR</u></p> <p>A.2 Initiate action to restore SG secondary side water levels to within limits.</p>	Immediately
<p>B. Required SDC loops inoperable.</p> <p><u>OR</u></p> <p>No SDC loop in operation.</p>	<p>B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1.</p>	Immediately
	<p><u>AND</u></p> <p>B.2 Initiate action to restore one SDC loop to OPERABLE status and operation.</p>	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one SDC loop is in operation.	12 hours
SR 3.4.7.2	Verify required SG secondary side water level is > -50 inches.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required SDC loop components that are not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops - MODE 5, Loops Not Filled

LCO 3.4.8 Two shutdown cooling (SDC) loops shall be OPERABLE and one SDC loop shall be in operation.

----- NOTES-----

1. All SDC pumps may be not in operation for ≤ 15 minutes when switching from one loop to another provided:
 - a. The core outlet temperature is maintained at least 10°F below saturation temperature;
 - b. No operations are permitted that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1; and
 - c. No draining operations to further reduce the RCS water volume are permitted.
 2. One SDC loop may be inoperable for ≤ 2 hours for surveillance testing provided the other SDC loop is OPERABLE and in operation.
-

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable.	A.1 Initiate action to restore SDC loop to OPERABLE status.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required SDC loops inoperable. <u>OR</u> No SDC loop in operation.	B.1 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the SDM of LCO 3.1.1.	Immediately
	<u>AND</u> B.2 Initiate action to restore one SDC loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.8.1 Verify one SDC loop is in operation.	12 hours
SR 3.4.8.2 Verify correct breaker alignment and indicated power available to the required SDC loop components that are not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 Special Test Exception (STE) RCS Loops - MODES 4 and 5

LCO 3.4.17 The reactor coolant circulation requirements of LCO 3.4.6, "RCS Loops-MODE 4," LCO 3.4.7, "RCS Loops-MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops-MODE 5, Loops Not Filled" may be suspended during the time intervals required: 1) for local leak rate testing of containment penetration number 41 pursuant to the requirements of the Containment Leakage Rate Testing Program; and 2) to permit maintenance on valves located in the common shutdown cooling suction line or on the shutdown cooling flow control valve (CV-306) provided:

- a. Xenon reactivity is $\leq 0.1\% \Delta k/k$ and is approaching stability;
- b. No operations are permitted which could cause introduction of coolant into the RCS with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1;
- c. The charging pumps are deenergized and the charging flow paths are closed; and
- d. The SDM requirement of LCO 3.1.1 is verified every 8 hours.

APPLICABILITY: MODES 4 and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more requirements of the Limiting Condition for Operation not met.	A.1 Suspend activities being performed under this Special Test Exception.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.17.1 Verify xenon reactivity is within limits.	Once within 1 hour prior to suspending the reactor coolant circulation requirements of LCO 3.4.6, LCO 3.4.7, and LCO 3.4.8
SR 3.4.17.2 Verify charging pumps de-energized.	1 hour
SR 3.4.17.3 Verify charging flow paths isolated.	1 hour
SR 3.4.17.4 Perform SR 3.1.1.1.	8 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (Continued)	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. <u>AND</u>	Immediately
	A.2.4 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately
B. One required DG inoperable.	B.1 Suspend CORE ALTERATIONS. <u>AND</u>	Immediately
	B.2 Suspend movement of irradiated fuel assemblies. <u>AND</u>	Immediately
	B.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. <u>AND</u>	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (Continued)	B.4 Initiate action to restore required DG to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.2.1 -----NOTE----- The following Surveillance Requirements (SRs) are not required to be performed: SR 3.8.1.11, SR 3.8.1.12, and SR 3.8.1.14. -----</p> <p>For the LCO 3.8.2.a and LCO 3.8.2.b AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources-Operating," except SR 3.8.1.4, SR 3.8.1.8, SR 3.8.1.10, SR 3.8.1.13, 3.8.1.15, and SR 3.8.1.16, are applicable.</p>	In accordance with applicable SRs
<p>SR 3.8.2.2 For the LCO 3.8.2.c and LCO 3.8.2.d AC sources required to be OPERABLE, the SRs required by SR 3.8.1.16, are applicable.</p>	In accordance with applicable SRs

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

Inverters-Shutdown
3.8.8

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u> A.2.4 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.8.1 Verify correct inverter voltage and alignment to required AC vital buses.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

3.9 REFUELING OPERATIONS

3.9.2 Nuclear Instrumentation

LC0 3.9.2 Two source range monitors (SRMs) shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SRM inoperable.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u> A.2 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LC0 3.9.1.	Immediately
B. Two required SRMs inoperable.	B.1 Initiate action to restore one SRM to OPERABLE status.	Immediately
	<u>AND</u> B.2 Perform SR 3.9.1.1.	Once per 12 hours

3.9 REFUELING OPERATIONS

3.9.4 Shutdown Cooling (SDC) and Coolant Circulation-High Water Level

LCO 3.9.4 One SDC loop shall be OPERABLE and in operation.

----- NOTES-----

1. The required SDC loop may be not in operation for ≤ 1 hour per 8 hour period, provided no operations are permitted that would cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1.
2. The shutdown cooling pumps may be removed from operation during the time required for local leak rate testing of containment penetration number 41 pursuant to the requirements of SR 3.6.1.1 or to permit maintenance on valves located in the common SDC suction line, provided:
 - a. no operations are permitted that would cause introduction of coolant into Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1,
 - b. CORE ALTERATIONS are suspended, and
 - c. all containment penetrations are in the status described in LCO 3.9.3.

APPLICABILITY: MODE 6 with the water level ≥ 23 ft above the top of the irradiated fuel assemblies seated in the reactor vessel.

SDC and Coolant Circulation-High Water Level
3.9.4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SDC loop inoperable or not in operation.	A.1 Initiate action to restore SDC loop to OPERABLE status and operation.	Immediately
	<u>AND</u>	
	A.2 Suspend operations that could cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
	<u>AND</u>	Immediately
	A.3 Suspend loading of irradiated fuel assemblies in the core.	4 hours
	<u>AND</u>	
	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	

3.9 REFUELING OPERATIONS

3.9.5 Shutdown Cooling (SDC) and Coolant Circulation-Low Water Level

LCO 3.9.5 Two SDC loops shall be OPERABLE, and one SDC loop shall be in operation.

----- NOTES -----

1. One SDC loop may be replaced by one spent fuel pool cooling loop provided it is lined up to provide cooling flow to irradiated fuel in the reactor core and the core heat generation rate is less than the heat removal capacity of the spent fuel cooling loop.
2. One required SDC loop may be inoperable for up to 2 hours for surveillance testing, provided that the other SDC loop is OPERABLE and in operation.
3. All SDC pumps may be de-energized for ≤ 15 minutes when switching from one train to another provided:
 - a. The core outlet temperature is maintained $> 10^{\circ}\text{F}$ below saturation temperature;
 - b. No operations are permitted that would cause introduction of coolant into the Reactor Coolant System with boron concentration less than that required to meet the minimum boron concentration of LCO 3.9.1; and
 - c. No draining operations to further reduce Reactor Coolant System water volume are permitted.

APPLICABILITY: MODE 6 with the water level < 23 ft above the top of the irradiated fuel assemblies seated in the reactor vessel.

SDC and Coolant Circulation-Low Water Level
3.9.5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable.	A.1 Initiate action to restore SDC loop to OPERABLE status.	Immediately
	<u>OR</u> A.2 Initiate action to establish ≥ 23 ft of water above the top of irradiated fuel assemblies seated in the reactor vessel.	Immediately
B. No SDC loop OPERABLE or in operation.	B.1 Suspend operations that would cause introduction of coolant in to the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
	<u>AND</u> B.2 Initiate action to restore one SDC loop to OPERABLE status and to operation.	Immediately
	<u>AND</u>	

SDC and Coolant Circulation-Low Water Level
3.9.5

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (Continued)	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.5.1 Verify required SDC loops are OPERABLE and one SDC loop is in operation.	12 hours
SR 3.9.5.2 Verify SDC loop in operation is circulating reactor coolant at a flow rate of ≥ 1500 gpm.	12 hours
SR 3.9.5.3 Verify correct breaker alignment and indicated power available to the required SDC loop components that are not in operation.	7 days